

NTS and
Environmental
Statement Volume I:

Technical
Assessments Part 1

Nant Llesg Surface Mine

Incorporating Land Remediation



Environmental Statement: Volume I: Technical Assessments

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Non Technical
Summary (NTS)

Nant Llesg Surface Mine

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1.1 Purpose of the Non-Technical Summary

An Environmental Impact Assessment (EIA) is a study that systematically assesses the likely significant effects on the environment of a project. This is a requirement derived from the 'Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (Codification)', as transposed into UK law for Wales by the Town and Country Planning (Environmental Assessment) (England and Wales) Regulations 1999 as amended in Wales (The EIA Regulations) and the results of the EIA are presented within a report known as the Environmental Statement (ES) which is submitted along with the planning application. An ES has been prepared in support of a planning application, submitted by Miller Argent (South Wales) to Caerphilly County Borough Council, which seeks permission to establish a surface mine, including land remediation. This is known as the 'Nant Llesg Surface Mine, Incorporating Land Remediation'.

This report is a non-technical summary (NTS) of the ES, and presents the main findings of the EIA in non-technical language. As such the NTS provides a succinct summary of the large amount of technical data that is available, highlighting the environmental impacts that have been identified and what is being proposed to mitigate them. This NTS summarises the following documents that comprise the ES:

- **Volume I:** Environmental Statement
- **Volume II:** Technical Appendices
- **Volume III:** Drawings

Where further information is required about matters referred to in the NTS, interested parties should consult the ES and its technical appendices/drawings.

1.2 Document availability

All of the ES documents are available for viewing at the following location during normal working hours (09:00 – 17:00 Mon –Fri):

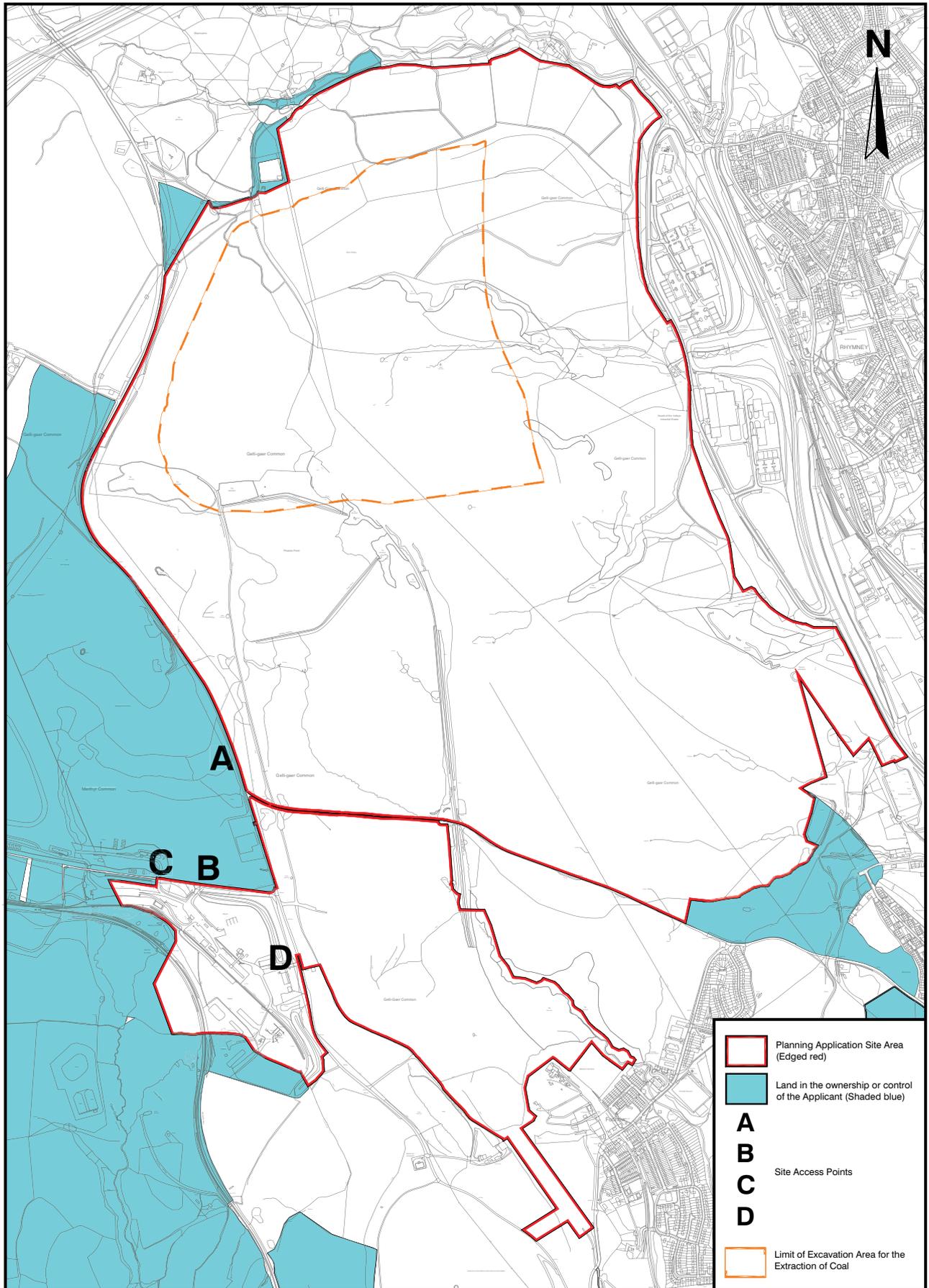
- Miller Argent (South Wales) Limited, Cwmbargoed Disposal Point, Fochriw Road, Merthyr Tydfil, Mid Glamorgan, CF48 4AE (Miller Argent);
- The Council Offices, Planning Division, Pontllanfraith House, Pontllanfraith, Blackwood, NP12 2YW

Hard copies of the ES documents can be purchased from Miller Argent at a cost of £500. DVD copies are also available at a cost of £10 each.

1.3 The Applicant – Miller Argent (South Wales) Limited

Miller Argent is a 50-50 joint venture between The Miller Group Limited and Argent Group PLC. The company was specifically created to carry out the Ffos-y-fran Land Reclamation Scheme (FLRS) in Merthyr Tydfil but it will also operate the proposed scheme. The FLRS project currently provides employment for around 200 people, the majority of whom are local (in excess of 80 per cent live within 15 km of the site).

Miller Argent, together in partnership with local communities, will develop a community investment fund strategy with a specific aim of positively contributing to the sustainable development of the local area. As part of this Miller Argent already funds a number of local community facilities, including two community minibuses and the use of an education and training centre. Miller Argent also contributes to a multi-million pound Community Benefit Fund set up under FLRS which is administered by Merthyr Tydfil County Borough Council (MTCBC).



NTS001 - Planning Application Site Boundary

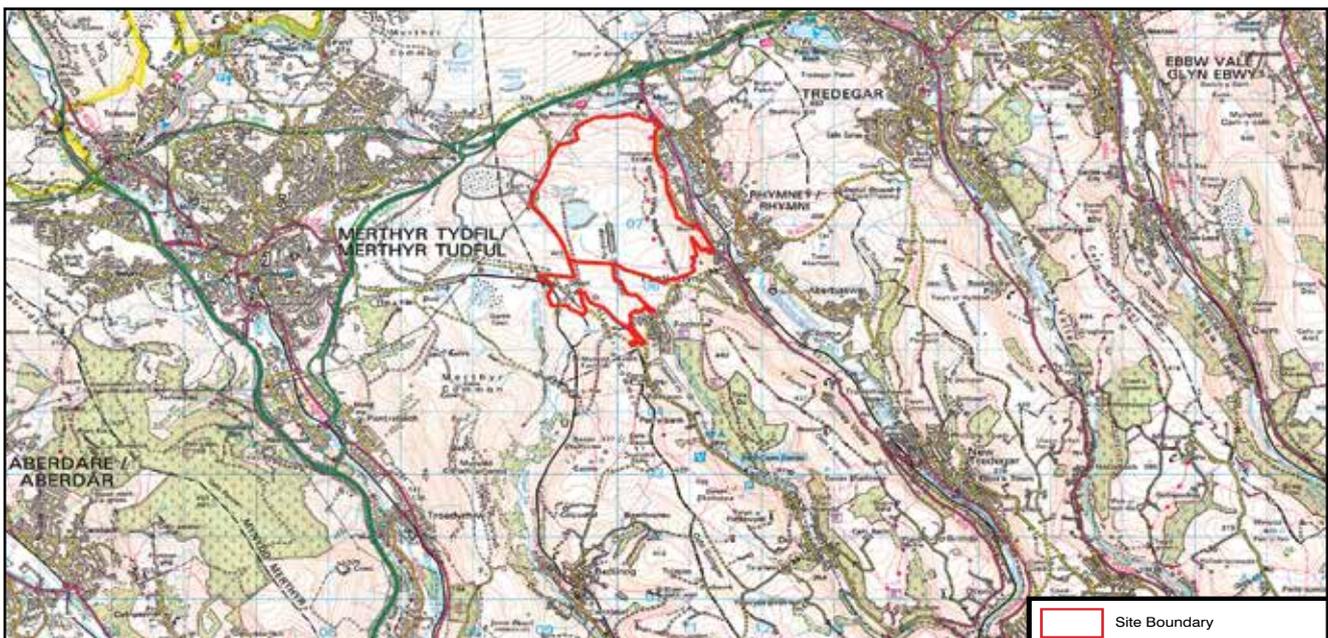
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The planning application site boundary is shown on Figure NTS001 and the general site location is indicated on Figure NTS002. The land included within the planning application site boundary, edged red on Figure NTS001, covers some 478.1ha to the west and south west of Rhymney and to the north and west of Pontlottyn and Fochriw in the County Borough of Caerphilly. It consists primarily of previously mined and industrially disturbed upland urban common land and agricultural grazing land on the western side of the Upper Rhymney Valley area.

Immediately east of the planning application site boundary lie the Heads of the Valleys Industrial Estate and the Capital Valley Eco Park. The roads to the west of the industrial estates mark the western limit of the Rhymney settlement boundary and the residential area of Rhymney lies approximately 300m or so further east. The western application boundary is defined by the unclassified road known as 'Fochriw Road', which runs northwards over the Gelligaer and Merthyr Urban Common from Cwmbargoed towards the A470 Heads of the Valleys Road. The northern extent of the site generally follows the line of the 'Nant Carno' watercourse, which meanders just north of the site boundary. The southern limit of the 'Nant Llesg Surface Mine' is largely defined by South Tunnel Road, which is an unclassified road over the Gelligaer and Merthyr Urban Common that runs east-south-eastwards towards Fochriw and Pontlottyn. Land has been included within the application boundary to the east, west and south of the surface mine for land remediation and road improvement works, as have the coal processing and dispatch facilities at Cwmbargoed Disposal Point.

There are no communities within 500m of the operational boundary although there are a number of isolated properties in the vicinity of the site as shown on Figure NTS003 which identifies the different components of the project.



NTS002 - Site Location

Proposed development

3.1 Overview

The proposed scheme is called the 'Nant Llesg Surface Mine, Incorporating Land Remediation' and covers approximately 478.1 ha of land in the County Borough of Caerphilly (Figure NTS003). It is proposed to mine approximately 6 million tonnes of coal using surface mining methods and to carry out land remediation works within and adjacent to the surface mine to address public safety and land drainage concerns. The scheme incorporates ancillary operations and works, including the progressive restoration of the land followed by a minimum five-year period of aftercare. It also includes proposals for a new coal washing plant and associated water recycling facilities at Cwmbargoed Disposal Point and incorporates an extension of time for the retention of the facilities there, with some amendments to the layout being included to take into account the expiry of existing permissions and the need to restore areas beyond the scope of the proposed scheme in 2024.

3.2 Scheme components

The Nant Llesg scheme incorporates the following development proposals:

Main development - Mineral workings

- **Mineral Workings at the Nant Llesg Surface Coal Mine** to recover approximately 6 million tonnes of coal by surface mining methods; including creation of void space, erection of a visual and acoustic screening bund and an overburden mound, progressive and final restoration, construction, erection and /or installation of all related buildings, plant, structures and other facilities ancillary to mining operations;
- **Coal Washing Plant and Ancillary Water Recycling Facility** at Cwmbargoed Disposal Point for the preparation and processing of coal for the duration of mining operations at the Nant Llesg and Ffos-y-fran surface mines;
- **Continued Use of facilities at Cwmbargoed Disposal Point** for the duration of mining operations at the Nant Llesg Surface Mine and the Ffos-y-fran land reclamation scheme (FLRS);
- **Changes to Cwmbargoed Disposal Point in 2024** to ensure that the facility can continue to operate despite the expiry of existing permissions which lie beyond the scope of the proposed scheme

Associated development

- **Remediation of Old Shafts, Adits and Mining Dereliction** associated with former iron ore and coal mining, including improvements to the quality of mine water discharge into the River Rhymney;
- **Land Remediation to Reduce Silting of Parc Cwm Darran Lake**, involving drainage works on the site of a former colliery tip and tip washing scheme to help address the scouring of tip material into the adjoining watercourse and reduce the build-up of silt at the lake at Darran Valley Country Park;
- **Road Improvement Works at the junction of Fochriw Road and Bogey Road** to improve visibility for traffic using the junction by reducing the vertical alignment of Fochriw Road to the south of the junction; along with the formation of Access Point 'A' to the surface mine and minor improvements to Access Points 'B' and 'C' to Cwmbargoed disposal point (refer to Figure NTS003);
- **Works Associated with Rhaslas Pond** – The archaeological examination and recording of the northern embankment before its removal and the protection of and minor drainage works to the southern embankment; it being considered a prospective Scheduled Monument;
- **Investigate, Treat and/or Remove Waste Materials** from within part of a licenced inert landfill site that currently lies over the coal excavation area;
- **Restoration and Aftercare of the Land**, which includes restoration of the land in accordance with an approved Restoration Strategy and aftercare of the land for a minimum period of five years.

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To facilitate these development proposals it is also necessary that separate applications are submitted and planning obligations undertaken to address the following:

- **Public Rights of Way** - An application to stop up all public rights of way that cross the site, together with an appropriate planning obligation for the creation of a replacement network of rights of way at appropriate times. This would be part of an approved restoration strategy for the land. The impacts will be mitigated by the provision of north south links to the east and west of the site following diversion of power lines (to the west) and during land remediation, following which more permanent rights will be formalised (to the east)
- **Common Land** - An application for consent for the proposed works over the areas of the land that form part of the Gelligaer and Merthyr Urban Common. The impact on common land will be mitigated by the provision of temporary grazing and public access land for the duration of mining operations, restoration and aftercare of the land (Figure NTS004).

Full details of the development scheme are set out in Chapter 3 of the ES.

3.3 Timescales

It is proposed that the site would be worked and restored in a series of stages over a total period of 14 years. This time frame can be broken down into the stages set out in Table NTS1 below:

Stage	Description	Maximum 750,000 Tonnes/Annum
Stage 1	Excavation of Initial Void (Inc. Site Establishment)	Year 1.00 – 4.00
Stage 2	Up to Maximum Void	Year 4.00 – 6.00
Stage 3	Max. Void to Start of Backfilling from Overburden Mound	Year 6.00 – 9.50
Stage 4	Up to End of Coal Excavations	Year 9.50 – 11.00
Stage 5	Backfilling of Final Void and Restoration	Year 11.00 – 14.00

Table NTS1 - Timescales Required to Complete Stages of Operations

Figure NTS005 shows the various stages of the void excavation and progressive restoration.

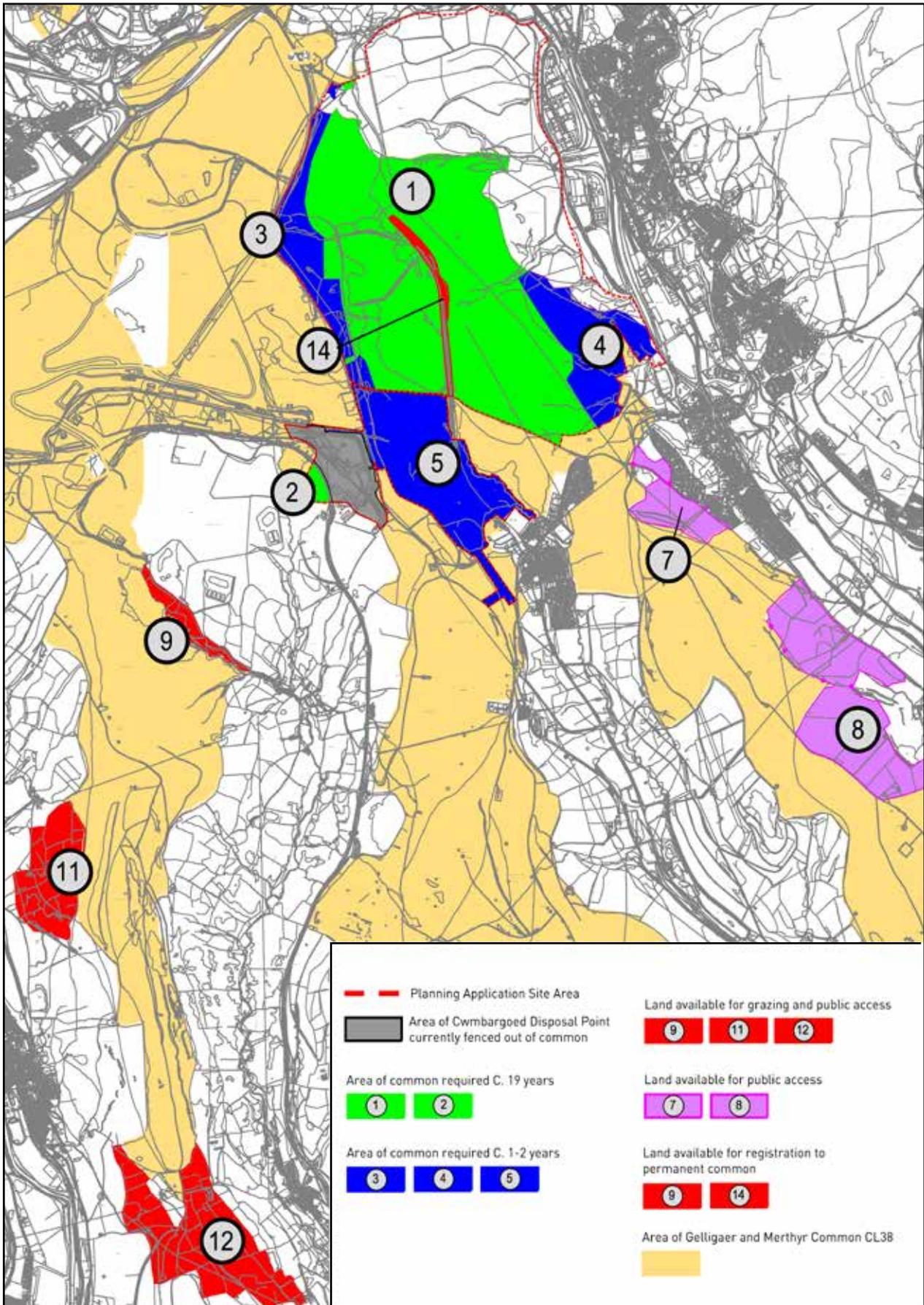
Within 2 years of the commencement of coaling operations it is intended that areas of land outside the operational boundary will be remediated and released back to their existing use. This represents approximately 32% of the total project area.

3.4 Stand-off from Settlement Boundary

The main operational area of the surface mine would be kept at least 500m from the settlement boundaries of Rhymney, Pontlottyn and Fochriw. This distance accords with the Welsh Government's Minerals Technical Advice Note 2: Coal (MTAN2) which states that 'coal working would generally not be acceptable within 500 metres (m) of settlements' notwithstanding that such advice is not incorporated within the Caerphilly Local Development Plan (LDP). Some activities, such as fencing, the erection of a visual and acoustic screening bund and remediation works will take place within 500m of the settlement boundaries, but these are not considered to be coal working and are considered to fall within exceptional circumstances referred to in MTAN2 in any event.

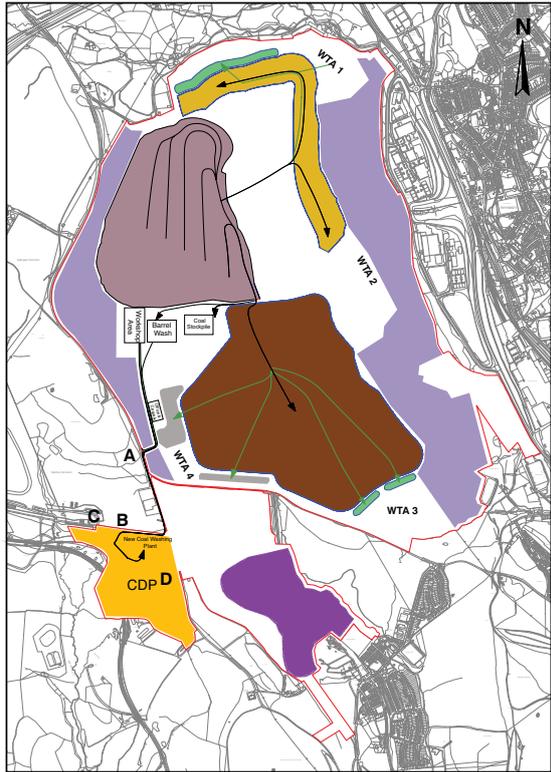
3.5 Direction of mining

The site would be worked in a west to east direction as a series of 'cuts' with the land being progressively backfilled and restored as the excavations progressed eastwards.

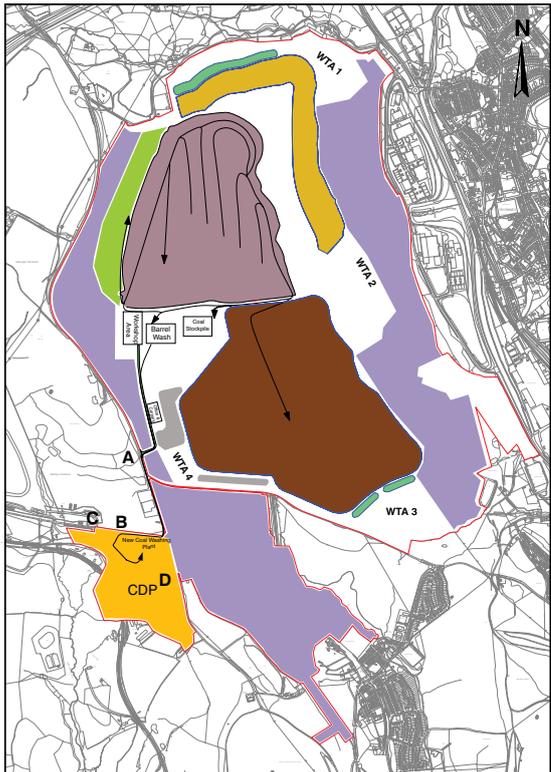


NTS004 - Section 38 Application Areas

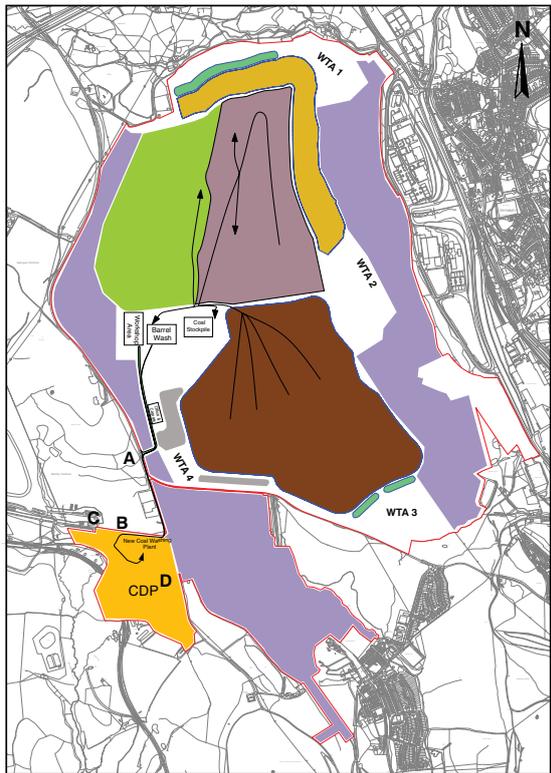
Development of Box Cut - Year 4



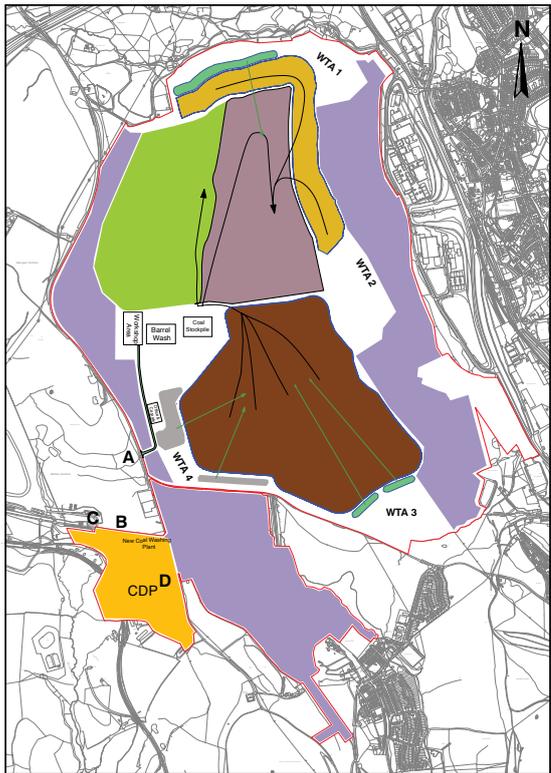
Maximum Void - Year 6



End of Coaling - Year 11



Restoration - Years 11-14



- | | | | |
|---------------------------------|---------------------------------|----------------------------------|--|
| Planning Application Site Area | Overburden storage area | Land remediation works | Peat storage area |
| Cwmbargoed Disposal Point (CDP) | Area of early land remediation | Visual & acoustic screening bund | A-D Access points to site and Cwmbargoed Disposal Point |
| Working area | Area of progressive restoration | Soil storage areas | Haul Route (Coal and Overburden) |
| | | WTA Water treatment area | Haul Route (Soils) |

NTS005 - Sequence of Operational Stages

Proposed development

3.6 Hours of working

The proposed hours of working for the Nant Llesg surface mine are:

- **Weekdays:** 0700 – 1900 hrs
- **Saturdays:** 0700 – 1400 hrs
- **Sundays:** Dust suppression only (water bowsers)
- **Public & Bank Holidays:** Dust suppression only (water bowsers)

The proposed hours for Cwmbargoed Disposal Point are (as per existing permission):

- **Weekdays:** 0600 – 2200 hrs
- **Saturdays:** 0700 – 1800 hrs
- **Sundays:** Dust suppression only (water bowsers)
- **Public & Bank holidays:** Dust suppression only (water bowsers)
- **Train loading and dispatch:** 24 hrs

Blasting would only take place over periods of very short duration between the proposed hours of:

- **Weekdays:** 1000 – 1300 and 1400 – 1600 hrs
- **Saturdays:** 1000 – 1300
- **Sundays:** No blasting
- **Public holidays & bank holidays:** No blasting

3.7 Transportation of coal

It is proposed that up to 750,000 tonnes of coal per annum would be mined from the Nant Llesg Surface Mine. All coal so mined would be taken to Cwmbargoed Disposal Point (CDP) for processing and onward dispatch to market. There is an existing limit of 50,000 tonnes per annum that can be dispatched by road from the CDP. All other coal would be dispatched by rail.

3.8 Employment

The Nant Llesg project would support new local jobs as a result of surface mining operations, land remediation, and supplier spending over the 10 year coaling period.

The economic benefits of the Nant Llesg scheme include:

- Direct employment: Between 144 and 239 jobs (dependent upon shift pattern);
- Indirect employment: 118 jobs;
- Indirect employment (through supplies and supported by employee spending): 25 jobs;
- Average annual expenditure on goods and services: £32.7m;
- Estimated total project expenditure on goods and services: £457.8m;
- Estimated total project expenditure on goods and services within 5 mile radius of Nant Llesg: £120.9m;
- Average weekly wages at Nant Llesg: £96,000;
- Average annual wages at Nant Llesg : c.£5m;
- Total project wage bill: £70m;
- Estimated total employee spending per annum: £2.38M;
- Total project employee spend: £33.3;

In addition to the above, a Community Benefit Fund of up to £6m would also be provided. Miller Argent would use local recruitment and are seeking to link with local partners such as training agencies and 'Jobcentre Plus' which would combine to enhance the social and economic benefits that the project can bring to the local area. The focus would be mostly on recruiting in the adjacent towns and villages including Rhymney, Pontlottyn and Fochriw where high unemployment and economic inactivity was assessed to be common among local residents. Given the numbers of unemployed among young people (in particular young men) in these areas, the availability of local jobs is expected to be a major enhancement of local prosperity.

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4.1 Overview

The aim of the Restoration Strategy is to restore the land in such a way that provides for informal recreational uses, incorporating open access land, footpaths and bridleways to act as links between the already established Parc Cwm Darran and Bryn Bach Country Park. The Strategy has determined that the provision of public access should be sympathetic to the existing ecological, nature conservation and cultural heritage interests as well as any other interests created as part of the restoration scheme.

Within this overall aim, there are a number of objectives for the strategy:

- To provide a range of landscape characters which reflect the landscape patterns of the area and reintegrate the site into its surroundings whilst upgrading its contribution to the setting of Rhymney;
- To improve the long-term water quality of the River Rhymney;
- To improve accessibility to the public and connection with nearby communities, and increase the amenity value of the site to the community;
- To provide a range of habitats offsetting the habitat loss due to the operations and enhancing other habitats within the site; and
- To reflect the history and archaeology of the area in landscape features, and provide access to the public and information about the cultural heritage of the area.

An aspect of the upgrading of the amenity for the public is the opportunity for interaction with the nature and heritage interests, existing and new, and reconnection with the natural and cultural landscape.

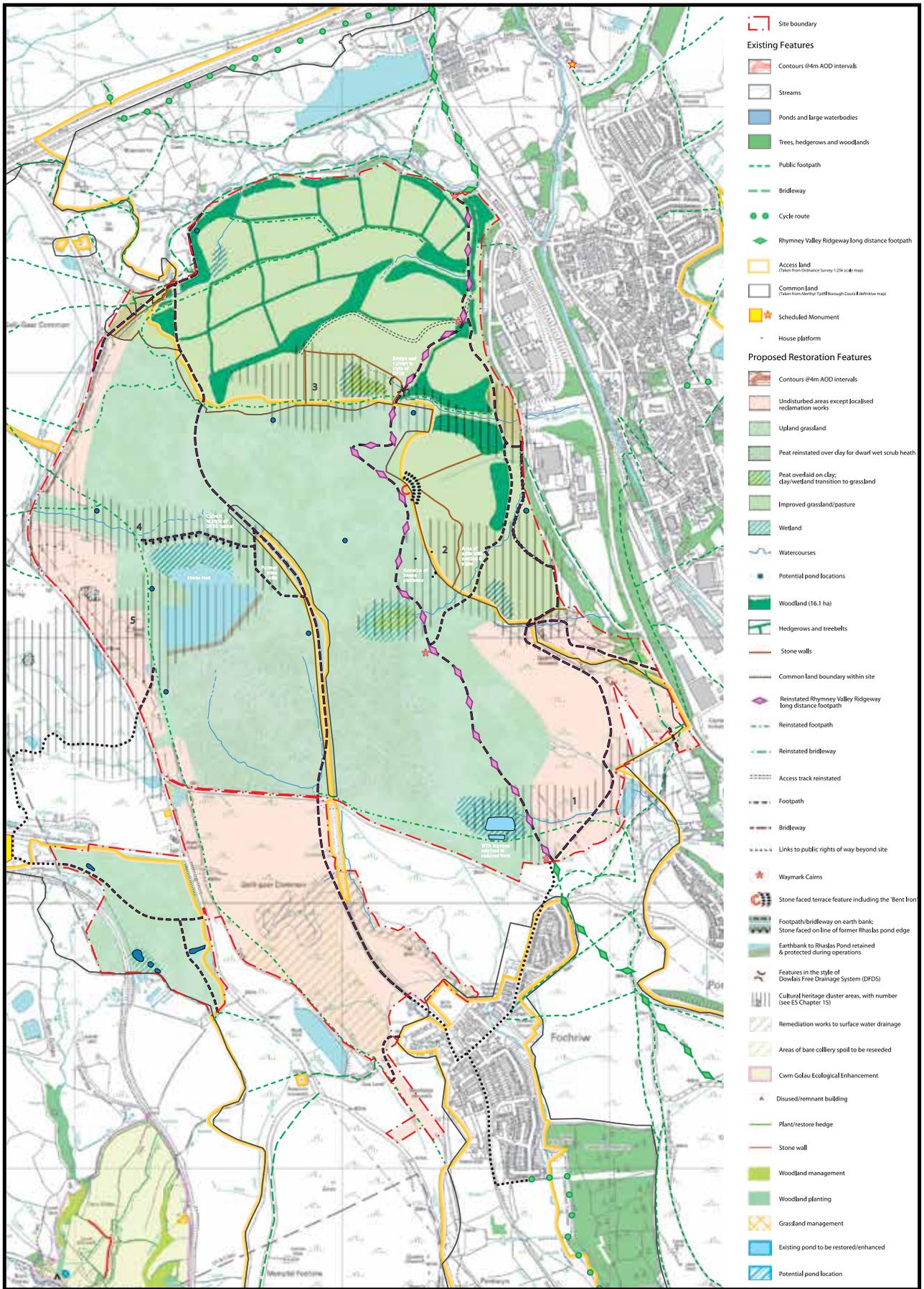
The strategy for the restoration of the site is shown on Figure NTS006.

4.2 Restoration of landscape

The restoration of the site would reflect the various landscape character areas that currently exist across the site. The northern slopes would be restored to enclosed fields of pasture, similar to the layout of the present landscape, with improved hedgerow and woodland planting. On the lower slopes, the restored fields would be smaller and divided by hedgerows. New woodland belts would be established along the field boundaries on the mid-slopes. The upper fields would be larger and would extend up to the edge of the common/access land, reflecting the historic pattern but restoring a formerly characteristic feature of the landscape to a higher standard than currently.

On the eastern valley side, land would be restored to fields of pasture, in a similar pattern to the northern slopes. The Rhymney valley side is sub-divided by stream valleys, along which woodland would be established and extended along part of the lower slopes near the industrial estate. A pattern of small fields divided by hedgerow would be established along the mid-slopes with larger fields divided by stone walls on the upper slopes, again extending to the stone wall marking the edge of the open upland. At the heads of these valleys, small basins of more gentle slopes would be formed, and peat laid over clay to encourage the development of wet heathland. As in the rest of the site, small ponds suitable for an array of wildlife including great crested newt would be established at intervals to extend the habitat for this species around the site.

The open urban common land and access land would be restored with upland grassland over most of the area. In the south, between Rhaslas Pond and South Tunnel Road, peat saved from the initial soil stripping would be laid over recovered clays to provide landform and drainage conditions suitable for development of wet heathland. The western margins of the operational site would remain undisturbed throughout the operations and the restoration landform and vegetation would be merged with the existing. Again, small ponds would be established along the western margin of the area, at intervals suitable for great crested newt habitat, extending the habitat along the western boundary.



NTS006 - Restoration Strategy

Restoration of the land after surface mining

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4.3 Restoration of Rhaslas pond

Partial restoration of Rhaslas Pond as an open water body is proposed. Cadw have indicated that the southern embankment is being considered for designation as a Scheduled Monument and that the retention of the footprint of the pond and the southern part of the open water would be desirable. The southern embankment would therefore be retained and protected for the duration of the scheme and incorporated into the restoration design.

The location of the northern embankment would be defined within the restored landscape by a raised earth bank with a footpath along it, using recovered stone from the original embankment to clad it or as marker stones along its southern face. This would enable visitors to visualise the former extent of the water body, although only the southern part of the water body would be retained; the northern part petering out to a wetland.

4.4 Ecological Features

Habitats which would be restored at the end of operations would include areas of wet heath and marshy grassland to the south of Rhaslas Pond. So far as practicable, the topography, hydrology and soil conditions in these areas would be reinstated to encourage the development of the desired vegetation. Appropriate seed mixes would be sown and the land carefully managed during the aftercare period. Areas of marsh would be reinstated on clay soils at the heads of watercourses which would be created to drain the site to form a similar habitat to that which currently occurs in similar situations within the site.

In the north of the site, new habitats would be created on completion of the scheme as a network of hedgerows and small woodlands. Water treatment areas would be reinstated to form wetland areas and a number of ponds would be created in suitable areas around the margins of the site.



Restoration of the land after surface mining

4.5 Cultural Heritage

The restoration of the site aims to integrate cultural heritage into the landscape that would be recreated. This would include the forging of heritage trails which identify the heritage of the site and the incorporation of known archaeological assets, of prehistoric to mediaeval age into the restored landscape.



4.6 Access and links

Strategic or promoted routes would be re-established, while other routes would be provided as an enhanced network of footpaths and bridleways to replace those closed at the start of the scheme, realigned as required to “fit” with the restoration landscape patterns and features, and provide new routes and links as additional access benefits.



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5.1 Overview

The proposed development has been the subject of a detailed Environmental Impact Assessment (EIA). The final project as proposed in the planning application is the project that has been assessed in the EIA. The design of the scheme has been an iterative process that has informed the design of the proposed development scheme, and the mitigation measures which should be employed.

The results of the EIA process are set out in the ES, its technical appendices and the accompanying drawings. A summary of the key issues and principal conclusions of the respective studies are set out below.

5.2 The Development Team

Miller Argent has engaged a range of environmental specialists to provide advice on the working and restoration scheme, and to identify and address the potential environmental issues which might arise. As part of the EIA process, the team has obtained advice from Caerphilly County Borough Council and other consultees on the issues which should be assessed as part of the EIA and have ensured that they have been comprehensively addressed as part of the reiterative design and environmental assessment of the scheme.

In addition, substantial technical inputs have been provided by in-house expertise available at Miller Argent, most notably relating to the design of the working scheme, geology, geotechnical issues, coal resource assessment, civil engineering, and the markets for coal.

Social impact assessment

6.1 Overview

Within the social assessment considerations were given to the economic impacts generated by the Nant Llesg scheme on the local area, and to a degree on the wider area of Caerphilly and Merthyr Tydfil county borough areas where most of the economic impacts on residents and businesses are likely to occur. This includes the changes in local labour and any impact that this might have on housing and other community infrastructure.

6.2 Existing Conditions

The population in the Nant Llesg local area has largely been static for some time and is projected to remain relatively unchanged for the period to 2030. Most (64%) of the local area resident population are of working age, which is positive for sustaining the area, but within this group, there is relatively high unemployment and long term unemployment, particularly among young men. There are also low levels of economic activity among the working age resident population, again with young men most prone to this. The consequence of low economic activity coupled with high unemployment is a problem for local prosperity.

This is evidenced further in the Index of Multiple Deprivation statistics, which shows widespread deprivation, with all neighbourhoods in the local area being within the most deprived 30% of neighbourhoods within Wales, and nearly half the neighbourhoods in the most severely deprived 10% of neighbourhoods in Wales. Local employment deprivation is a major problem, and education disadvantages have also been identified to be a moderate problem.



6.3 Predicted Effects

It is estimated that the proposed Nant Llesg surface mine would directly employ an average of between 144 and 239 workers on-site for 14 years of operation (this would fluctuate from year to year). The range reflects whether a one shift or split shift (i.e. a two shift) working pattern is adopted at the Nant Llesg site. When other jobs that are created as a result of the whole project are taken into consideration, i.e. land aftercare, supplier spending and employee spending in the local economy, it is estimated that the project would support between 287 and 382 jobs, of which some 173 to 249 jobs are within 10 miles of the site.

Miller Argent would use local recruitment and are seeking to link with local partners such as training agencies and 'Jobcentre Plus' which would combine to enhance the social and economic benefits that the project can bring to the local area. The focus would be mostly on recruiting in the adjacent towns and villages including Rhymney, where high unemployment or economic inactivity was assessed to be common among local residents. Given the extent of deprivation and the numbers of unemployed among young men in these areas in particular, the availability of local jobs is expected to be a major enhancement of local prosperity.

With a large identified pool of under used labour in the local area, the impact of the job increases is expected to pose little additional burden on the provision of new public funded services and housing because most of these jobs are expected to be filled from residents already living locally.

There are approximately 200 businesses within the Nant Llesg study area (i.e. up to 10 miles from the Nant Llesg site), and they employ some 2,000 workers. The impact of the scheme is likely to add to local economic activity, and although there may be perception by some businesses that the scheme would have a negative visual impact on their location, the neighbouring Ffos-y-fran Land Reclamation Scheme has been running similar activities to the Nant Llesg scheme for some years without any noted negative effects on local businesses. Indeed, all identified effects have been beneficial.

Overall, the economic impacts associated with job creation are assessed as having a major significant beneficial effect. Likewise the re-training and local economic activity impacts are assessed as bringing moderate significant benefits.

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7.1 Overview

Likely environmental effects on recreational and tourist resources arising from the site establishment operations, the operational surface mining, remediation and restoration phases of the project were assessed. This included effects on recreational and tourist resources and land used for recreational activities, including walking, cycling and horse riding along the existing network of public rights of way (PRoW), common land and other land benefitting from a right of public access.

7.2 Existing conditions

The proposed project is partly located on the Gelligaer and Merthyr Urban Common which predominantly comprises open-mountain grazing land, with some areas of old mineral working deposits and mining dereliction. The public have a right of access over the urban common for air and exercise on foot and on horseback. This area of urban common is also designated as 'Access Land' which reflects the public's right to use the land for the purpose of open-air recreation on foot. In addition, public access is available along a number of public rights of way which cross the site. User surveys of these PRoW showed that they appear to be little used. Rhaslas Pond, within the site is a popular location for walkers. There are no other recreational facilities within the site. Beyond the site recreational and tourist facilities include those within the Brecon Beacons National Park to the north, Parc Cwm Darran to the south, Parc Bryn Bach to the east and at Bute Town Reservoir.



7.3 Predicted Effects

Outside the operational area of the proposed surface mine, land remediation works are proposed to the east, west and south which will include the making safe of a large number of shafts and adits associated with old mine workings, which are located within the common land and access land. Additional areas of land would be made available, outside the site for temporary public access for the duration of the Project and an area for ecological compensation is proposed at Bryn Caerau Farm, to the south-west of the site, to which there would be permissive public access.



During the preliminary site establishment and mining operation phases there would be a temporary suspension of rights to access approximately 201 hectares of common land and the public rights of way across the site would be stopped up. During remediation works areas to the east of the site would however remain open to public access, with some minor deviations to existing routes while remediation works are carried out. To the west of the site, access would be made available once power line diversions are completed.

Additional areas would be made available for public access from the outset of the project and some additional linear routes would be made available to walkers, and in some cases, horse riders and cyclists. In some instances these additional areas would only be available following the completion of the early land remediation works, for example the new route along the eastern side of the site, adjacent to the Heads of the Valleys Industrial Estate, which are scheduled for completion within two years of commencement of coaling. The existing bridleway that runs to the north of the site would also be permanently extended to allow east-west access between the A469 and the Fochriw Road. Rhaslas Pond would fall within the operational area and would not be available for public access, until such time as the restoration of the site is complete.

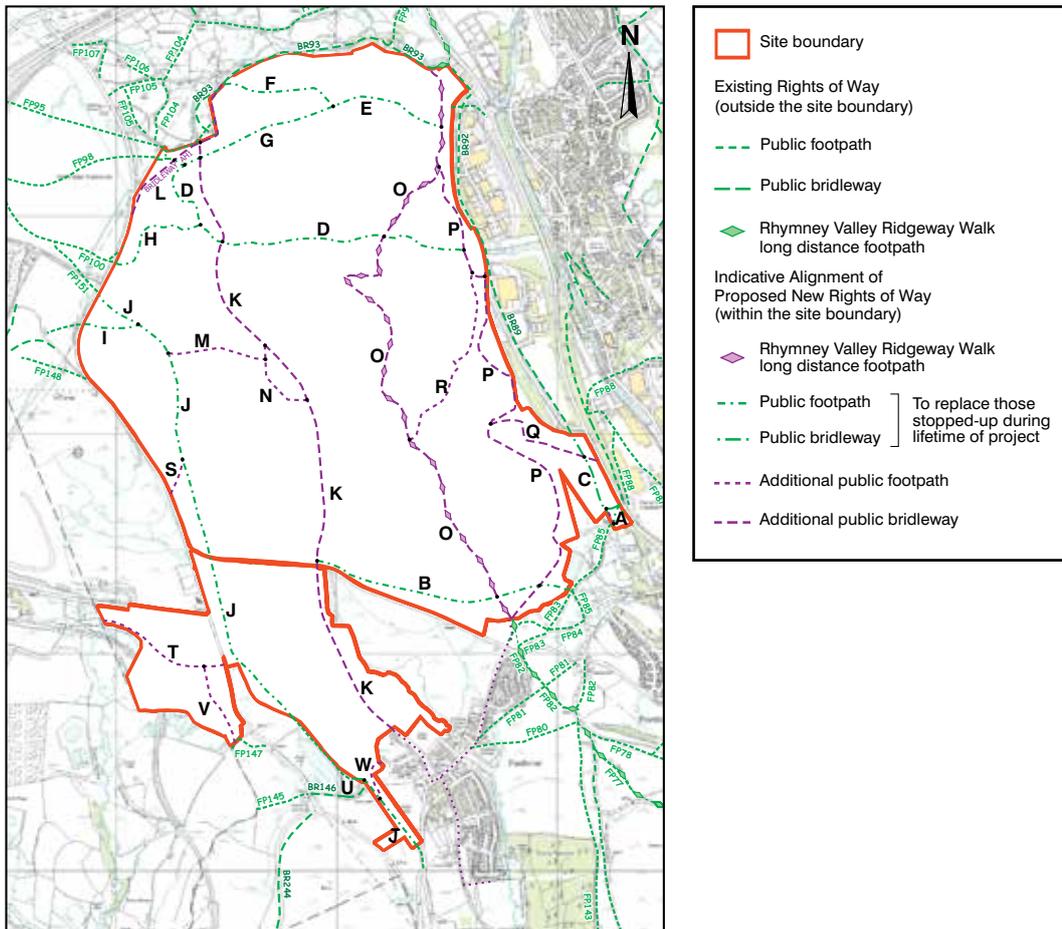
Recreation & tourism

There would therefore be long term temporary minor adverse effects on common land and public rights of way during the coaling operations, although the effects on public rights of way would be reduced by the retention of north south links while land remediation is carried out and the by the provision of additional recreational routes following completion of land remediation works.

The site would be restored in accordance with the Restoration Strategy, which includes the re-instatement of the rights of common and public access, public rights of way and additional linear routes. This includes small additions to the area of common and new routes along the eastern side of the site adjacent to the Heads of the Valleys Industrial Estate, some of which would be available within two years of the commencement of coaling, together with the creation of a new bridleway across the site following

the alignment of the old dismantled railway and the establishment of the Rhymney Valley Ridgeway Walk along a new bridleway. Links between the common and adjoining recreational resources such as Parc Cwm Darran and the national cycle network would also be improved by the provision of these new routes. Rhaslas Pond would be re-established and a new footpath would be created running along the northern side linking to other linear routes across the common. The Bent Iron feature would be reinstated on the edge of the urban common within a stone faced terrace. The restoration would therefore result in permanent minor benefits to the Gelligaer and Merthyr urban common and permanent minor to moderate benefits to the local public rights of way network.

The proposed layout of reinstated footpaths and bridleways is shown on Figure NTS007.



NTS007 - Reinstated Footpaths and Bridleways

Nant Llesg Surface Mine

Incorporating Land Remediation

8.1 Overview

The traffic and transport assessment considered the effects associated with the site enabling works, operation and restoration/aftercare phases of the proposed Nant Llesg project.

The study area for traffic and transport has been defined as the public road network in the vicinity of the Nant Llesg site which would be used during its construction and operation. This includes the A465 and A4060 trunk roads and the unclassified Fochriw Road, Bogey Road and Rhymney Common Road which provide access to the development site from the trunk road network.

8.2 Existing conditions

Annual Average Daily Traffic (AADT) flows were obtained for sites on the local highway network using Automated Traffic Count (ATC) data collected during the year 2010, supplemented by a traffic count data undertaken at the Fochriw Road/South Tunnel Road junction in November 2011.

The data show that existing traffic flows on the local highway network are highest on the A465 Heads of the Valleys Road, although traffic flows are significantly lower than design capacities on all roads. This means that local roads could continue to operate satisfactorily even with substantial increases in traffic volumes.

Analysis of accident data indicates very few clusters of injury accidents on the local highway network and none can be considered statistically significant. It is clear that HGVs have not been instrumental in the cause of the accidents recorded, although it is also clear that a significant number of HGVs use the local highway network.



Traffic & transport

8.3 Predicted impacts

If the project was implemented, there would be an increase in traffic movements on the local highway network during the site enabling works and site operation phases in particular. The increases would be greatest on the route between the Nant Llesg site and Cwmbargoed Disposal Point, a distance of approximately 800m, as well as the main route to the trunk road network, i.e. via Fochriw Road and Rhymney Common Road. An increase in traffic flows of 48% on Bogey Road (from the CDP entrance to its junction with Fochriw Road – movements west of the CDP entrance would be restricted to LGVs and so would be of a lesser magnitude) and 27% on Fochriw Road (north of its junction with South Tunnel Road) is forecast as a result of the project. However, the impact of the project upon the operation of the rail network would be negligible, as it would remain well within capacity.



Proposed measures to mitigate the highway impacts include:

- A Site Environmental Management Plan (SEMP), to manage the impacts of HGV movements on the local highway network; and
- Improvements to the Bogey Road/Fochriw Road junction, to improve visibility for turning vehicles.

8.4 Conclusion

It is considered that the traffic and transport impacts of the project would be of temporary long term minor adverse significance with respect to highway operation, highway safety and non-motorised users (i.e. pedestrians/cyclists). The impact on physical fitness is judged to be not significant as there are very few people living adjacent to the site or the main HGV routes to it, and so very few people would be discouraged from walking or cycling as a result of the project. However, during the site restoration/aftercare phase, the potential creation of new pedestrian and cycle routes could deliver minor permanent benefits in respect of non-motorised users and physical fitness.

Nant Llesg Surface Mine

Incorporating Land Remediation

9.1 Overview

Sites of importance for nature conservation, habitats, species populations, and species assemblages present within and in the vicinity of the site have been identified through desk study and surveys. The effects of the Nant Llesg proposals on ecology and nature conservation have been assessed taking into account measures to avoid or reduce the effects which are integral to the design of the project and which would be secured as part of the proposal.

The Restoration Strategy forms the basis for the assessment of the effects of the restoration of the site. This is a comparison of the ecological characteristics of the restored landform and vegetation against the baseline situation before the commencement of the scheme.

9.2 Existing conditions

There are no statutory sites located within the site boundary although there are 28 sites with a total of 36 statutory designations within 10km of the site. These comprise two Special Areas of Conservation (SACs), 18 Sites of Special Scientific Interest (SSSI), 11 Local Nature Reserves (LNR) and four Country Parks. Some sites have more than one designation. There are no Special Protection Areas (SPAs) or Ramsar Sites within the search area.

There is a total of 20 non-statutory designated sites within 2km of the site, all designated as Sites of Importance for Nature Conservation (SINCs). Much of Cefn Gelligaer, west of Deri SINC is within the site boundary, and there are three further SINCs located within 50m of the site boundary.

9.3 Site Restoration and aftercare

The restoration and aftercare proposals for the site take account of the habitats and species currently present within the site, and seek to re-establish topographical, soil and drainage conditions and management practices which would support these habitats and species. In particular habitats and species included in the Caerphilly Biodiversity Action Plan (BAP) have been taken into account. Local BAPs are intended to focus resources to conserve and enhance biodiversity by taking account of national and local priorities. Thus the restoration and after care proposals include specific measures to reinstate wet dwarf shrub heath in the area south of Rhaslas Pond. New ponds would be created by modifying the water treatment areas used for the development and watercourses would be established as part of the drainage of the restored site. A network of hedgerows would be established within the farmland area in the north of site, with new woodland areas here and in the east of the site. The restored site would provide habitat for Caerphilly BAP species such as great crested newt and other amphibians, common lizard, bats, otter, lapwing and a range of other breeding and wintering birds.



9.4 Biodiversity offsetting

The nature of the proposed development means that it is not possible to fully mitigate the ecological effects of the proposals within the Nant Llesg Site. In order to offset these effects it is proposed to implement ecological enhancements and management in an area to the south west of Nant Llesg known as Bryn Caerau.

The land at Bryn Caerau already contains a variety of habitats of value and supports protected and notable flora and fauna. However, there are a number of opportunities available to enhance the overall ecological value of the area by creating new habitats and by managing both the existing habitats and new habitats created. The land is part of the holding known as Bryn Caerau Farm which is owned by Miller Argent (South Wales) Limited and farmed by tenants. Management of the land at Bryn Caerau would be secured by means of a S106 agreement.

The land at the north of the Nant Llesg site which would be restored to enclosed agricultural grazing land would, at the end of the aftercare period, return to the current landowner who would continue to farm the land.

Management of the land at the south of the Nant Llesg site, following the aftercare period, would be the responsibility of the commoners as is currently the case.



9.5 Predicted impacts

As a result of the land take of the project there would be an temporary long term impact of major significance on breeding birds (in particular the loss of the nesting area for two pairs of little ringed plover, suitable habitat for which would be reinstated on restoration). There would be temporary long term impacts of moderate significance on non-statutory designated sites (loss of much of the Cefn Gelligaer SINC, although this would be restored on completion of the scheme), habitat loss (particularly wet heath, unimproved acid grassland and marshy grassland), wintering/passage birds (especially those associated with Rhaslas Pond), terrestrial invertebrates (including grayling and small heath butterflies and broom moth), and dragonflies and damselflies (including the scarce blue-tailed damselfly). Suitable habitat for species which currently occur on the site would be reinstated on restoration. Other than for these instances, the remainder of the ecological effects would be of negligible or minor significance.

During operation of the site no additional adverse effects would be of greater than minor significance. There would potentially be beneficial effects on amphibians and bats as a result of habitat creation (and for amphibians, through provision of road crossings), and to otter and fish as a result of improvements to downstream water quality.

Comparing the restored site with the baseline, the majority of effects would be of negligible or minor significance. There would be potential moderate adverse effects on non-statutory sites and habitats, breeding and wintering/passage birds (taking account of the long timescales required for full recovery of the restored areas). There are likely to be beneficial effects on amphibians, reptiles, bats and otter as a result of habitat creation (and for amphibians, provision of road crossings), and on fish as a result of improvements to downstream water quality.

Taking into account the likelihood of the wet heath recovering, the existing and continued threats from overgrazing, and the habitat improvement and management of Bryn Caerau, then the overall balance of biodiversity of the area would be maintained.

Nant Llesg Surface Mine

Incorporating Land Remediation

10.1 Overview

Likely environmental effects on agricultural land use and soil resources arising from the site establishment operations, operational surface mining, remediation and reclamation phases of the project were assessed. This included effects on agricultural land quality, soils resources, farm holdings and the agricultural land use of the Gelligaer and Merthyr Common.



10.2 Existing conditions

The detailed soil and agricultural land classification survey of the land likely to be disturbed by the implementation of the Nant Llesg project has found approximately 41% of the operational area to have been previously disturbed by firstly iron ore scouring and subsequently by surface mining and tipping operations. The remaining land which would be stripped of soils as part of the operation comprises natural soil profiles. Approximately 64.9ha of this land contains soils with peaty topsoils.

The Agricultural Land Classification provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use, where Grade 1 is excellent quality and Grade 5 very poor quality. The land across the site is limited to Grade 4 due to a severe climatic limitation, or grade 5 due to a severe soil wetness limitation. Welsh Government planning policy stipulates that land of grades 1 to 3a is the best and most versatile, and should be conserved as a finite resource for the future. None of the land at Nant Llesg falls within those grades.

The operational area of the project would affect two farm holdings outside the boundary of the Gelligaer and Merthyr Common. One holding comprises land on the eastern side of the Nant Llesg project and the second is based at Cwm Carno, located to the north of the project.

A total of approximately 201 hectares of the land affected by operational area of the project forms part of the Gelligaer and Merthyr Urban Common which represents approximately 6.5% of the total area of the Gelligaer and Merthyr urban common.

Agricultural land use & soils

10.3 Predicted effects

There would be no loss of the “best and most versatile” grades 1, 2 or 3a agricultural land arising from the project.

Strategies for the stripping, storage and reinstatement of mineral and peaty soils have been developed to reduce, wherever possible, effects on soil resources. Based on limited losses of materials during the process of soil stripping and storage and handling the effect on non-peaty soil resources at the end of the project is therefore assessed to be a permanent adverse impact of only minor significance.

With regard to the clayey soils with a peaty surface, it is recognised that these peaty soils are sensitive materials and are susceptible to damage and losses when disturbed.

It is therefore assessed that a loss of a proportion of these sensitive materials may result from the operations taking place and the overall effect on these clayey soils with a peaty surface is of permanent moderate adverse significance.

The project would only affect the workability of the farm holding based at Cwm Carno, where the holding could not continue in its current form during the lifetime of the project. The significance of this effect on a single holding in the context of the wider framework of farm holdings and agricultural production in the local area is assessed to be of long term temporary minor adverse significance during the operational period and of negligible significance following the reinstatement of the agricultural land affected within the holding.

The project proposals include the provision of approximately 81ha of temporary grazing land that runs contiguous to the common that would be available for use by those commoners with grazing rights throughout the life of the project. This would provide areas of good quality improved grassland to the commoners. The inherent quality of the agricultural land within the additional areas is generally of better quality than the areas of grazing lost on the Nant Llesg site, where there are limited natural soil resources due to the extent of previous mining disturbance and areas of low capacity grazing land where clayey soils with peaty topsoils are located. It is predicted that the loss of grazing capacity within the common as a whole will result in an effect that is long term temporary minor adverse significance.

There are however a number of individual commoners in the vicinity of the Nant Llesg project who use this area of land on a regular basis for grazing livestock and who would be more specifically affected by the temporary loss of the common within the project and the effect of site establishment and operational stages of the Nant Llesg project on the local structure of farm holdings which use the Nant Llesg area on a regular basis would be of long term temporary minor to moderate adverse significance.

The restoration of the land in accordance with the restoration strategy and the effective implementation of the aftercare period would enable the land to be effectively re-integrated into the common. Based on the successful restoration, the residual effect on the agricultural use of the common is assessed to be of negligible permanent significance.

Nant Llesg Surface Mine

Incorporating Land Remediation

11.1 Overview

The hydrogeology assessment looks at potential effects on the local hydrogeology from the proposed Nant Llesg project. It also deals with the potential need to treat any pumped groundwater prior to discharge to surface watercourses, and the potential longer-term effects of the restored site in terms of groundwater quality.



11.2 Existing conditions

The bedrock in the area of the Nant Llesg site comprises Lower and Middle Coal Measures strata which are made up of alternating mudstones, siltstones and sandstones with intermittent coal seams and ironstone units. Drilling investigations of the Nant Llesg site have indicated a relatively consistent stratigraphy, with the strata dipping steadily south-south-eastwards at angles between 3° and 9°, with minor faulting trending north-northwest to south-southeast. Overlying, superficial deposits comprise variable thicknesses of a range of materials, namely gravels, clays, sand and made ground, as well as areas of opencast backfill in areas worked for coal in the past.

The Coal Measures strata in the area are classified as a secondary A aquifer (formerly classified as minor aquifer). Such aquifers are often capable of supporting water supplies at a local scale, but there are no licensed groundwater abstractions or private water supplies in the near vicinity of the proposed development. Overall groundwater use in the area is minimal; although it does provide a contribution to flow in the River Rhydney.

An underground artificial drainage network heavily influences the local groundwater flow regime. This drainage system, which was developed in the 18th and early 19th centuries, comprised a complex system of water collection ditches, canalised streams and a series of stone-lined culverts. This is called the Dowlais Free Drainage System (DFDS) and was developed partly to provide a water supply to the ironworks at Dowlais and Rhydney and partly to drain underground mine workings. It is still functional at depth and dominates groundwater movement in the area.

Hydrogeology

Groundwater level monitoring data indicate that groundwater levels can be over 100m below ground level, and are often associated with the elevation of the DFDS. The inferred eastward direction of groundwater flow beneath the planning application site is also largely controlled by the DFDS and its discharge into the Bute Watercourse, which itself discharges into the River Rhymney within a culvert which runs through the town. The Environment Agency (now Natural Resources Wales) has assessed the mine water outfall from the culvert, referred to as the 'Pontllytyn' mine water discharge, as the second worst impacting coal mine water discharge in Wales, that has not yet been remediated. The Coal Authority, having carried out their own investigations into the problem, considers that, at the present time, remediation is probably infeasible, mainly due to health and safety concerns of entering the river culvert to capture and transfer the water.

The quality of groundwater in the area is quite poor, with elevated concentrations of several metals, including iron, manganese and zinc. Similarly, water quality associated with the DFDS is poor and causes some deterioration in the river water quality.

11.3 Monitoring

An extensive surface water and groundwater monitoring scheme would be agreed with Natural Resources Wales (NRW, formerly Environment Agency Wales (EAW)) which is anticipated would incorporate existing borehole and stream monitoring locations. This would serve to monitor the effects of the development and site restoration on local groundwater levels and surface water and groundwater quality. Appropriate consents and licences would need to be obtained from NRW for water management at the site.

11.4 Predicted Effects

Dewatering of the void is likely to be required to maintain dry working conditions, although this may only be required once excavations have reached considerable depth. This would involve pumping a combination of surface water and groundwater to water treatment areas at the surface, before discharge to the River Rhymney. The effects of dewatering on local groundwater levels have been considered and are expected to be limited and of minor significance, and reversed on restoration. During operation the proposed water treatment would provide a temporary benefit of moderate significance with respect to river water quality. The removal of coal strata and the implementation of an approved backfill strategy as part of site restoration would provide a longer-term permanent water quality benefit of moderate significance. It is important to note that the Coal Authority currently consider that in the absence of the project, remediation of the DFDS discharge is "probably infeasible mainly due to health and safety concerns of entering the river culvert to capture and transfer the water"

Nant Llesg Surface Mine

Incorporating Land Remediation

12.1 Overview

Surface water is assessed in terms of the water quality, water quantity, flood risk, and hydromorphology of the water bodies present in and around the Site (i.e. watercourses, ponds, wetlands and reservoirs). The hydrology and drainage assessment looked at the potential effects of the proposed development on hydrology, i.e. surface water features in and around the proposed project site.



12.2 Existing conditions

Various watercourses rise on the Nant Llesg site (the 'Site') and drain towards the River Rhymney, but these comprise a small proportion of the upper River Rhymney's overall catchment area. A series of manmade drainage ditches and ponds are present on and adjacent to the Site, comprising the surface elements of the Dowlais Free Drainage System (DFDS). The largest component of these surface water features is Rhaslas Pond, which is an artificial water body with water levels raised above local ground levels by manmade embankments.

The only nearby user of water adjacent to the Site is the existing Ffos-y-fran Land Reclamation Scheme (FLRS). Information provided by the Environment Agency Wales (EAW) - now Natural Resources Wales (NRW) - and local authorities (Caerphilly and Merthyr Tydfil County Borough Councils) indicate that there are very few abstractions from the ground or watercourses and discharges to watercourses in the vicinity of the proposed development. Overall surface water utilisation in the area is minimal.

Monitoring data indicate that, whilst a variety of broader water quality indicators are generally good around the Site, the water quality is impacted by the area's historic mining/industrial legacy, with elevated levels of iron and other metals being recorded. A key influence on water quality is the discharge of untreated minewater, which is particularly high in iron and manganese, into the River Rhymney from the Bute Level (a minewater drainage system). This discharge occurs towards the southern end of the Rhymney culvert at Pontlottyn and is responsible for the current severe orange ochre staining of the river bed in this area. The discharge is currently considered the second worst unmitigated discharge in Wales by Natural Resources Wales.

In addition to chemical pollution, severe erosion problems are present along the Nant Bargod Rhymni above Fochriw. It is considered that the erosion of colliery spoil (alongside other sediment sources along the watercourse) is the source of the fine material transported downstream to Parc Cwm Darran Country Park, where this material is being deposited at the head of the lake and which has to be cleared from time to time. The soft unconsolidated material deposited underwater is considered a health and safety issue and warning signs have been erected alongside the lake inlet.

Hydrology & drainage

12.3 Mitigation

The key mitigation measure identified was the need to manage water draining from the Site to ensure that water quality was not adversely impacted and additional runoff is captured, stored and released slowly at a rate matching the existing overall runoff rate. A Surface Water Management Plan (SWMP) has been prepared to demonstrate this. The SWMP provides detail of how drainage from the Site would be managed, and explains how a series of water treatment areas (WTAs) would be incorporated to provide water quality treatment and attenuate runoff.

A series of Method Statements would be followed to ensure works that could have adverse effects on the water environment follow current best environmental practice. These describe a means of undertaking the required site operations in a way that minimises or avoids actions that could have negative water environment effects.

12.4 Flood risk

Downstream water quality would be protected as a result of the SWMP, and there would be no increase in flood risk due to the installation of attenuation lagoons as part of the WTAs. In fact, flood risk would be slightly reduced for regular storm events (between the 1 in 1 year and 1 in 100 year + climate change), since the outflow from these attenuation facilities would actually be less than the baseline greenfield rates. This low rate is required for operational reasons to ensure appropriate settlement and treatment of the runoff to meet agreed water quality standards. In addition, during the Operational period of the site, the routing of overflow from Rhaslas Pond during the largest flood events into the mine void would result in a reduction in flood risk posed to receptors along the Nant Carno compared to the current baseline.

12.5 Predicted Effects

Following the incorporation of operational mitigation measures, the residual effects relate to the reduction in size of Rhaslas Pond and its incorporation into the Site's surface water management system during the operational phase. During this phase the upper reaches of several watercourses would be removed, although all of these watercourses would be reinstated during the restoration phase.

The scheme has two key and important positive effects on the surface water environment, which are:

- Minor Positive significance - Some of the underground manmade minewater drainage network would be interrupted by the void during the operational phase of the scheme; this would result in reduced minewater discharges entering the Bute Level. Subsurface drainage pathways would be reinstated during backfill to prevent unintended new flow-paths being created. However, since a large proportion of the remaining coal would have been removed (including the sulphur within it), it is considered that the acidity of groundwater would be reduced. Overall it is expected that the works would contribute to an improvement in downstream water quality in the River Rhymney, an important surface water receptor;
- Moderate Positive significance - Works to stabilise, retain and revegetate the eroding colliery spoil along the Nant Bargod Rhymni would result in reduced siltation of the lake at Parc Cwm Darran. These works would be carried out in the early stages of the scheme providing a rapid improvement in this area.

An extensive surface water and groundwater monitoring scheme will be agreed with NRW, which is anticipated to incorporate existing stream monitoring locations. Appropriate consents for the discharge of treated water will be obtained together with abstraction licences for dewatering of the excavation and dust suppression operations.

Overall the predicted adverse effects are considered to be of minor significance.

Nant Llesg Surface Mine

Incorporating Land Remediation

13.1 Overview

The air quality impacts of the project were assessed. It included the operation of the Cwmbargoed Disposal Point (CDP), the proposed remediation works and the export of coal from the site. The impact on nitrogen dioxide (NO₂), airborne particulate matter and dust deposition was modelled using well recognised models.

13.2 Existing air quality

Air quality in the area surrounding Nant Llesg is currently good with the national air quality objectives being achieved by a wide margin. The baseline dust data, collected over six years, identify that there have only been very occasional dust events in Fochriw, i.e. times when people may complain about dust. In Rhymney, where monitoring has been undertaken for more than one year, there have been occasional dust events at the Heads of the Valley Industry Estate, but not at the two Primary Schools, suggesting a local source, most likely from within Rhymney, affecting the industrial estate.



13.3 Mitigation

The assessment of the impacts of the project has assumed that there would be best practice dust mitigation at all stages of the development. Key to this is proactive management of the site including forecasting when dust generating conditions may occur and putting appropriate mitigation in place before complaints are received. The main method of suppressing dust emissions is through the application of water using water bowsers on the unpaved haul routes, Fog Cannons® which spray a fine mist over a large area and are very effective at grounding dust, and mist sprays on coal handling equipment and at coal stocking areas. An integral part of the management of dust emissions is monitoring in the local community, and a monitoring programme would be agreed with Caerphilly County Borough Council and appropriate actions taken, including investigation and ceasing dust making activities implemented when appropriate. A proactive approach to dust management is envisaged by Miller Argent.

Air quality & dust

13.4 Predicted impacts

It is predicted that the air quality objectives would be achieved during all phases of the project. Using the Institute of Air Quality Management criteria, the magnitude of the change in concentrations at residential receptors as a result of the proposed mine is generally small to medium, but due to the good baseline air quality in the area, the significance of the impact at most residential receptors is negligible. However, for a small number of receptors, notably in Rhymney and Fochriw, a minor adverse air quality impact is predicted during site operations.

The most significant impact predicted is dust deposition. During stages 1 – 4 of the project there is predicted to be a minor adverse impact at most receptors. At one receptor a moderate adverse impact is predicted during stages 3 due to the cumulative impact of the mine operations and the removal of the FLRS overburden mounds. In contrast, residential receptors in Fochriw are predicted to see a small improvement in dust deposition during phases 4 and 5 as a result of the end of cooling at Ffos-y-fran Land Reclamation Scheme, and an associated reduction in operations at the CDP.

13.5 Conclusion

Taking account of the duration of the operation of the surface mine (approximately 14 years) the overall impact following mitigation is predicted to be of minor adverse significance using the Institute of Air Quality Management's significance criteria. This is considered to be a long term, albeit temporary, impact.

The decommissioning of the CDP may result in dust emissions. The modelling suggests that after decommissioning there will be a reduction in dust deposition, and that this will be a minor benefit to the local community. However, the directional dust measurements and complaints records suggest that dust deposition will very rarely be an issue in Fochriw.



Nant Llesg Surface Mine

Incorporating Land Remediation

14.1 Overview

Surface mining and land remediation necessarily involves the use of large diesel-powered plant operating in the open and is therefore a noise generating operation. The main noise producing activities associated with the proposed surface mine are: soil stripping, removal of overburden and creation of the overburden mound, coaling and haulage within the site, backfilling the void, returning overburden to the void, and site restoration. Noise may also be experienced in surrounding areas by the export of coal from the site and by road traffic generated by the working of the site.

14.2 Mitigation

The mobile plant required to operate the proposed surface mine and land remediation scheme has the potential to cause noise in the surrounding communities. The plant to be used on the site would be manufactured and bought to the strictest noise specifications and would incorporate additional noise attenuation equipment this would allow the mine to be operated within the limits recommended by the Welsh Government in MTAN2.

A visual and acoustic screening bund is to be placed between the working void and properties in Rhymney to the north and east. The construction of the screening bund will be planned in a manner that will minimise the short term effects during construction of the mound by constructing the outer edge of the mound first and then back-filling to complete the screen mound behind the outer face. The screening bund will be constructed during the first 4 months of excavation works.



14.3 Predicted effects

Noise would be audible in the surrounding communities of Rhymney and Fochriw and the significance of this noise depends upon the change in noise compared with the existing background noise. Surveys have been carried out to establish the existing noise conditions and the noise from the proposed development has been predicted for all surrounding areas. Comparison of these two sets of data has allowed the significance of the increases in noise to be assessed and any noise increases do not exceed the MTAN2 guidelines of background noise plus 10dB. The increases in noise are generally negligible or minor, but are assessed to be moderate in quieter and more exposed locations.

Prior to the commencement of the surface mine working there will be land remediation work carried out on an area of land immediately north of Fochriw and south of the land required for the mine. The noise from this work has been calculated and assessed against the guidance in the relevant British Standard, BS 5228, and shown to meet this guidance.

The dispatch of coal by rail could potentially cause up to a 70% increase in the number of coal trains using the route from the Cwmbargoed Disposal Point (CDP). These trains would be permitted to use only the train paths already available for coal trains. The worst-case noise impact for a daytime or night-time period would be no worse than currently experienced as there are days and nights when the maximum permitted numbers of train movements are already used. The impacts of increased train movements are therefore considered to be either negligible or of low significance.

Coal would be moved by road from the surface mine to the CDP. This route is approximately 700 metres long, but is remote from any housing and consequently would not increase noise at any residential property.

Blasting & vibration

15.1 Overview

A blasting impact assessment was undertaken for the proposed Nant Llesg site to determine any potential impact of vibration and air overpressure produced from blasting operations at the site on buildings and structures close to the proposed site. This assessment was carried out by determining the potential receptors in the immediate vicinity of the proposed site and assessing the underlying and surrounding geology and historic workings.

Sixteen representative receptors were identified. The types of buildings and structures included five residential properties, two un-occupied properties, six industrial buildings and three structures. Cwm Nant, a residential property to the north-east of the proposed site, was determined as the nearest sensitive property to proposed blasting operations at a distance of 433m from the limit of blasting. Although blasting operations would be carried out closer than 500m to the nearest structure, no blasting would be carried out within 500m of the settlement boundary.

15.2 Existing conditions

No historic vibration or air over pressure results were available from the Nant Llesg site and so test blast and historic blasting data collected from the nearby FLRS was used instead. The use of this data was based on the logical expectation that the vibration and air overpressure levels produced would be similar, given that both sites have common geology and that blasting practices employed on the Nant Llesg site would be the same as those currently employed on the FLRS. A series of vibration and air overpressure predictions were calculated for each receptor using specifically designed blast monitoring exercises at the FLRS, and corroborated by the comprehensive blast monitoring data available at that site.

15.3 Predicted impacts

The magnitude of the vibration predictions generated for the nearest residential and industrial buildings to the site were very low. Predicted vibration levels, to a 50% confidence level, were near to the human perception threshold of 0.50 millimetres per second but well below the MTAN2 maximum vibration limit guide of 6 millimetres per second. Based on a 95% confidence, the highest calculated vibration prediction is 5.47 millimetres per second at the closest building which is an unoccupied property, below the MTAN2 maximum vibration limit guide.

Air overpressure levels are also predicted to be very low, with the nearest sensitive property, Cwm Nant predicted to receive levels of 7.38 Pascals (111 decibels linear) to a 50% confidence. All predicted levels for the various properties identified were below the MTAN2 maximum level guidance of 120 decibels linear (18.90 Pascals), with 95% confidence.

15.4 Conclusion

Given that the current blast design, execution and monitoring regime employed at Ffos-y-Fran would be adopted at Nant Llesg and based on the vibration and air overpressure predictions generated for the Nant Llesg site, the potential impact from blast induced vibration and air overpressure on all of the identified potential receptors is considered to be long term temporary of negligible to low significance. An extensive blast monitoring and management schedule will be developed as part of on-going assessment of the effects of blasting on the local community.

Nant Llesg Surface Mine

Incorporating Land Remediation

16.1 Overview

The archaeological assessment was based on exhaustive desk study research, field walking and some site evaluation, undertaken to the standards of the Institute for Archaeologists. The objectives of the cultural heritage assessment were to assess the proposed development site in terms of its archaeological and historic environment potential, to assess the potential impacts of the development upon the cultural heritage resource; and to propose measures to mitigate any predicted significant adverse effects.



16.2 Existing conditions

The Nant Llesg site is a landscape of hills with a distinctive historic character which, along with the area around the site evidences human activities from prehistoric to recent times. Today, the surrounding landscape mostly bears testament to mediaeval and post-mediaeval rural farming, including some farmhouse sites, associated fields, and open animal husbandry on Gelligaer and Merthyr Common. Superimposed on this are visible and buried features of 18th to 20th century industry. The substantial numbers of archaeological features (assets) spread throughout the site and setting are remains of the once vast South Wales mining industry, of ironstone then coal.

As a result of the site's industrial heritage there are remains of coal mines, including locations of pit heads with shafts, adits, arrangements of buildings and complex infrastructure. Associated with these are former quarries, coal spoil tips, rail networks, and surface drains. Notable elements of the landscape today are the leats and ponds of the Dowlais Free Drainage System (DFDS). This was a complex mechanism for collecting together surface rain runoff and underground mine waters and delivering it to the Dowlais Iron Works. Rhaslas Pond is the largest of the reservoirs and one of the oldest elements of the DFDS. Some leats of the DFDS still support drainage of the landscape.

The project site is rich in archaeological remains, especially from the industrial period, many of which have a surface expression that help to create the distinctive landscape. The archaeological remains have been assessed to determine their function, character, age, cultural value and likely condition. The only site of National Importance within the Nant Llesg site is Rhaslas pond. It is currently not scheduled although Cadw has expressed an intention to schedule the southern embankment (not the northern embankment which is considered to be of lesser value given its degraded reworked condition).

In total, the site was found to have some 298 cultural heritage assets of varying importance.

16.3 Mitigation

An archaeological programme for mitigating adverse impacts of the scheme would be developed in consultation with Caerphilly County Borough Council.

Where possible, the programme would support in situ preservation of significant archaeological remains (i.e. preserved where they lie). There would be 'added value' opportunities, principally related to the areas outside topsoil stripping, mostly to the east and west of the central area for mining excavation and spoil mounding.

Where in situ preservation cannot be achieved, and assets have to be removed, then there would be a programme of archaeological field work carried out as follows:

- Excavations and recording at times when mine shafts and adits are being made safe;
- Major and minor archaeological excavations prior to and integrated with top soil and subsoil stripping;
- A watching brief during the scheme. This is when a qualified archaeologist surveys areas as they are excavated to 'watch' for and report on any unearthened finds.

The northern embankment of Rhaslas pond would be fully investigated before being removed and the materials stored on-site for use in the restoration design for this part of the site. On completion of the project the southern embankment would be incorporated within the restored landscape. The northern embankment would not be reinstated but would be commemorated in the landscape to the north of the wetland with materials from the original stone armouring used to depict its original outline.

16.4 Use as a Cultural Heritage resource

In addition to the programme of mitigation the scheme would support activities that would have beneficial effects to cultural heritage concerns including:

- Use of Miller Argent facilities for school education;
- Undertaking community-based archaeological excavations;
- Running an experimental project with schools addressing preservation of archaeological artefacts – this would be by burying new objects in controlled environments and later carrying out archaeological excavation recovery for scientifically assessing their condition;
- Incorporating in situ remains and reconstructions within the restored landscape, supporting 'Place Making'.

16.5 Predicted Effects

Given this programme of mitigation there would be no significant residual adverse effects on the cultural heritage of the site and permanent minor to moderate beneficial effects due to the 'added value' research, data accumulation, publication of findings and educational uses of the programme of archaeology results. No significant cumulative effects have been identified.



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17.1 Overview

Landscape and visual impact are related but separate topics:

- Effects are assessed on the landscape as a resource; how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character, and the key characteristics that contribute to it.
- Effects on visual amenity arise from changes in the content and character of the views that people have of the landscape and the overall pleasantness of the views they enjoy of their surroundings.

The Landscape and Visual Impact Assessment (LVIA) establishes the existing conditions for the landscape context and visual amenity, and identifies potential effects on features and aspects of the landscape and on views of the site.

The study area for the LVIA includes the site itself and extends up to 5km from the site boundary.

17.2 Existing conditions - Landscape

The site is located on a broad ridge between the Fochriw Road to the west and the upper slopes of the Rhymney Valley to the east. The ridge falls gently north, to enclosed agricultural land, then falling more steeply towards the A465 heads of the Valleys Road. To the south, the land rises to Mynydd Fochriw. It is largely on open land, with enclosed fields bordering its northern and eastern edges. The majority of the site is urban common as shown on the CROW access maps, and is crossed by several public rights of way including the Rhymney Valley Ridgeway Walk on a north-south alignment in the eastern part of the site.

17.3 Existing conditions – Visual Amenity

In order to assess the visual effects of the development proposals, the geographic extents within which views may be available of the features of the proposed development were computer generated. They show both the existing and likely views of:

- The main areas from which the overburden and screening mounds would be visible;
- The overburden and screening mounds would themselves screen visibility of the operational void from the south and south-west, and the existing mounds at Ffos-y-Fran would screen views from further west.
- From some locations, views of features of the proposed development would become visible once the storage mounds at the Ffos-y-Fran site would be removed.

Landscape & visual impact assessment



View from Upper Rhymney without screening bund



View from Upper Rhymney with screening bund

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17.4 Mitigation

Remediation and restoration of operational areas would aim to mitigate and/or offset adverse landscape and visual effects and achieve benefits to the landscape character and amenity for local communities in the long term through:

- Early treatment of the eastern, southern and western margins of the site to enhance the existing landscape, providing additional access and information to improve people's connection with landscape, wildlife, and heritage early in the development timeframe.
- Re-establishing the open upland character of the main operational areas of the site, with a variety of habitats, integrating features of historic interest or marking their locations, incorporating new features from this development (with potential for a "heritage trail"), restoring and enhancing public access to the area, reinstating the Bent Iron as a landmark and add other landmark or way-marking features, information signs, seats etc.

Before the site layout was finalised, initial studies showed that the excavation void would be visible from the west facing slopes of the Rhymney valley and the rising land to the north and further to the north-east and, as the void progressed eastwards, it would become visible from areas further to the south-east. Therefore, the site design was amended to include a screening mound along the eastern and northern edges of the area of extraction, which would reduce the areas, especially in Rhymney, from where the void would be visible (see before and after images on page 38).

The construction of the screening bund and overburden mound will be planned in a manner that will minimise the short term effects during construction of the mound by constructing the outer edge of the mound first and then back-filling to complete the screen mound behind the outer face. The screening bund will be constructed during the first 4 months of excavation works.

17.5 Predicted Effects – landscape

In the parts of the site that lie within the main operational area, the landscape effects are assessed as medium to long term and adverse during operations, of Major or Major to Moderate significance. Smaller scale operations are proposed in parts of the site outside the main operational area to the east, south and west to remediate old mine hazards and enhance landscape features and character, and the ecological and heritage aspects of the landscape. These would result in Minor short term adverse effects during the remedial operations, but with long term benefits of Major significance.

The comprehensive restoration strategy for the whole site, would integrate future land use, public access and amenity for local communities, nature conservation and cultural heritage, with a landscape character appropriate to the location and context. The restoration strategy would be implemented progressively as operations proceeded. The landscape effects would be long term, beneficial, of Moderate significance in the operational area and long term, beneficial, of Major significance in the remediation area.

17.6 Predicted Effects - Visual

The main areas from which the development would be visible would be along the Rhymney Valley and onto the uplands to the north, and on the ridges to the east, north-east and south. The overburden mound would screen visibility of the operational voids from the south, especially from Fochriw and the design of the screening mound along the eastern and north-eastern edges of the area of extraction would screen views from much of Rhymney.

Visual effects would vary during the lifetime of the development, and depending on the relative elevation, distance and angle of view, from Major significance in near views during the periods of greatest change, when overburden and screening mounds were being constructed, reducing to Moderate or Minor significance for more distant viewers. The remedial and landscape enhancement works on the eastern valley side were assessed as being of Moderate beneficial significance in the long term when compared to the existing conditions for viewers from the Rhymney conservation area.

18.1 Overview

International legislation affecting the handling of waste during the scheme includes the European Waste Framework Directive 2008/98/EC, implemented by the Waste (England and Wales) Regulations 2011, and the European Mining Waste Directive 2006/21/EC. The proposals for reuse of materials on site and the instigation of a Material Management plan mean the scheme would comply with the objectives set by these directives.

Waste is defined in Section 75 of the Environmental Protection Act 1990 by reference to Article 3.1 of the Waste Framework Directive 2008, namely “any substance or object which the holder discards or intends or is required to discard”.

The project aims to focus on the on-site recovery of waste. Where waste is to be removed offsite for disposal to landfill, Waste Acceptable Criteria (WAC) testing is to be undertaken in order to correctly determine the appropriate waste treatment facility.

The Nant Llesg Surface Mine including Land Reclamation scheme is expected to generate various waste streams during the different stages of works; with key waste streams produced during enabling works and during stages one to five.

Key receptors identified as being susceptible to waste impacts are controlled waters, construction workers and businesses and residents along any waste haulage routes.



18.2 Existing conditions

Ground investigations on site have identified contamination within an inert landfill to the east of Rhaslas Pond. This landfill is owned by Merthyr Industrial Services (MIS) and comprises two segregated areas. An area outside of the permitted landfill boundary is also believed to contain landfilled materials. Through liaison with NRW and necessary remedial works, it is intended to surrender the landfill permit prior to the commencement of works on site.

18.3 Mitigation

Human health risks to construction workers from potentially harmful landfilled materials within the MIS landfill can be mitigated through the correct use of PPE and best practice working methods. It should also be noted that exposure of construction workers to these materials would be temporary, thus the human health risk posed by these materials is considered to be negligible. Similarly, risks to human health from management of waste streams during stages one to five shall be minimised through best practice operational procedures and these risks are also considered to be negligible.

The bulk of exported waste from the scheme would likely be delivered to the adjacent Trecatti landfill site and would therefore not pass any businesses or residents within the site vicinity. A small quantity of hazardous waste (e.g. generated from the MIS landfill) would be delivered to the appropriate disposal point in Swindon, passing one residential property before accessing the A465 Heads of the Valleys Road and subsequently travelling along major trunk roads and motorways. Best working practices would reduce the risk of odours and spillages. Alongside best practice working methods, the implementation of a Material Management Plan for the scheme would specify the appropriate waste storage, disposal, haulage and handling measures to be undertaken on site. The scheme would thus be compliant with relevant planning policies and legislation.

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18.4 Predicted effects

Some of the landfilled materials to the north of the licenced MIS landfill would require excavation and removal. Consultation with NRW shall be undertaken to ensure suitable waste removal and stabilisation of residual wastes is undertaken to facilitate surrender of the permit. Materials identified during ground investigation at the MIS landfill include asbestos and biodegradable material, which would require careful handling by appropriately qualified personnel.

Preliminary operations and subsequent land remediation works are expected to generate minimal waste streams, which would mainly consist of the removal of apparatus associated with the existing land uses across the site (e.g. agriculture and former mine adits).

Coaling works through stages one to four would generate the key waste streams of the scheme; predominantly from plant maintenance (at the workshop area) and process water treatment silt (at the barrel wash, Cwmbargoed Disposal Point product wash and water treatment areas). This would be inert waste, as defined by the mine waste Directive.

The final restoration and aftercare stages are not anticipated to produce any significant waste streams as major works comprise redistribution of overburden material and topsoils across the voids created by the preceding surface mining operations. Opportunities for recycling, e.g. offices, fencing and site accessories, are to be utilised where possible during this stage. Temporary concrete hardstanding on site is to be broken up, crushed and sent off site for reuse. This would aid the minimisation of waste during this stage of the scheme.

The Cwmbargoed Disposal Point is to be removed and restored as part of the works. This is likely to generate a large waste stream in the form of plant, machinery and demolition materials all of which would be reused where possible.

On-going consultation with NRW would determine the necessary materials and volumes to be removed from the area of the MIS landfill as part of the landfill permit surrender process.

The removal of material from the MIS landfill and the proposed reduction in the size of Rhaslas pond would reduce the potential for horizontal / vertical migration of leachable contaminants from the MIS landfill; the significance of the risk to proximal controlled waters from the MIS landfill is therefore considered as minor. Risks posed to controlled waters from waste streams generated during stages one to five (e.g. sediment) would be mitigated by the production of a surface water management plan as detailed in the Hydrology Assessment. The residual risk is therefore considered to be minor.

Health & welfare

A Health Impact Assessment was carried out to investigate and address the potential impact of the Nant Llesg scheme. The scope and focus of the HIA built upon experience at FLRS and was defined and iteratively refined through engagement with key stakeholders and local communities through an integrated engagement strategy and is in compliance with national guidance provided by WHIASU

The assessment drew from and built upon the technical outputs of the ES to investigate each of the potential health pathways directly associated with the mining, remediation and final restoration stages of the proposed Project.

The principal community health concern raised during public engagement was the potential risk from changes in air quality. Following a review of the available scientific evidence base and based on an exposure response assessment of worst case hypothetical scenarios applying the highest burdens of poor health in the area, it is concluded that changes in concentrations of PM₁₀, PM_{2.5} and NO₂ air pollutants would remain within air quality standards set to protect health and would not be of a magnitude sufficient to quantify any significant adverse health outcome. Such a conclusion is consistent with the findings from FLRS, where monitoring data has remained within all air quality standards set to protect health since the start of operations.

Concerns of dust impacts were also voiced. The proposed project seeks to draw from and build upon the experience and dust management best practice established at FLRS (categorised as a Low Dust Risk within its permit to operate from Caerphilly Borough Council (2012) and Merthyr Tydfil Borough Council (2013). Following mitigation, and the provision of additional dust monitoring stations, potential dust impacts are predicted to also be minor, and not of a level to result in any measurable adverse health outcome.

Concerns of visual impact were also voiced, and primarily addressed through design by pulling the mining area away from the settlement boundary and through the inclusion of a visual and acoustic bund at a cost to the mining area.

Following the extraction of coal, the proposed remediation work would help to address existing environmental hazards including making safe disused mine shafts, remediating old coal tips, inspecting and treating the Merthyr Industrial Services inert landfill site and removing old underground workings to reduce the mine water pollution that presently discharges into the River Rhymney. This work would benefit the surrounding area with a final reclamation scheme that makes positive changes and helps to meet the needs of the local community.

A comprehensive education, training, employment and procurement strategy is proposed, alongside on-going community support initiatives and community benefit fund to address local circumstance, barriers to benefit uptake, and to support local health improvement.

On the basis that all regulatory environmental standards set to protect health have been achieved at FLRS, and are predicted to be achieved at Nant Llesg; that the assessment from relative changes in air quality, noise and transport upon existing burdens of health are not sufficient to quantify any adverse health outcome; and when considering the approach proposed to address community concerns, perceptions and priorities; operational procedures; and the commitment for on-going community engagement, the proposed project does not constitute a significant risk to local community health.

When further considering the significant underlying factors defining local burdens of poor health in the area (largely socio-economic and lifestyle related), and the direct, indirect and induced socio-economic benefits from the proposed project, the immediate and final land reclamation (removing existing environmental hazards and supporting regeneration) and the catalogue of committed community support initiatives (summarised within the HAP) to optimise local health benefit uptake, the proposed project is considered to constitute a net health benefit.

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20.1 Sustainability

Sustainability is an important element of Miller Argent's proposal for the Nant Llesg scheme, and the proposed design and operations have been developed to ensure that the three pillars of sustainability: social, economic and environmental outcomes, are promoted.

During the development of the project proposals, the project was reviewed against a series of sustainability objectives, termed the 'sustainability framework'. This highlighted areas where changes could be made to the project design in order to enhance the contribution being made to sustainable development. Such changes were therefore made iteratively during project design. The framework was also used to demonstrate that the scheme complies with relevant policies for sustainability promoted at relevant national, regional and local levels of Government.

Overall, the sustainability framework demonstrates how sustainable development has been integral to the planning of this project, and how it would be delivered during the construction, operation and eventual decommissioning of the proposed facilities

20.2 Climate change

Climate change is widely acknowledged as the most pressing challenge for sustainable development and the project has included consideration of necessary climate change mitigation (i.e. proposals to minimise the impact of the project on climate change) and also adaptation to changing climate, (i.e. how the project activities will respond to any changes that occur in the climate during the life of the project).

In terms of climate change mitigation, the following has been proposed:

- Maximising fuel efficiency in mine design and operation, significantly reducing carbon emissions associated with the extraction of coal;
- Carbon emissions associated with both transportation of the coal, and also use of transport by employees working at the site will be minimised;
- Soil handling methodologies will be followed to ensure the soil is appropriately management in order to reduce the potential for carbon emissions release.
- Tree planting proposals have been included which form part of the ecological enhancement at Bryn Caerau and are included in the restoration strategy. This will offset the methane emissions associated with the extraction of coal.

In terms of adaptation to a changing climate, the following is included within the Nant Llesg scheme:

- The potential for changes in the baseline conditions as a result of climate change has been included within the ecological assessment;
- A Surface Water Management Strategy has been proposed which sets out how this will make appropriate allowance for the potential increases in rainfall or severe storm events due to climate change.
- Local weather conditions will be closely monitored and a range of dust mitigation measures have been proposed for adoption in the event of a drought.

Cumulative effects

The EIA Regulations and Welsh Planning Policy confirm that developments within a local area need to be considered in combination in order that cumulative effects would not lead to increased environmental impacts.

Other developments which are existing within 5km of the proposed Nant Llesg project or likely to take place during the life of the Nant Llesg development include the existing Ffos-y-fran Land Reclamation Scheme, Trecatti Landfill, and the recently permitted NET Wood Pellet Plant at Rhymney. The area of the existing CDP which lies outside the application boundary and sits within the Borough of Merthyr Tydfil is also included within the cumulative effects assessment. Timescales vary between the developments, e.g. Trecatti Landfill commenced in 1999 and is likely to continue beyond the life of Nant Llesg, while FLRS commenced in 2007, and would be completed three years before Nant Llesg; NET is likely to commence operation in 2014 and to continue indefinitely.

The cumulative assessment concludes that there are very few cumulative effects. Those identified include:

Cumulative effect	Impact significance
Loss of urban common resource for recreational use	Long term, temporary, adverse minor/moderate significance
Loss of urban common and the agricultural use of it	Long term, temporary, adverse minor/moderate significance.
Disruption to Public Rights of Way	Long term, temporary, adverse minor significance
Dust deposition from the removal of the FLRS overburden mound	Temporary, adverse minor significance
Cumulative landscape feature (alongside FLRS) for a period of 8 years (general landscape)	Medium term, adverse minor/moderate significance

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The ES has been prepared in order to assist in reaching a decision as to the merits of the proposed development and the environmental implications associated with it. The ES summarises the results of very careful, detailed and systematic research into each of the potential environmental effects of the development and, where relevant, sets out modern and well-designed methods of mitigating the effects. Wherever possible, mitigation measures to reduce the magnitude of adverse effects have been integrated into project design or alternatively proposed for implementation during site establishment, operations and restoration.

The general conclusion reached by the ES is that there are adequate mitigating measures available to ensure that the development can proceed without giving rise to unacceptable environmental effects. It also demonstrates that the proposed scheme brings about a number of substantial community benefits, including:

- remediation of historic mining dereliction associated with the treatment of mining shafts and adits which will improve public amenity and create safe conditions for public access to extensive areas of land;
- restoration of land to open mountain grassland, interspersed with woodland belts and a substantial package of new paths as a public amenity;
- improvement in the second worst mine water discharge in Wales which is unlikely to be rectified with public funds in the absence of the scheme;
- improvement in the run off of siltation to the lake in Darran Valley Country Park;
- improvement of visibility along the southern approach to the junction of Bogey Road and Fochriw Road to improve highway safety;
- remediation and/or removal of waste from the MIS landfill;
- a superior restoration of an area previously subjected to former and somewhat pioneering 'opencast' mining;
- the creation of areas of nature conservation (and geo diversity conservation) as part of the restoration scheme, together with substantial off site biodiversity benefits at the Bryn Careau area; and
- demonstrable employment and economic benefits associated with direct and indirect employment and the overall contribution to the local economy.

In a wider context the accompanying Planning Statement concludes that the development can proceed in terms of the requirements of national and local planning policies for the area.

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Chapter 1

Introduction

Environmental
Statement Volume I:

Technical
Assessments Part 1

Nant Llesg Surface Mine

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Environment Statement

Chapter 1 - Introduction

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1 Introduction

- 1.1 Miller Argent (South Wales) Limited (“Miller Argent”) of Cwmbargoed Disposal Point, Fochriw Road, Cwmbargoed, Merthyr Tydfil CF48 4AE (“the Applicant”), is applying for planning permission to develop the ‘Nant Llesg Surface Mine, Incorporating Land Remediation’ on approximately 478.1 of land west of Rhymney in the County Borough of Caerphilly.
- 1.2 ‘Nant Llesg’ was originally identified as a prospective opencast site by former British Coal Opencast on their ‘Consultation Plans’, as provided to local authorities. In June 1994 in the run-up to privatisation of the coal industry, Nant Llesg was identified in the prospectus of British Coal as a ‘Prospective Opencast Site Coal Reserve’ with significant reserve.
- 1.3 In 1997, Miller Argent acquired the majority of land and mineral interests in the Ffos-y-fran and Nant Llesg sites and has since proceeded to develop the schemes. The Ffos-y-fran Land Reclamation Scheme started coal production in 2007 and is scheduled to do so until 2022. It is now proposed that the Nant Llesg Surface Mine be developed to supplement that production and help meet the demands of the current market.
- 1.4 This Environmental Statement accompanies the planning application and is submitted under Town & Country Planning (Environmental Assessment) (England and Wales) Regulations 1999, as amended in Wales (“the EIA Regulations”). The proposal is ‘Schedule 1 Development’ under the EIA Regulations, being opencast mining where the surface area of the site exceeds 25 hectares.
- 1.5 The Mineral Planning Authority was formally requested to adopt a scoping opinion under Regulation 10 of the EIA Regulations on 6th June 2011. In accordance with the provisions of Regulation 12 of the EIA Regulations, the Authority was simultaneously and formally informed that an Environmental Statement is being submitted with the planning application. A scoping opinion was subsequently adopted by the mineral planning authority on 26th August 2011.
- 1.6 Environmental assessment being an iterative process, a revised scheme was submitted along with a corresponding Scoping Report on 31st December 2011, together with a request for the mineral planning authority to review its scoping opinion. A revised scoping opinion was adopted on 9th March 2012 (see Appendix MA/NL/ES/A01/001).
- 1.7 Following further pre-planning and community consultations and on-going environmental assessment, substantial revisions were made to the proposed development and the mineral planning authority were requested to once again consider their scoping opinion in light of the changes. They were asked to advise whether any significant environmental effects could be identified that were not included in their previous scoping opinion. On 23rd August 2012 the Mineral Planning Authority confirmed that it did not foresee any new issue being raised by the amendments.
- 1.8 This Environmental Statement has been prepared accordingly and no further submission is anticipated unless specifically requested by the mineral planning authority.

Site Location and Site Boundary

- 1.9 The proposed development site boundary is identified in Planning Application Drawing MA/NL/PA/001 and its location is indicated on Planning Application Drawing MA/NL/PA/002.

- 1.10 The planning application site lies to the west and south west of Rhymney and to the north and west of Pontlottyn and Fochriw in the County Borough of Caerphilly. It consists primarily of upland urban common land and agricultural grazing land on the western side of the Upper Rhymney Valley area.
- 1.11 Immediately east of the planning application site boundary lie the Heads of the Valleys Industrial Estate and the Capital Valley Industrial Estate. The roads to the west of these industrial estates mark the western limit of the Rhymney settlement boundary with the residential area of Rhymney lying approximately 300m further east. The western application boundary is defined by the unclassified road known as 'Fochriw Road', which runs northwards over the common from Cwmbargoed towards the A470 Heads of the Valleys Road.
- 1.12 The northern extent of the site generally follows a line just south of the 'Nant Carno' watercourse. The southern limit of Nant Llesg Surface Mine is largely defined by South Tunnel Road, which is an unclassified road over the Gelligaer and Merthyr Common (CL38) that runs east-south-eastwards towards Fochriw and Pontlottyn.

Overview of the Proposed Development

- 1.13 The proposed development is to work the 'Nant Llesg Surface Mine, Incorporating Land Remediation' over approximately 478.1ha of land in the County Borough of Caerphilly. This would be done with plant, infrastructure and buildings to;
- mine approximately 6 million tonnes of coal from the land using surface mining methods;
 - facilitate the remediation of land within and adjacent to the surface mine to address public safety and land drainage concerns;
 - carry out road improvement works at the junction of Fochriw Road and Bogey Road and at the access points to Cwmbargoed Disposal Point along the Bogey Road;
 - carry out works to protect the southern embankment of Rhaslas Pond, remove the northern embankment and infill approximately 50% of the pond (a reservoir under the Reservoirs Act 1975);
 - erect a new building at Cwmbargoed Disposal Point and install within it a new coal washing plant to prepare coals that arrive at the disposal point from the Nant Llesg Surface Mine and the Ffos-y-fran Land Reclamation Scheme;
 - Install a water recycling facility west of the railway line at the Cwmbargoed Disposal Point in order to supply water to the new coal washing plant;
 - continue the use of all facilities at Cwmbargoed Disposal Point for the duration of coal working operations at the Nant Llesg Surface Mine to prepare, process and dispatch to market coal from the Nant Llesg Surface Mine in addition to its current use;
 - progressively restore the land in accordance with the proposed restoration strategy and rehabilitate the restored land for a minimum five-year aftercare period.
- 1.14 Full details of the proposal are set out in Chapter 4 of the Planning Statement, which should be read in conjunction with this Environmental Statement; the accompanying Health Impact Assessment; Sustainability and Carbon Statement; Community Consultation Statement; associated supporting documentation and drawings to fully understand the proposed development and the impacts that are environmentally assessed in this statement.

- 1.15 All coal from the mine would be processed and dispatched to market via the existing Cwmbargoed Disposal Point, to the south-west of the mine, within which a new building would house a new coal washing plant to prepare coals arriving at the disposal point from the Nant Llesg and Ffos-y-fran surface mines and render them suitable to meet the needs and specifications of the market prior to dispatch by road or rail.
- 1.16 The bulk of the coal would be dispatched by rail. There is currently a 50,000 tonne per annum limit on coal transported by road from the Ffos-y-fran surface mine via the CDP. This limit would not change with the introduction of the Nant Llesg mine, other than it is proposed that the restriction be applied as a maximum combined tonnage to be dispatched by road via the CDP from both surface mines.
- 1.17 In addition to the land remediation works that would be carried out within the operational area of the surface mine as a consequence of mining activity, additional areas of land have been included within the planning application site boundary to carry out further land remediation works in areas surrounding the mine. Such additional works are not associated with the mine but represent a community benefit as part of the overall scheme. Further details of these works are set out in Chapter 3: The Nant Llesg Project.

Need for the Coal

- 1.18 The need for the coal is set out at Chapter 15 of the Planning Statement, 'The Need for the Coal'.
- 1.19 The conclusion is that the need case for Nant Llesg coal is exceptionally strong. The Nant Llesg Surface Mine represents a coal resource of national importance. The resource is uniquely important and is the subject of strong, evidenced demand from both the principal power generator and the principal steel manufacturer in Wales, not just as a fuel source, but as a key part of a metallurgical process in the case of steel manufacturing. Its quality and scarcity mean that it is important both to the continued success of those companies but also to the future of the Welsh economy and the Welsh coal mining industry.
- 1.20 This need case demonstrates the severe shortage of supply compared to demand and the overriding need for an additional large scale resource to be consented. The rapidly dwindling supply of Welsh steam coal requires new resources to be identified now in order to meet demand, reduce imports and provide the necessary confidence on which important anchor companies in Wales can make key investment decisions. Planning policy requires the best use to be made of indigenous resources and each planning authority is required to play its part in meeting local, regional and UK needs.

Nant Llesg Surface Mine

Incorporating Land Remediation

Chapter 2

Environmental Impact Assessment

Nant Llesg Surface Mine

Incorporating Land Remediation

Environment Statement

Chapter 2 - Environmental Impact Assessment

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2 Environmental Impact Assessment

Introduction

- 2.1 Environmental Impact Assessment (EIA) is the process of drawing together, in a systematic way, an assessment of a projects likely significant environmental effects that must be followed for certain categories of project before they can be considered for ‘development consent’; in this case ‘planning permission’.
- 2.2 The aim of EIA is to assess the likely significant environmental effects of the project and to present the importance of these effects, together with the proposed measures for reducing or enhancing negative or beneficial effects respectively. The assessments set out within the EIA need to be appropriately understood by the public and by the relevant determining authority before it makes a decision on whether to grant planning approval.
- 2.3 The EIA process results in information about the proposed development along with its associated environmental effects being presented within an Environmental Statement (ES) for the consideration by the determining authority in deciding whether planning permission should be granted. The EIA process itself has a number of key characteristics including:
- Systematic – the EIA is comprised of a series of tasks that are defined by both regulation and practice;
 - Analytical – the assessments require the application of specialist skills and experience from the environmental sciences;
 - Impartial – the EIA must be used to inform the decision making rather than promote the project itself;
 - Consultative – the EIA process must allow for and provide opportunity for interested parties and statutory consultees to provide feedback on the project and assessments undertaken;
 - Iterative - the EIA process should allow for environmental concerns to be addressed during the planning and design stages of the project.

Regulatory Context

- 2.4 The legal requirement for EIA is set out within the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, as amended in Wales (“the EIA Regulations”), which implement European Communities Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (codification). Schedule 1 of the EIA Regulations lists those developments for which EIA is mandatory, whilst Schedule 2 sets out the projects for which the need for EIA is determined on a case by case basis at the discretion of the planning authority through the screening process.
- 2.5 The application for the Nant Llesg Surface mine, incorporating land remediation, is classified as Schedule 1 development under the EIA Regulations and therefore requires EIA. Environmental information about the project must be provided by the developer within an Environmental Statement (ES). Schedule 4 of the EIA Regulations sets out the information that should be

provided in the ES. This is outlined in Table 2.1 below together with details of where this information can be located within this ES.

Table 2.1 Schedule 4 Information Requirements

Schedule 4 Requirement	Assessed/Included in this ES
A description of the development	Chapter 3
An outline of the main alternatives studied	Chapter 4
A description of the aspects of the environment likely to be significantly affected by the development including, in particular, population, fauna, flora, soil, water air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.	Chapters 5 - 19
A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary development.	Chapters 5 - 19
A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment	Chapters 5 - 19
Non-technical summary	To be included within this ES and also as a stand-alone document.
An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.	Included within the topic assessment chapters, Chapters 5 - 19

EIA Scoping

- 2.6 Scoping is the process of identifying the potential environmental issues that should be included and assessed within the EIA. This recognises that there may be some environmental elements that will have no likely significant effects and therefore will not be necessary to include within the EIA.

- 2.7 A formal Scoping Request was initially submitted to CCBC on 6th June 2011 with a scoping opinion being subsequently adopted on 26th August 2011.
- 2.8 As a result of the iterative environmental assessment process, a revision to site design resulted in a revised scheme being submitted, along with a corresponding Scoping Report on 31st December 2011 with a request for the Mineral Planning Authority to review its scoping opinion. A revised scoping opinion was adopted on 9th March 2012.
- 2.9 Following further pre-planning and community consultations and on-going environmental assessment, further substantial revisions were made to the proposed development and on 30th July 2012 the Mineral Planning Authority was requested to consider for a third time its scoping opinion in light of the changes and to advise whether they considered there would be any further significant environmental effects that were not included in the previous scoping opinion.
- 2.10 The revised scheme included development within Cwmbargoed Disposal Point, which lies partly within the County Borough of Merthyr Tydfil. However, further review of the proposals resulted in no new development being proposed within the County Borough of Merthyr Tydfil and on 15th August 2012 the intended application site boundary was withdrawn to exclude the land within Merthyr Tydfil and the Mineral Planning Authority advised accordingly.
- 2.11 On 23rd August 2012 the Mineral Planning Authority confirmed that it did not foresee any new issue being raised by the amendments.

Assessment Methodology

- 2.12 Once the scope of the EIA has been established, individual environmental topics are subject to survey and investigation to establish the baseline conditions that exist before the development proceeds. This is followed by assessment to identify and predict the significance of the likely environmental impacts of the proposed development. The assessment methodologies applied are based on recognised best practice and guidance specific to each topic area; relevant details of assessment methodologies are provided in the appropriate assessment chapters of this ES.
- 2.13 The technical studies that have been undertaken for each topic area have generally followed the same approach:
- Collection and collation of existing baseline information of the study area in addition to any supplementary survey work required to fill any data gaps or to update any outdated information;
 - Frequent consultation with both internal specialists within the team and relevant external consultees. This has been both within and across topic areas;
 - Consideration of the potential effects of the proposed development on the existing baseline, followed by identification of possible design changes that would lead to the avoidance or reduction of predicted adverse effects (and likewise the enhancement of any positive effects);
 - Assessment of the final scheme design and evaluation of the significance of any residual and cumulative effects; and
 - Compilation of the ES chapter.
- 2.14 Many of the environmental effects are relevant to more than one topic area and therefore attention has been paid to the interrelationship between them and referenced accordingly. For

example, there will be secondary effects on ecological resources/receptors as a result of changes to hydrological regimes. These will be assessed within the ecological assessment with a cross reference to the direct effects within the hydrology assessment chapter. Another example is the cultural heritage assessment which has input from the landscape and visual assessment.

2.15 In general the ES assessment chapters have followed the same general format set out below, although there is variation between topics:

- Introduction - presents the potential scope of assessment and sets the general scene for the topic;
- Methodology – a description of the methods used to establish the baseline conditions, identify the likely effects of the proposed development and the assessment of their significance. Details of any consultations are generally included in this section;
- Baseline environment – describing the current state and circumstances of the receptors and changes that might reasonably be expected to occur if the proposed development was not implemented;
- Data limitation – a description of any survey and/or data limitations;
- Seasonal/temporal change - refers to seasonal change in baseline conditions, where appropriate;
- Medium and long term temporal change – the potential for the future baseline to differ from that surveyed. Consideration is given to whether the baseline is likely to change over the project lifetime or during periods considered in the assessment;
- Assessment criteria and assignment of significance - a description of the approach taken to identify the magnitude of an impact, the sensitivity of a receptor and how these combine to result in an assigned significance;
- Design mitigation – mitigation that has been included within the design of the development, i.e. are part of the proposed scheme and measures not required to be secured through legal agreements or planning obligations;
- Potential effects of the scheme – this is an assessment of the significant environmental effects of the scheme as set out in Chapter 3: The Nant Llesg Project, i.e. the development inclusive of design mitigation (i.e. mitigation that is incorporated as part of the project design to avoid or reduce effects). Effects are considered for site establishment, site operation and site restoration stages of the proposed development which includes a number of various scenarios:
 - Site establishment operations;
 - Land remediation works;
 - Surface mining operations;
 - Operations at Cwmbargoed Disposal Point;
 - Decommissioning of Cwmbargoed Disposal Point;
 - Restoration of the land; and
 - Aftercare

- Prevention and mitigation – measures which would be implemented to avoid, reduce, control, manage or compensate for potential significant effects. Measures included to mitigate environmental effects would be in addition to those already included in the design to comply with non-environmental legal requirements. Enhancement measures would also be set out;
- Survey and monitoring – recommendations for any surveys or monitoring that should be undertaken before and during mining operations and post restoration;
- Residual effects – an assessment of the significance of the effects likely to arise as a result of the proposed development following implementation of any mitigation measures;
- Cumulative effects – an assessment of significant environmental effects that may arise alongside or incremental to other developments which are in planning, consented or operational.
- Statement of significance – a short statement on the overall effects and the assessed significance for the topic;
- References

Identification and Significance of Effects

- 2.16 The EIA Regulations set out the information to be included in an environmental statement, including the aspects of the environment likely to be significantly affected by the development; a description of the likely significant effects of the development on the environment; and a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.
- 2.17 Developments may affect different environmental elements to varying degrees, and not all impacts arising from a development are of sufficient concern to require detailed investigation or assessment within the EIA process.
- 2.18 Within each chapter, definitions are given for what environmental receptors (or receiving environments) are being assessed along with a description of what changes the proposed development are likely to cause the affected receptors. The magnitude (or scale) of these changes is defined.
- 2.19 In broad terms, significance can be said to be a function of:
- Resource value (international, national, regional and local level importance);
 - Magnitude of effect, (either adverse or beneficial)
 - Timescales involved (temporary or permanent); and
 - Receptor sensitivity.
- 2.20 Professional judgement, along with relevant and accepted guidance is used within each assessment chapter to assess the interaction between receptor value (i.e. its importance or sensitivity) and the predicted magnitude of change to identify whether an effect is significant and what level of significance should be assigned (e.g. high, medium, low or negligible significance). In some cases this is based on quantitative assessment whereas in others, it is only possibly to use professional judgement and qualitative descriptions. In all cases, clear

justification for the assessment approach has been set out along with all assumptions and limitations.

Cumulative Effects

- 2.21 Cumulative effects are those that result from incremental changes caused by other past, present or reasonably foreseeable actions/developments, in combination with the proposed development. Cumulative effects may result in effects that are more than, or less than the sum of the individual effects. For the purpose of this assessment these have included consideration of effects related to:
- Ffos-y-fran Land Reclamation Scheme;
 - Areas of Cwmbargoed Disposal Point outside the planning application boundary and within the County Borough of Merthyr Tydfil;
 - Trecatti Landfill Site; and
 - Wood Pellet Facility located at Capital Valley Eco-Park, Rhymney
- 2.22 Where appropriate, the study area for the cumulative assessment of each environmental topic is set out in the relevant chapter.
- 2.23 Drawing MA/NL/ES/02/001 shows the location of the developments included in the cumulative assessments.

Assumptions

- 2.24 It has been assumed that information provided by third parties, including publically available information and databases is correct at the time of publication. Assumptions specific to certain environmental aspects are discussed in the relevant topic assessment chapters of the ES.

Project Team

- 2.25 Miller Argent (South Wales) Limited has engaged a range of environmental specialists to provide advice on the working and restoration scheme, and to identify and address the potential environmental issues which might arise. As part of the EIA process, the team has obtained advice from Caerphilly County Borough Council and other consultees on the issues which should be assessed as part of the EIA and ensured that they have been comprehensively addressed as part of the reiterative design and environmental assessment of the scheme.

2.26 The Nant Llesg Project Team is set out in the following Table 2.2:

Table 2.2 – Nant Llesg Project Team

Topic	Lead Consultant	Address
Planning	Graham Jenkins	SLR Consulting Fulmar House Beignon Close Ocean Way Cardiff CF24 5HF
Social Impact Assessment	Dave Lawrence	Roger Tym & Partners 7 Soho Square London W1D 3QB
Recreation and Tourism	Eunice Stephenson	RPS 20 Milton Park Abingdon Oxfordshire OX14 4SH
Traffic and Transport	Paul Goodenough	Mott MacDonald Group Integrated Transport Division Fitzalan House Fitzalan Road Cardiff CF24 0EL
Ecology and Nature Conservation	Dr Keith Jones	RPS 20 Milton Park Abingdon Oxfordshire OX14 4SH
Agricultural Land Use and Soils	Julia Tindale	RPS 20 Milton Park Abingdon Oxfordshire OX14 4SH
Hydrogeology	Shaun Salmon	AMEC Environment & Infrastructure UK Ltd Partnership House Regents Farm Road Gosforth Newcastle Upon Tyne NE3 3AF
Hydrology and Drainage	Richard Breakspear	AMEC Environment & Infrastructure UK Ltd 155 Aztec West Park Avenue Almondsbury Bristol BS32 4UB

Topic	Lead Consultant	Address
Air Quality and Dust	Dr Claire Holman	ENVIRON UK Ltd Box House Box, Wiltshire SN13 8AA
Noise	Colin English	The English Cogger Partnership LLP 5 Charlecote Mews Staple Gardens Winchester Hampshire SO23 8SR
Blasting and Vibration	Bill Birch	Blastlog Ltd Upton House Market Street Charlbury Oxford OX7 3PJ
Cultural Heritage	Richard Hughes	IHCM, 45 Crescent Lane London SW4 9PT
Landscape and Visual Impact	Mary O'Connor	White Young Green 5th Floor Longcross Court 47 Newport Road Cardiff CF24 0AD
Waste	Andy Lawrence	Mott MacDonald Group Prince House Prince Street Bristol BS1 4PS
Sustainability and Carbon	Charlotte Brewin	RPS 20 Milton Park Abingdon Oxfordshire OX14 4SH
Health Impact Assessment	Dr Andrew Buroni	RPS 6-7 Lovers Lane Brighton East Sussex BN1 6AH

ES Structure

2.27 The ES contains the environmental information that is required by the EIA Regulations and comprises a number of elements that are outlined in the sections below.

Non-Technical Summary

- 2.28 A non-technical summary (NTS) summarises, in non-technical language, the findings of the EIA. This is included within the main ES (Volume I) as well as being available as a standalone document.

Environmental Statement (Volume I)

- 2.29 As listed below, Volume I of the ES (this volume) includes the introductory chapters (1 - 4) and the EIA topic chapters (5 - 19) and the Summary and Overview (Chapter 20):

1. Introduction
2. Environmental Impact Assessment
3. The Nant Llesg Project
4. Site Selection and Alternatives
5. Social Impact Assessment
6. Recreation and Tourism
7. Traffic and Transport
8. Ecology and Nature Conservation
9. Agricultural Land Use and Soils
10. Hydrogeology
11. Hydrology and Drainage
12. Air Quality and Dust
13. Noise
14. Blasting and Vibration
15. Cultural Heritage
16. Landscape and Visual Impact
17. Waste
18. Health and Welfare
19. Sustainability and Climate Change
20. Summary and Overview (including cumulative effects)

Environmental Statement (Volume II): Appendices

- 2.30 Volume II includes the technical reports, figures and drawings that accompany the ES technical assessments.

Environmental Statement (Volume III): Drawings

- 2.31 Volume III includes all the drawings that are referenced within the ES. These include the Planning Application Drawings referred to in Chapter 3 of the ES.

Health Impact Assessment

- 2.32 In keeping with best practice, and as advised by Minerals Technical Advice Note 2: Coal (MTAN2), a Health Impact Assessment (HIA) has been carried out to build upon the technical disciplines of the regulatory Environmental Statement (ES) to further investigate, assess, and address potential community health opportunities and concerns. The key findings of the HIA will be summarised and applied as the basis to a Health and Welfare section within the ES, thereby supporting and informing the planning process and facilitating a more joined up approach to planning, the environment and health.
- 2.33 The full HIA has been submitted with the planning application as a stand-alone document and includes a dedicated Health Action Plan summarising committed mitigation, monitoring and community support initiatives to support local communities and the uptake of potential health benefits.

Sustainability and Carbon Statement

- 2.34 Sustainability is an important element of Miller Argent's proposals for the Nant Llesg scheme and MTAN2 states that "applications for coal working should demonstrate that actions to reduce carbon emissions from the extraction and transport of coal are included in the proposals".
- 2.35 Climate change is widely acknowledged as the most pressing challenge for sustainable development. Recent developments in EIA best practice, including "Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment" (European Commission, 2013) and "IEMA Principles Series: Climate Change Mitigation & EIA" (IEMA, 2010), have indicated that it may be appropriate for climate change to be addressed within the EIA. However, there is still a wide range of opinions on whether this is appropriate, given the global nature of climate change which conflicts with the "Environmental Impact Assessment: A guide to good practice and procedures" (DCLG, 2006) which refers to "*the surrounding environmental features*" when introducing the approach to assessing environmental impacts (Chapter 4, Paragraph 106). There is no guidance currently available on an appropriate assessment methodology for climate change, or how to select an appropriate baseline or significance criteria. Climate change is a global issue and therefore does not easily fit into project level assessments used in standard EIA methodology.
- 2.36 In considering what is important to decision makers, both the EU and IEMA guidance confirm that the focus should be on consideration from the earliest stage of minimising carbon and other greenhouse gas emissions, to minimise the impact of the proposed development on climate change. In addition, appropriate consideration should be given to the consequences of a changing climate. The Nant Llesg project has adopted this approach and chapter 6 of Appendix MA/NL/ES/A19/001: 'Nant Llesg Sustainability and Carbon Statement' sets out in detail how the proposed scheme has minimised carbon emissions arising from both the

extraction and transportation of coal, and how the project has been designed to minimise vulnerability and adapt to a changing climate.

- 2.37 The appraisal of GHG emissions associated with this project has been undertaken within the context that this project is consistent with the Energy White Paper (DTI, 2007) which confirms, in section 5.4, that “coal will continue to play a significant role in global electricity generation for the foreseeable future, partly because it is the most abundant global fossil fuel but also because it brings security of supply benefits”. The reduction of GHG emissions associated with the use of coal in both the energy and manufacturing industries is addressed more widely in the Climate Change Act 2008 and the EU ETS (Emissions Trading Scheme Directive), and is not within the scope of this project.
- 2.38 Appendix MA/NL/ES/A19/001 to this ES has drawn upon other topics within the Environmental Impact Assessment, which have addressed climate change in respect to either climate change mitigation or adaptation as appropriate. Adaptation to a changing climate is also considered by Miller Argent to be important for this scheme and the appendix draws on the aspects of the scheme that have been designed with that in mind.
- 2.39 This Environmental Statement refers to and takes full account of the ‘Sustainability and Carbon Statement’ as part of the Environmental Impact Assessment.

Nant Llesg Surface Mine

Incorporating Land Remediation

Chapter 3

The Nant Llesg Project

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3 The Nant Llesg Project

Introduction

- 3.1 To comply with the requirements of Schedule 4 of the EIA Regulations, this chapter provides a comprehensive description of the proposed development; from site preparation through to site restoration and includes:
- An overview and site layout, providing a description of the physical characteristics of the whole development and the proposed land-use requirements during the site establishment, site operational and site restoration stages. This includes all elements of the scheme including the operational areas of the proposed surface mine as well as land remediation works proposed for the peripheral areas;
 - A description of the main characteristics of the surface mining process, including the nature and quantity of the materials to be handled during the scheme and details of the quality and need for the coal to be won, together with descriptions of the individual elements of the peripheral land remediation proposals;
 - A description of the working practices and programme of the proposed operations;
 - A description of the proposed site restoration and aftercare proposals.
- 3.2 Chapters 5 to 19 of this statement include the environmental assessment of each of the topic headings listed at paragraph 2.29 above, and include estimates of the type and quantity of any expected residue or emission associated with each topic as a result of operations carried out on the proposed development.

Note: *The description of the proposed development that follows in this chapter is a duplication of the description of the proposed development provided at Chapters 2 to 14 of the Planning Statement.*

Description of the Proposed Development

Site Area Components

- 3.3 The planning application site boundary is shown on Planning Application Drawing MA/NL/PA/001 and its location is indicated on Planning Application Drawing MA/NL/PA/002. The land included within the planning application site boundary, edged red on Planning Application Drawing MA/NL/PA/001, covers some 478.1 ha to the west and south west of Rhymney, to the north and west of Pontlloftyn and Fochriw in the County Borough of Caerphilly. It consists primarily of previously mined and industrially disturbed upland urban common land and agricultural grazing land on the western side of the Upper Rhymney Valley.
- 3.4 Immediately east of the site lie the Heads of the Valleys Industrial Estate and the Capital Valley Eco Park. The roads to the west of the estates mark the western limit of the Rhymney

settlement boundary with its residential area lying generally 200 to 300m further east. The western application boundary is defined by the unclassified road known as 'Fochriw Road', which runs northwards over the Gelligaer and Merthyr Urban Common from Cwmbargoed towards the A465(T) Heads of the Valleys Road. The northern extent of the site generally follows the line of the 'Nant Carno' watercourse, which meanders just north of the site boundary. The southern limit of the 'Nant Llesg Surface Mine' is largely defined by South Tunnel Road, which is an unclassified road over the Gelligaer and Merthyr Urban Common that runs east-south-eastwards towards Fochriw and Pontlottyn. Additional land has been included to the east, west and south of the surface mine for land remediation and road improvement works, as have the coal processing and dispatch facilities at Cwmbargoed Disposal Point.

- 3.5 The planning application site area of 478.06 ha is comprised of the five general areas or categories of land set out below; their areas expressed as a percentage of the whole:

Operational Area of Surface Mine

The central area of the mine north of South Tunnel Road, within which all excavations for coal working, overburden storage, coal washing and stocking and the main operational activities of the mine would take place. 222.80 ha (46.61%)

Peripheral Areas of Surface Mine

North of South Tunnel Road and to the west, north and east of operational area. Primarily for early remediation of shafts, adits and other old mining disturbance; environmental controls such as water treatment areas, soil/baffle mounds, acoustic/visual screening and the diversion of services. Early release of areas to common grazing and public access within 2 years of commencement of coaling. 178.14 ha (37.26%)

Additional Southern Remediation Land

Land south of South Tunnel Road, included for land remediation works associated with surface drainage of colliery spoil tips north of Fochriw. Early release of areas for common grazing and public access within 2 years of commencement of coaling. 55.03 ha (11.51%)

Land for Road Improvements

Land required for road improvement works north and east of Cwmbargoed Disposal Point, including works to the northern access points to the disposal point and the southern approach to the junction of Bogey Road and Fochriw Road. 1.69 ha (0.35%)

Cwmbargoed Disposal Point

That part of the disposal point and all its infrastructure and facilities within the County Borough of Caerphilly, within which a new coal washing plant is proposed, and including additional land for the development of a new water recycling facility, together with proposals for a new layout for the water treatment facilities for the period between 31st December 2024 to the cessation of mining operations at the Nant Llesg Surface Mine. 20.40 ha (4.27%)

- 3.6 The application site area can also be divided temporally as follows:

Land for early release within 2 years of commencement of coaling: 153.56 ha (32.12%)

Land required for duration of surface mining operations: 324.50 ha (67.88%)

Total Planning Application Site Area: 478.06 ha (100.00%)

- 3.7 The 153.56 ha of land for early release within 2 years of the commencement of coaling operations would consist of the areas for early land remediation shaded purple on Planning

Application Drawing MA/NL/PA/003 and the Caerphilly County Borough Council land included for land remediation works shaded light blue and yellow on the drawing. These areas amount to 32.12% of the total application site area, with the remainder of 67.88% or 324.50 ha being required for the duration of the proposed surface mining operations.

Operational Area of Surface Mine

- 3.8 This is land that would form the main operational area of the Nant Llesg Surface Mine, which would also incorporate land remediation works to address public safety issues and drainage concerns associated with old mine workings. All operations on this land would be at least 500m from the settlement boundary as defined in the Caerphilly County Borough Council LDP.
- 3.9 The operational area of the surface mine would lie within the area north of South Tunnel Road. In line with paragraph 51 of MTAN2, a proposed 'Operational Boundary' is identified clearly on Planning Application Drawing MA/NL/PA/003 as a blue line. It lies to the west and north of the green dashed line marking the 500m offset from the settlement boundary and represents the operational area of the mine within which the longer-term activities associated with the mine will be concentrated. Only early remediation works that are to be carried out within the first 12 to 24 months of coal working and facilities aimed at protecting the community and its immediate environment would take place outside it. These are all considered to generate only insignificant impacts of relatively short duration. The area within the proposed Operational Boundary would be 222.8 ha.
- 3.10 The 'Coal Working Excavation Area' is shown as an orange dashed line on Planning Application Drawing MA/NL/PA/003. All excavations for coal working would take place within this area, which would span a period of approximately 10 years. Apart from material to form the 'Visual and Acoustic Bund', all overburden from the excavations would be stored on the 'Overburden Storage Area' indicatively shown on the drawing. All such operations would be at least 500m from the local community settlement boundaries.
- 3.11 Topsoils, subsoils and peat from areas to be disturbed would be stripped and stored separately in the 'Soil Storage Areas' and 'Peat Storage Areas' shown on Planning Application Drawing MA/NL/PA/003.
- 3.12 The offices, car park and staff welfare facilities would be located in the south-western part of the operational area, while the workshops and on-site coal processing facilities would be located at the south western corner of the coal working excavation area as shown on Planning Application Drawing MA/NL/PA/003. All these lie within the proposed 'Operational Boundary'.
- 3.13 In addition to mining activities, shafts and adits within the operational area would be located and remediated as necessary. Those within the coal working excavation area would be removed as a matter of course during mining excavations.

Merthyr Industrial Services Landfill Site

- 3.14 The disused railway cutting north of South Tunnel Road is currently occupied by Merthyr Industrial Services Ltd as a licenced inert waste landfill site. The site measures approximately 5.35 ha in extent and can be seen on Planning Application Drawing MA/NL/PA/003 as extending northwards into the operational area of the surface mine. It lies within the proposed overburden storage area with the northern end extending slightly into the proposed coal working excavation area. The landfill site has been incorporated into the scheme so that the

waste material can be investigated, treated and/or disposed of as required to enable the waste licence to be surrendered and the land temporarily occupied for overburden storage. The inclusion of this land has enabled the originally planned two overburden storage mounds to be replaced by a single mound, having a lower profile and a footprint that avoids Rhaslas Pond.

- 3.15 An inspection of the landfill site established that non-inert material had been deposited including soil fines, plastic, paper, small electrical components, metal and wood. Evidence of burning of waste was also noted. Similarly, chemical testing has established the presence of non-inert materials within the landfill.
- 3.16 In liaison with Natural Resources Wales (NRW), hazardous waste encountered and materials with gassing potential would be removed from the area and disposed of responsibly.
- 3.17 Material deemed suitable for re-use on site would be used to backfill the MIS landfill void, which would subsequently be contained by an engineered capping layer prior to constructing the overburden mound over the landfill site.
- 3.18 The prior investigation, treatment or removal of wastes prior to capping and overtipping with overburden would effect the remediation of this landfill site and prepare it for subsequent restoration to its proposed afteruse as urban common land. The remediation and eventual afteruse of this land would be of significant benefit to the local community.

Peripheral Areas of Surface Mine

- 3.19 The peripheral areas can be seen on Planning Application Drawing MA/NL/PA/003, being the land that lies outside the blue 'operational boundary' of the surface mine and north of South Tunnel Road.
- 3.20 The areas have been primarily included to carry out land remediation works to improve the land and address existing risks to public safety. Such works include the location and stabilisation of the extensive old mine shafts and adits known to exist over the areas and to generally tidy up and remove any unwanted mining dereliction or other damage to the surface of the land. Being outside the 'Operational Boundary' of the mine, they represent short term development providing long-term amenity and permanent health and safety benefits, particularly on areas that are within the Urban Common. Chapter 17: 'Planning Policy' of the Planning Statement fully considers the proposed works in terms of the advice in MTAN2, concluding that they are fully consistent with the principles set for working within relevant distances of a settlement.
- 3.21 In addition to such land remediation works, the peripheral areas would be partly used in association with the surface mine to accommodate temporary environmental facilities such as soil storage bunds, water treatment facilities and the visual and acoustic screening bund. These are environmental provisions aimed at protecting the community and/or its immediate environment and their construction and eventual removal at the end of surface mining operations would involve short term works of insignificant impact. As such, they are also considered consistent with the advice given in MTAN2.
- 3.22 Water treatment areas would be constructed within the peripheral areas during the first twelve months; each area taking approximately two to three months to complete. The soil storage areas would be constructed within the first six months of site operations and the visual and acoustic screening bund would be completed within the first four months of overburden excavation works. Their removal on completion of surface coal mining operations would take place in similarly phased operations over similar durations.

- 3.23 To the east of the operational boundary, part of these works would be within 500m of the settlement boundary, although, in this location the settlement boundary follows the western edge of the Heads of the Valleys Industrial Estate and the Capital Valley Eco Park. However, apart from a small area of Water Treatment Area WTA1, all such environmental facilities would be more than 500m from the residential settlements that lie beyond the industrial estates.
- 3.24 Surface land remediation works would also be carried out within the peripheral areas to stabilise old mining shafts and adits and to generally tidy up the area and remove areas of unwanted mining dereliction and surface damage. Following the remediation of these areas, large tracts of the peripheral areas shaded purple and yellow on Planning Application Drawing MA/NL/PA/003 would be released from the site within 12 to 24 months of the commencement of coaling operations and common grazing and public access uses reintroduced, providing improved off-road access to the east and west of the operational area for the public/community. Permissive access would be established at the time to avoid any smaller areas of on-going land remediation associated with the stabilisation of shafts and adits or minor surface despoilment, and any on-going aftercare associated with areas of planting, nature conservation or cultural heritage interest.

Additional Southern Remediation Land

- 3.25 Outside the surface mine and to the south of South Tunnel Road, an additional area of land has been included in the planning application site area for the sole purposes of land remediation to address public safety and historical land drainage concerns.
- 3.26 The area is the site of former coal tips and tip washing scheme and has suffered from severe scouring by surface water run-off, which is in turn contributing to the problem of silt building up in the lake at the nearby Darran Valley Country Park. The area north of Fochriw has therefore been included in order to help remediate this problem. It is shown shaded light blue and yellow on Planning Application Drawing MA/NL/PA/003 to the south of South Tunnel Road.
- 3.27 Some of the works, being those within the more southerly area shaded yellow on Planning Application Drawing MA/NL/PA/003, would be within 500m of the Fochriw settlement boundary, but the works would be of short duration (approximately 12 weeks) and have a low impact.

Land for Road Improvements

- 3.28 An area of land has been included within the planning application site area for road improvement works at the junction between Fochriw Road and the Bogey Road with other minor works being carried out at the entrances to the Cwmbargoed Disposal Point. These works will improve the safety of this junction where historically accidents have occurred. The location of these works is indicated in dark blue on Planning Application Drawing MA/NL/PA/003.
- 3.29 All coal from the Nant Llesg Surface Mine would be transported to Cwmbargoed Disposal Point for preparation and processing before being dispatched to market. It would be transported by road, entering Fochriw Road at Access Point 'A' on Planning Application Drawing MA/NL/PA/003 and continuing to the junction with Bogey Road, where it would turn right before turning left off the Bogey Road into the disposal point at Access Point 'B'. Returning vehicles would leave the disposal point at Access Point 'C' turning right onto the Bogey Road and returning to the surface mine along the reverse route. The existing road layout between the surface mine and the disposal point has sufficient capacity to accommodate this traffic.

However, improvements to the road junction between Fochriw Road and the Bogey Road are proposed by Miller Argent to improve traffic visibility along Fochriw Road to the south. The area of the proposed works has therefore been included within the planning application site area, as illustrated on Planning Application Drawings MA/NL/PA/001 and MA/NL/PA/003.

- 3.30 Minor works are also proposed at the two most easterly access points to Cwmbargoed Disposal Point along the Bogey Road; Access Points 'B' and 'C' on Planning Application Drawing MA/NL/PA/003. Adjustments would be made to the aprons and kerbing at these points to deter traffic from turning left when leaving the disposal point. This would be supplemented by appropriate signage instructing all coal lorries to turn right on leaving the disposal point, and is further reinforced by existing 'weight restrictions' on the Bogey Road to the west of the access point
- 3.31 All improvement works would be of short duration and more than 500m from the settlement boundary. Detail of the proposed works is shown on Planning Application Drawings MA/NL/PA/024 to MA/NL/PA/027.
- 3.32 The environmental assessment of the likely environmental effects of this traffic can be found in the 'Traffic and Transport' Chapter of this Environmental Statement.

Cwmbargoed Disposal Point

- 3.33 That part of the existing Cwmbargoed Disposal Point that lies within the County Borough of Caerphilly and includes all coal handling, processing and dispatch facilities, has been included within the application site boundary, as shown on Planning Application Drawing MA/NL/PA/003. Changes to the operational layout of the northern part of the disposal point are necessary to accommodate the installation of an additional coal washing plant and its associated feed and product stocking areas.
- 3.34 To meet the specification being demanded by the market, a high specification and high capacity coal washing plant is required at Cwmbargoed Disposal Point. This is true for coals currently being produced by the Ffos-y-fran Land Reclamation Scheme and for those that would be produced by the Nant Llesg Surface Mine. The new coal washing plant would have the capacity to process up to 400 tonnes per hour and be capable of processing coal from both the Ffos-y-fran and the Nant Llesg surface mines to the higher specification and at sufficient quantities required to serve the market, whilst at the same time remaining within the currently permitted hours of working for the disposal point.
- 3.35 Miller Argent has submitted a separate planning application to Caerphilly County Borough Council for the same coal washing plant to be erected and used at the same location to process Ffos-y-fran coals. Miller Argent does not intend withdrawing that application as the plant is required whether or not the Nant Llesg Surface Mine proceeds. However, the same proposal is incorporated within this application to ensure its consideration in relation to processing additional coal from the Nant Llesg Surface Mine.
- 3.36 If the separate stand-alone planning application for the coal washing plant is determined favourably before the Nant Llesg application, then permission for the built development elements of the washing plant as part of the Nant Llesg proposals would not be required. Notwithstanding this, if permission is granted for the Nant Llesg Surface Mine, then there would be an increase in the throughput of coal within the currently permitted period of operations at the disposal point.

- 3.37 In order to handle the additional tonnages now proposed from Nant Llesg, additional water storage capacity needs to be provided at the disposal point. This would ensure that sufficient water would be available for the plant to operate throughout the drier summer periods. A new 'water recycling facility' is therefore proposed to the south-west of the railway line as shown on Planning Application Drawings MA/NL/PA/003 and MA/NL/PA/023. Further detail of these proposals is provided later in this chapter.
- 3.38 Following the cessation of coaling operations at the FLRS, and in any event before the 31st December 2024, it is proposed that a new layout for the water treatment facilities at the CDP be provided within the planning application site boundary to replace the existing layout that would be partly removed during the restoration of those areas of the CDP that lie outside the planning application site area, as required by the extant planning permission for those areas of the CDP.
- 3.39 All proposed development within Cwmbargoed Disposal Point would be more than 500m from the settlement boundary.

Site Ownership

- 3.40 Miller Argent controls most of the land within the planning application site boundary, the greater part, generally the land which is urban common, being held under a 999 year lease from Dowlais Top Investment Co. Ltd. Miller Argent also holds the freehold over Cwmbargoed Disposal Point together with areas to the north and east of the common. The remainder is owned by third parties as listed in Appendix MA/NL/PA/A002 to the Planning Statement.
- 3.41 The area to the south of South Tunnel Road, which has been included for remediation works only, is owned mostly by Caerphilly County Borough Council with a smaller part being in the ownership of Dowlais Top Investment Co. Ltd.
- 3.42 The proposed remediation of land not owned or leased by Miller Argent would be carried out under licence or legal agreement.
- 3.43 Miller Argent has control of all adjoining land edged and shaded blue on the Planning Application Site Area Drawing MA/NL/PA/001. The full extent of Miller Argent's land ownership outside the application site is also shaded blue on the Location Plan MA/NL/PA/002.

Mineral Interests

- 3.44 Miller Argent has researched the mineral interests in the land to the best of its ability and as far as they are aware, the mineral interests affected by the proposal are mostly vested with the respective surface owners. However, the applicant is also aware of certain third party minerals interest and the possibility of other unknown mineral owners coming forward.
- 3.45 Miller Argent has therefore given notice to the known mineral owners listed in Appendix MA/NL/PA/A002 of the Planning Statement and certified accordingly.

Urban Common Land

- 3.46 A large proportion of the land to which this application relates is Registered Urban Common Land forming part of the Gelligaer & Merthyr Common (CL38). The works would have the

- effect of preventing or impeding access to or over the common and also include works for the resurfacing of land.
- 3.47 As such, an application for consent to carry out the proposed works is being made to the Welsh Ministers under Section 38 of the Commons Act 2006. In order to mitigate the prevention or impedance of access to the common for the duration of site operations, the proposal would provide substantial areas of land off-site for temporary grazing and/or permissive public access for the duration of site operations. It would also provide for certain areas to be submitted for consideration as permanent common land on completion of the works. Further detail of the proposal is set out at later in this chapter.
- 3.48 Not all the land within the planning application site area would need to be closed to public access and common grazing for the entire duration of surface mining operations. The operational area of the mine, together with the visual and acoustic screening bund and water treatment areas, would be fenced against the common where appropriate for the duration of mining operations, but the peripheral and southern land remediation areas, where they lie over the common, would not need to be entirely fenced out for the entire period. All areas would be surveyed during the early stages of site operations to locate and identify shafts, adits and other minor mining dereliction in need of remediation.
- 3.49 Such areas would be immediately fenced out of the common if unsafe or fenced out as required when the remediation works are carried out. Consequently, most of the common land within the peripheral and southern remediation areas would remain open for public access and common grazing. Permissive bridleways and footpaths would also be made available along routes that avoid the remediation areas to enhance and replace the existing public access links between the land to the north and south of the proposed mine.
- 3.50 All land remediation works in the peripheral and southern areas would be completed within 12 to 24 months of the commencement of coaling operations at the mine. The individual remediation areas that lie on the common would be made progressively available for public access and common grazing as each becomes sufficiently restored and rehabilitated to permit public access and grazing. Such matters would be agreed with the local planning authority.
- 3.51 The enhanced public access provisions and the early remediation and restoration of the peripheral and southern areas of land, making them safer and more enjoyable for public use, would provide early community benefits to be enjoyed for the greater part of the proposed mining operations.
- 3.52 The effects on the common, and the proposed mitigation measures have been assessed in this Environmental Statement within the Chapters on Ecology and Nature Conservation; Agricultural Land Use and Soils; Recreation and Tourism; Cultural Heritage; and Landscape and Visual Impact. Reference to the effect of the commons application is also made in the accompanying Health Impact Assessment.
- 3.53 In addition to the application being made under the Commons Act 2006, the applicant intends to enter into an appropriate agreement with the commoners for the suspension of their rights of common for the duration of the proposed operations. This would be negotiated through the Commoners Association and those commoners most affected by the proposed scheme. Rights of common suspended over the application site would remain suspended for the duration of the proposed operations.

- 3.54 Such provisions and agreements for the suspension of rights over the common would be in addition to those currently in place in respect of the nearby Ffos-y-fran Land Reclamation Scheme.

Public Rights of Way

- 3.55 A network of public rights of way cross the site as shown on Planning Application Drawing MA/NL/PA/037. To enable the development to proceed, an application is to be made under Section 257 of the Town and Country Planning Act 1990 for an Order to stop-up those routes that lie within the planning application site boundary, and for a bridleway to be created along the north western application site boundary as an alternative highway for use as a replacement for those authorised by the Order to be stopped up.
- 3.56 The proposed bridleway is shown on Planning Application Drawing MA/NL/PA/038 and would, together with the existing bridleway that follows and lies just outside the northern boundary of the scheme, provide a route to the north of the surface mine that could be followed on foot or on horseback between the public highways and rights of way to the east and the public highway, rights of way and urban common to the west. This route would be made available before the commencement of mining operations.
- 3.57 Routes over the areas included in the development proposals for short-term land remediation works would be made available for public access once remediation works are completed. Those routes over the remainder of the application site would not become available until after the land has been suitably restored following surface mining operations and the required period of aftercare has been completed. Mining operations and restoration are anticipated to take approximately 14 years, which would be followed by a minimum 5-year period of aftercare.
- 3.58 The proposals for the public rights of way that lie within the planning application site boundary, together with those proposed for reinstatement as part of the restoration strategy, are set out in greater detail later in this chapter and at Chapter 12 of the Planning Statement.

Trees

- 3.59 A Tree Survey of the development site was requested by Caerphilly County Borough Council. A survey and assessment of the trees and woodlands within and adjoining the application site was therefore undertaken between October and December 2012. The resultant 'Tree and Woodland Impact Assessment' is included as a stand-alone report at Appendix MA/NL/PA/A012 of the Planning Statement.

Site Geology

Superficial Deposits

- 3.60 The British Geological Survey Sheets SO00NE and SO10NW show the majority of the site as having either been 'worked out' by opencast coal seam operations, or to be covered by 'made ground (mainly from coal and ironstone workings). Where undisturbed, a drilling program carried out by Miller Argent has shown the superficial deposits, which are generally less than 10m thick, to comprise Boulder Clay typically overlain by thin clay and peat deposits, the

exception is along the lower reaches of the Nant Llesg where gravel and Boulder Clay deposits occur above rockhead.

Solid Strata

- 3.61 A generalised vertical section illustrating the strata to be encountered within the site area is shown on Planning Application Drawing MA/NL/PA/041 which also indicates which part of the succession crops out within the excavation area, and which parts crop out within the overburden storage area. Within the excavation area the strata that will be encountered belong to the Lower and Middle Coal Measures of the Westphalian Stage of the Carboniferous Period and consist chiefly of mudstones and silty mudstones with subordinate sandstones, coals, seatearths and ironstones. The strata outcropping over the Overburden Storage Area belong to the upper part of the Middle Coal Measures and to the lower part of the Upper Coal Measures, and while comprising similar lithologies to those that will be encountered in the excavation, there is an increased proportion of sandstone within this sequence. Planning Application Drawing MA/NL/PA/041 also shows the typical average proportions of mudstone to sandstone to ironstone within the overburden as intersected during the drilling program.

Coal Seams

- 3.62 The coal seams to be encountered within the excavation area and their position within the sequence of strata are also shown on Planning Application Drawing MA/NL/PA/041, which shows the average, and range of, seam thicknesses measured during the exploration and the seam intervals. Some of these coal seams contain partings which are too thin to illustrate at this scale, and the partings between the seams themselves can vary considerably within the ranges shown. The lowest seam to be worked is the Little Vein and the highest the Black Pins (the Lower Pentre of the British Geological Survey). The coal is all of bituminous quality. The strata beneath the Overburden Storage Area continue the sequence upwards from the Black Pins to the ground between the Gilfach and No 2 Rhondda seams, a thickness of over 120m. The coal seams within this upper sequence of strata are generally thin, the thickest, according to the British Geological Survey, being the Gilfach at 1 metre.

Structure

- 3.63 Planning Application Drawing MA/NL/PA/042 provides a simplified geological map of the area. The coal seams outcrop across the site in a general east-northeast to west-southwest direction and are intersected by minor faults, with throws of up to 4 metres, trending north-northwest to south-southeast. These minor faults are recorded on the old workings records plans as being associated with 'disturbed' and, occasionally, with 'barren' ground. The largest of these, which would not be intersected in the proposed excavation, occurs just within the eastern site boundary and downthrows to the west. This fault does not affect the ground beneath the overburden mound. Plans of the old workings in the Lower Four Feet also show the presence of 'rolls' that vary in axial trend from north-northwest to northeast that are interpreted from elsewhere in the coalfield as localised monoclinial folding related to low angle reversed faulting originating in the seam pavement and steepening through the seam. The strata dip in a general south-south-easterly direction between 3 and 9 degrees. Planning Application Drawing MA/NL/PA/042 shows the positions of Section 1, a north to south section, and Section 2, a west to east section through the proposed excavation, these sections are shown on Planning Application Drawing MA/NL/PA/043.

Previous Underground and Surface Mining

- 3.64 The site area has been subjected to extensive underground mining for both coal and ironstone, probably dating back to before the 18th century but mainly during the 19th century with the latest workings taking place in the 1930s. The age of the majority of these workings indicates that they were associated with the establishment and expansion of large scale iron and steel manufacturing in Dowlais and Rhymney. The iron ore, which is present as nodules in bands throughout the sequence, particularly between the Garw Seam and the Lower Four Feet Seam but also between the Rhaslas and the Big and between the Two Feet Nine and the Two Feet Nine Rider B, was worked initially by shallow surface mining methods called 'patchworking'. This method was also used to extract coal for the smelting process, but when the economic limit of patchworking was reached, the ore and the coal were reached by shafts and adits, and a large number of these are known to exist within, and adjacent to, the site area.
- 3.65 Most of the seams on site have been subjected to underground mining to varying degrees, but particularly extensive workings exist in the Lower Four Feet, Little Vein, Rhaslas, Big, Black, Upper Four Feet and Two Feet Nine Seams. The mining methods employed appear from the old workings records plans to have been predominantly 'pillar' and 'room' or 'stall', and while there are written records of early mechanised working in the latest Little Vein workings, it has not been possible to establish whether this took place within the site area. Stalls, or rooms, on the old workings records plans are shown to have been up to 20 feet wide and 400 feet long, with pillars as little as 8 feet wide. 'Robbing' where pillars have subsequently been extracted has also taken place, according to records of workings surveyed on the British Coal Opencast Executive's Site Completion plans. Old workings may also occur sporadically throughout the sequence at the ironstone horizons. More recently, in the second half of the last century, larger scale mechanised surface mining has taken place, the extent and names of these operating sites is shown on Planning Application Drawing MA/NL/PA/042.

The Proposal

Introduction

- 3.66 The proposed scheme is called the 'Nant Llesg Surface Mine, Incorporating Land Remediation' and covers approximately 478.1 ha of land in the County Borough of Caerphilly. It is proposed to mine approximately 6 million tonnes of coal using surface mining methods and to carry out land remediation works within and adjacent to the surface mine to address public safety, mine-water and land drainage concerns. The scheme also incorporates ancillary operations and works as set out below, including the progressive restoration of the land followed by a minimum five-year period of aftercare.
- 3.67 The full detail of the proposal is provided in the Planning Statement, which should be read in conjunction with this Environmental Statement, the Health Impact Assessment, the Sustainability and Carbon Statement, the Public Consultation Statement and associated supporting documentation and drawings. The compendium of application documents consists of the following:
- Planning Statement;
 - Planning Application Drawings;

- Planning Application Appendices;
- Environmental Statement;
- Environmental Statement Drawings;
- Environmental Statement Appendices;
- Non-technical Summary of Environmental Statement;
- Health Impact Assessment;
- Sustainability and Carbon Statement;
- Design & Access Statement;
- Public Consultation Statement.

Development Proposals

3.68 The Nant Llesg Surface Mine, Incorporating Land Remediation incorporates the following development proposals, which are outlined here and set out in greater detail below:

- **Mineral Workings at the Nant Llesg Surface Mine** to recover approximately 6 million tonnes of coal by surface mining methods; to construct, erect or install all related soil storage and overburden mounds, buildings, plant, structures and other facilities ancillary thereto;
- **Remediation of Old Shafts, Adits and Mining Dereliction** associated with former iron ore and coal mining, including improvements to the quality of mine water discharge into the River Rhymney;
- **Land Remediation to Address Silting of Darran Valley Country Park Lake**, involving drainage works on the site of a former colliery tip and tip washing scheme to help address the scouring of tip material into the adjoining watercourse and reduce the build-up of silt at the lake at Darran Valley Country Park;
- **Road Improvement Works** at the junction of Fochriw Road and Bogey Road to improve visibility for traffic using the junction by reducing the vertical alignment of Fochriw Road to the south of the junction; along with the formation of Access Point 'A' to the surface mine and improvements to vehicular access points 'B' and 'C' to Cwmbargoed Disposal Point;
- **Works Associated with Rhaslas Pond** – The archaeological examination and recording of the northern embankment before its removal and the protection of and minor drainage works to the southern embankment; it being considered a prospective Scheduled Monument;
- **Investigate, Treat, Remove and/or Cap Waste Materials** at the licenced Merthyr Industrial Services Limited inert landfill site that currently lies within the area of the proposed scheme;

- **The Provision of an Additional Coal Washing Plant and Ancillary Water Recycling Facility** at Cwmbargoed Disposal Point for the preparation and processing of coal for the duration of mining operations at the Nant Llesg and Ffos-y-fran surface mines;
- **Continued Use of facilities at Cwmbargoed Disposal Point** for the duration of mining operations at the Nant Llesg and Ffos-y-fran surface mines, including the provision of a new layout for the water treatment facilities for the period 31st December 2024 until the cessation of mining operations at the Nant Llesg Surface Mine;
- **Restoration and Aftercare of the Land**, being restoration of the land in accordance with an approved Restoration Strategy and aftercare of the land for a minimum period of five years.

3.69 To facilitate these development proposals it is also necessary that separate applications are submitted and planning obligations undertaken to address the following:

- **Public Rights of Way**

An application under Section 257 of the Town and Country Planning Act 1990 to stop up all public rights of way that cross the site, together with an appropriate planning obligation under Section 106 of the Act to enter into a Public Path Creation Agreement under Section 25 of the Highways Act 1980 for the creation of a replacement network of rights of way as part of an approved restoration strategy for the land.

- **Common Land**

An application under Section 38 of the Commons Act 2006 for the consent of the Welsh Ministers for the proposed works over the areas of the land that form part of the Gelligaer and Merthyr Urban Common (CL38), together with an appropriate planning obligation under Section 106 of the Town and Country Planning Act 1990 for the provision of temporary grazing and public access land for the duration of mining operations including restoration and aftercare of the land.

Nant Llesg Surface Mine

- 3.70 It is proposed to work the Nant Llesg Surface Mine by surface mining methods.
- 3.71 The underlying coal reserve would be comprehensively worked by a programme of surface mining operations followed by the progressive restoration and aftercare of the land.
- 3.72 In working the coal reserve, excavations would encounter and remove the concentration of derelict shafts and adits that occur across the coal working excavation area; recognised by MTAN2 as an 'effective solution to prevent risks to health and safety arising from previous mineral working'. Within the site area, there are 138 known shafts and adits previously associated with iron ore and coal workings in this area. These are shown on Planning Application Drawing MA/NL/PA/003.

- 3.73 The phasing of the working site is shown on Disposition Drawings 1 to 5 (MA/NL/PA/004 to MA/NL/PA/008). These show the progressive nature of the coaling operations and restoration of the site; the site being worked in a west to east direction.
- 3.74 All coal working activities within the excavation area of the surface mine would be carried out at least 500m from the settlement boundary. Although not reflected in the Caerphilly Local Development Plan, paragraph 29 of MTAN2 states that 'coal working will generally not be acceptable within 500 metres (m) of settlements'.
- 3.75 At paragraph 49, MTAN2 also makes provision for exceptional circumstances within 500m of settlements: "where coal working provides the most effective solution to prevent risks to health and safety arising from previous mineral working"; "to remediate land damaged by shallow coal workings or mine waste where coal extraction appears to be the most sustainable option"; or "when the proposal is of overriding significance for regeneration, employment and economy in the local area".
- 3.76 The proposal accords with these aspirations of MTAN2.
- 3.77 Details of plant to be used for the excavation and transportation of overburden and coal, together with the proposed haul routes, are shown on the Disposition Drawings MA/NL/PA/004 to MA/NL/PA/008.
- 3.78 Table 3.1 on the following page details the primary site statistics and parameters for the Nant Llesg Surface Mine:

Table 3.1 – Primary Site Statistics and Parameters

Nant Llesg Surface Mine, Incorporating Land Remediation	
Planning Application Site Area	478.1 ha
Operational Area	222.8 ha
Areas Peripheral to Operational Area	178.1 ha
Cwmbargoed Disposal Point Area	20.4 ha
Land Remediation Area South of Mine	55 ha
Coal Working Excavation Area	96 ha
Maximum Depth of Excavation	165 m
Maximum Void (<i>Largest Open Excavation</i>)	32.5 million m ³
Total Overburden Excavated	70.0 million m ³
Area for Overburden Storage	86.1 ha
Area for Acoustic & Visual Screening Bund	21.1 ha
Maximum Height of Overburden Mound	50 m
Area for Storing Soils and Peat	6.8 ha
Recoverable Coal	6 million tonnes
Period of Preliminary Operations	0.50 years
Period of Earthworks Prior to Coaling	0.50 years
Period of Coaling (<i>Excavation of Coal</i>)	10.00 years
Period for Return of Overburden	3.00 years
Total Period of Operations	14.00 years
Period of Aftercare	At least 5 years
Anticipated Coal Production	Up to 750,000 tonnes per annum
Equivalent Weekly Tonnage	15,625 tonnes per week

Surface Mine - Site Evaluation and Design

3.79 During 2011 and early 2012 an extensive ground investigation was carried out by Miller Argent over a six-month period. A total of 199 boreholes were drilled, 71 of which were cored and 724

coal samples were taken. In total 25,650 metres of drilling was completed during this period. Examination of the borehole information has indicated a recoverable reserve of 6 million tonnes of Welsh Dry Steam Coal.

3.80 The recoverable reserve is limited by the following constraints:

- Previous surface coal workings to the north;
- Existing utility services to the west;
- The Fochriw Road to the west;
- A 500m standoff from the Rhymney Settlement Boundary to the east;
- The limitations of suitable overburden and soil storage space which limits the depth and southern limit of the works.

3.81 The site would be worked down to the Little Vein coal seam horizon at a depth ranging from 26m to a maximum of approximately 165 metres. The seams to be worked within the main excavation area are those from the Eighteen Inch (Black Pins) down to the Little Vein. The seams to be worked are illustrated on plan MA/NL/PA/041, and are discussed briefly in Chapter 3: Site Geology.

3.82 The site would be worked from the west to east; this would allow better screening of the excavation works from the village of Rhymney. To assist this, a visual and acoustic screening bund would be constructed as part of the initial excavation works. The location of this screening bund is shown on Planning Application Drawing MA/NL/PA/003. The screening bund would be constructed during the first four or so months after the start of overburden excavation and would remain until the final stages of backfilling operations.

Programme & Stages of Mining Operations

3.83 The site operations can be broken down into the following stages:-

- | | |
|---------|---|
| Stage 1 | Development of Box Cut
(Initial void prior to any in-pit backfilling) |
| Stage 2 | Development of Maximum Void
(The largest open excavation) |
| Stage 3 | Maximum Void to Start of Backfilling of Overburden
from the Overburden Mound |
| Stage 4 | Up to End of Coaling |
| Stage 5 | Backfilling and restoration works to achieve the finished
landform after coaling |

- 3.84 The following Table 3.2 sets out the approximate times required to complete the stages referred to above for a maximum annual rate of coal production of 750,000 tonnes. This includes the necessary ramping up and down of coal production at the start and the end of the coaling period. The table also refers to the appropriate dispositions, which illustrate the progress achieved at each stage. The dispositions are illustrated on Planning Application Drawings MA/NL/PA/004 to MA/NL/PA/008.

Table 3.2 - Timescales Required to Complete Stages of Operations

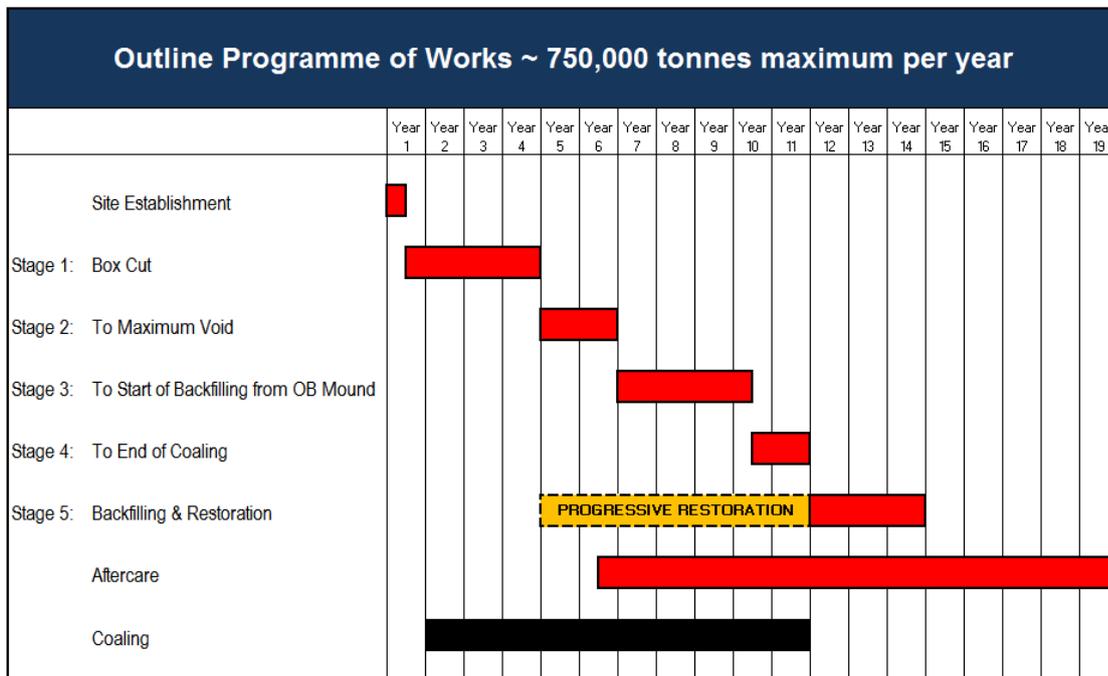
Disposition	Stage	750,000 Tonnes/Annum
Disposition 1	Box Cut (Inc. Site Establishment)	Year 1.00 – 4.00
Disposition 2	Up to Maximum Void	Year 4.00 – 6.00
Disposition 3	Max. Void to Start of O/B Backfilling from O/B Mound	Year 6.00 – 9.50
Disposition 4	Up to End of Coaling	Year 9.50 – 11.00
Disposition 5	Backfilling and Restoration	Year 11.00 – 14.00

Note: Disposition 0 is referred to in some Chapters of this Environmental Statement. This relates to the proposed drainage works that would be carried out as early land remediation works on the old colliery tips north of Fochriw. Such works lie outside the proposed surface mining activities and are therefore not included in the table above, but would be completed within the first two years of coaling operations at the mine. Disposition 0 is shown on Planning Application Drawing MA/NL/PA/004.

- 3.85 In opening the initial void (the box cut), overburden from the excavations would be placed into the visual and acoustic screening bund and thereafter into the overburden mound. The box cut provides the necessary working space to progress excavations to their full depth.
- 3.86 On completion of the box-cut, excavations would continue to progress in a general easterly direction with some of the excavated material continuing to be put into the overburden mound and some being used to backfill the western side of the advancing void. This process would continue until the void is at its maximum size.
- 3.87 Thereafter, excavations and backfilling operations would take place within the confines of the void with all excavated material going to backfill the western side of the advancing void. This would continue until such time as all available coal had been removed.
- 3.88 At the end of the coaling period, the material stored in the overburden mound would be returned to backfill the final void, followed by the material from the visual and acoustic screening bund.

- 3.89 Overburden replacement and the spreading of soils and/or soil-forming materials to achieve the final restoration contours would take place as each stage of the progressive backfilling operations is completed. The advancing backfilled area would be progressively restored to provide the landform, micro-topography and landscape features of the approved restoration design. This progressive restoration would advance in stages across the site as each bench is finally backfilled to restoration levels.
- 3.90 The final restoration design for each stage of the progressive restoration would be submitted for the consideration and written approval of the local planning authority at least six months before the restoration of each stage is complete.
- 3.91 Although the specific area of each stage of progressive restoration is a matter to be determined at the time, the approximate areas can be envisaged from the expanding area of backfilled land to the west of the working void on Disposition Drawings 2 to 5 (MA/NL/PA/005 to MA/NL/PA/008). It is proposed that a scheme be submitted for each of those dispositions together with a final scheme at least six months prior to the completion of backfilling of the final void.
- 3.92 The replacement of overburden material and spreading of soils and soil-forming materials should be completed on all areas within 3 years of the completion of coaling.
- 3.93 Aftercare of each stage of the progressively restored land would continue for a minimum of 5 years after the completion of final restoration on that stage.
- 3.94 The programme of works illustrated on the following bar chart (Figure 4.2) details the relationships and durations of the above mentioned site activities based on a maximum rate of coal production of 750,000 tonnes per annum that includes for the necessary ramping up and down of coal production at the start and the end of the coaling period.

Figure 4.2- Programme of Works



Site Establishment/Preliminary Works

Site Clearance

- 3.95 In addition to clearing stock and any removable apparatus or chattels from areas of land that are to be disturbed, the land would be first cleared of protected species and birds would be deterred from nesting. Any features of archaeological interest would be recorded and/or removed or preserved. Further details of such clearance works are given below.

Protected Species

- 3.96 Species listed in Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended) or in Annex 5 of the Wildlife and Countryside Act 1981 (as amended) would be captured and removed to suitable receptor sites. Where appropriate, works would be carried out in accordance with a licence to disturb such species granted by Natural Resources Wales.

Nesting Birds

- 3.97 In order to avoid destruction of birds' nests, which are protected by law, it is normal industry practice to clear vegetation which may hold birds' nests outside the period March to August inclusive. In the case of the proposed operations, many of the bird species present are ground-nesting, and clearance of vegetation would largely be through stripping of soils. Given the nature of the soils at the site and the climatic conditions, it would generally not be practicable to begin soil stripping before March. In order to avoid destruction of nests, birds would be actively deterred from nesting in areas where soils are to be stripped, or which are otherwise to be affected by operations by appropriate measures during March and April.

Survey, Record and/or Preserve Features of Archaeological Interest

- 3.98 A full archaeological assessment of the application site has been carried out and is reported at Chapter 15 below and its appendices.
- 3.99 Further archaeological investigation and recording of principal archaeological assets would be carried out before being disturbed by engineering ground works. During the early stages of the site operations when phased soil stripping is taking place, there would be an archaeological watching brief. Any areas of archaeological interest that can't be protected in-situ and are to be removed as part of the normal working of the site would be properly and professionally recorded prior to removal. Fencing would be used to protect any features that are to remain undisturbed within the site.
- 3.100 Further study and recording of the Dowlais Free Drainage System would be carried out as features are encountered, both during the early stages of site operations and during mining excavations.
- 3.101 The southern embankment of Rhaslas Pond has been identified as being worthy of protecting as a Scheduled Monument and Cadw are presently engaged in the scheduling procedure.

Access will be restricted in order to protect the monument during surface mining operations and incorporated into the restoration strategy at the end of mining operations.

- 3.102 The northern embankment of the Rhaslas Pond, although not considered worthy of scheduling, is acknowledged to be of archaeological interest and would be professionally recorded prior to removal. Materials from the embankment would be stored in a suitable location for the duration of surface mining operations to be used to represent the original location of the northern embankment during the restoration of the site.
- 3.103 Wherever practicable, features would be retained in-situ during site operations. Some items would be able to be recovered during site operations and would be incorporated into the detailed restoration design for the site. Such items of note would include stone armouring from the northern embankment of Rhaslas pond; select historical features of previous mining activities; and a short underground section of the Dowlais Free Drainage System, if encountered at depth during mining excavations, being incorporated into the surface landscape as a culvert or bridge over a reinstated watercourse.
- 3.104 The assessment of the effects of these proposals on the southern and northern embankments, together with detailed proposals for protection, recording and appropriate mitigation proposals, can be found in the 'Archaeology and Cultural Heritage' Chapter of this Environmental Statement. The full archaeological assessment of the proposed Nant Llesg scheme can also be found in the same chapter.

Fencing

- 3.105 As required by law (Regulation 16 of the Quarries Regulations 1999), the operational site perimeter is to be fenced in order to make the site secure and to discourage trespass.
- 3.106 The operational site boundary, as indicated on Planning Application Drawing MA/NL/PA/003, would be fenced with wooden post and wire stock proof fencing, the construction details of which are shown on MA/NL/PA/031. In the areas of land remediation to the south and east of the operational site boundary temporary fencing would be erected only for the duration of the works. All works in these areas would be completed within 24 months of the commencement of coaling.
- 3.107 Once the site is operational, all site boundary fencing would be regularly inspected and any damage would be repaired immediately.
- 3.108 The water treatment areas would be positioned as shown on Planning Application Drawing MA/NL/PA/003, and fenced with chain link security fencing, the construction details of which are shown on MA/NL/PA/031.

Services

- 3.109 Services crossing the site belong to National Grid, South Wales Electricity, Wales & West Utilities and Welsh Water. A 33Kv overhead power line crossing the site would be diverted prior to works on site, but all other services remain unaffected by the proposal. All services within the site would be protected where required during site operations. The permanent diversion route of the 33Kv overhead power line is shown on Planning Application Drawing

MA/NL/PA/003 and would take approximately six months to complete with no disruption to the supply. There would, therefore, be little impact on utility services or their consumers.

- 3.110 After restoration of the site, any fence erected to protect utility services would be removed unless coincident with restored field boundaries.

Water treatment areas and establishment of site drainage

- 3.111 Water Treatment Areas would be constructed before any soil stripping and/or excavation works are to be carried out. In the unlikely event of storm conditions being so severe that the water treatment facilities are overwhelmed by the volume of water directed to them, which may result in a non-compliant discharge, the working void would be flooded rather than allow the untreated and non-compliant water discharge from site.
- 3.112 Construction of the proposed water treatment areas WTA1 - WTA4 and site drainage would be carried out immediately on gaining access to the site and the site fencing being completed. The facilities would be maintained for the duration of site operations and enhanced for ecological purposes as a part of the restoration of the site. The general location of the water treatment areas is shown on Planning Application Drawing MA/NL/PA/003 and a typical WTA layout is shown on Planning Application Drawing MA/NL/PA/030.

Road Improvements and construction of site access road

- 3.113 The main site access point (Access Point A) would be on the eastern side of the 'Fochriw Road' approximately 130m to the north of the junction between the Fochriw Road and South Tunnel Road. The layout of Access Point A is shown on Planning Application Drawing MA/NL/PA/014, the detailed design of which would be agreed with the Highways Authority before the works are carried out. The access point would be equipped with signage and road markings to current highways standards. All vehicles entering the operational site, including plant delivery and removal, would enter and leave through this access point.
- 3.114 Within the site, a metalled road would be constructed from the site access point at the Fochriw Road to the workshop area as shown on Planning Application Drawing MA/NL/PA/003. Along this stretch of internal road, a vehicle washing facility would be installed at the location shown on the drawing to ensure all vehicles are adequately cleaned before entering the highway.
- 3.115 The proposed exit from Cwmbargoed Disposal Point (Access Point C), which is currently laid out as a crossing point that formerly served Phase II of the East Merthyr Reclamation Scheme that is no longer used, would be re-designed to allow right turn exit movements only out of Cwmbargoed Disposal Point.
- 3.116 It is proposed that improvements be made to the junction between the Fochriw Road and Bogey Road. These would be completed prior to any coal haulage lorries from the Nant Llesg site using the route. Improvements to the vertical alignment of the junction, better signage and additional road markings are also proposed to further improve safety at the junction. A temporary diversion route across adjacent land would be required to avoid closure of the road.
- 3.117 All such works would be carried out in accordance with a scheme to be agreed with the Local Highways Authority.

Offices, Workshop and Other Site Facilities

- 3.118 All site office accommodation, staff welfare, vehicle parking, site access, workshops and on-site coal washing and preparation facilities would be located within the operational area of the Nant Llesg mine as shown on Planning Application Drawing MA/NL/PA/003. New coal washing and water recycling facilities would be located at Cwmbargoed Disposal Point along with the existing facilities for coal stocking, washing, preparation, processing and dispatch as illustrated on Planning Application Drawing MA/NL/PA/015. These, together with the existing vehicle maintenance workshop, offices, staff welfare, vehicle parking, laboratory and other existing ancillary facilities indicated on the drawing would be retained at the disposal point and used for the duration of and in connection with coal mining activities at both the Ffos-y-fran and Nant Llesg sites. All large plant deliveries and removals to and from the Nant Llesg mine would be via Access Point 'A' on Planning Application Drawing MA/NL/PA/003 and associated commissioning and decommissioning would be dealt with within the workshop area within the Nant Llesg Surface Mine. Similar deliveries associated with any construction or decommissioning of plant at Cwmbargoed Disposal Point would be made via Access Points 'B' and 'D' on Planning Application Drawing MA/NL/PA/003.

Fuel, Oil and Chemical Storage

- 3.119 Provisions for the delivery and storage of oils, fuels and chemicals would be located at the workshop area within the Nant Llesg Surface Mine. The location of the workshop area can be seen on Planning Application Drawing MA/NL/PA/003.
- 3.120 Other service and delivery vehicles would enter and leave the surface mine via Access Point 'A' and the disposal point via Access Point 'D'. All vehicles would be cleaned at the respective vehicle washing facilities marked 'V/W' on Planning Application Drawing MA/NL/PA/003 before re-entering the public highway.
- 3.121 To protect the existing and proposed surface water drainage regimes at the surface mine and disposal point, the following provisions would be put in place.
- 3.122 Fuel, oil and chemicals would be stored in tanks contained within appropriately sized and constructed bunds to contain the effects of any spillage or leak. Such bunded storage tanks would be elevated and securely located within one or more bunded areas. All bunds would provide at least 110% holding capacity of the tanks contained within them.
- 3.123 Hoses would not be used in a manner that threatened the purpose or integrity of a bund.
- 3.124 Each storage tank would be fitted with a leak-proof dispenser gun that is locked off when not in use. Bunds would be checked for water or rubbish deposition at regular intervals and pumped and/or cleared out regularly to maintain their capacity and prevent overspill.
- 3.125 Storage areas would be inspected regularly for signs of leakage or damage. In the event of damage or a leak, appropriate action is taken to repair or replace the damaged item and all contaminated materials and associated wastes would be handled as hazardous waste in accordance with their European Waste Catalogue characterisation.
- 3.126 No fuels, oils or chemicals would be stored within 10 metres of soakaways, drains, trial pits, excavations or visible fissures.

- 3.127 Site operatives would receive training in the identification of those activities and conditions that could cause potential water pollution problems; and in the best practices to reduce the chance of a pollution incident.
- 3.128 The drainage systems for oil, fuel and chemical storage areas would be adequately trapped to remove silt, and designed to contain any accidental spillages of oil and other pollutants for appropriate removal and disposal. No trap, lagoon or sump would be located near an archaeological site.

Stripping and Storage of Soil and Peat

- 3.129 All available peat and topsoil would be stripped, for reuse, from any area that would be disturbed, except where topsoil of the same type is to be stored.
- 3.130 All available subsoil would be stripped, for reuse, from any area that would be disturbed, except where subsoil of the same type is to be stored.
- 3.131 Peat, organic and mineral soils and sub soils and any soil of ecological or other environmental interest would be stripped and stored separately to a maximum height of 5m above ground level for topsoils and subsoils. Peat would be stored in separate excavated cells, the above ground containment bunds of which would be a maximum height of 3m. All topsoils, subsoils and peat would be prevented from inter-mixing. The use of 'Teram' or other suitable geo-membrane would be employed to separate soil types where it proves impracticable to create physically discrete mounds. The methodology for handling and storing soils and peats encountered during site operations is summarised below and provided in greater detail in Appendices MA/NL/ES/A09/002 and MA/NL/ES/A09/003 to Chapter 9 of this Environmental Statement: Agricultural Land Use and Soils.

Peat

- 3.132 Peat exists at varying thicknesses across the site, generally ranging between 5cm and 30cm above clay. The distribution of peat is shown on Drawing MA/NL/ES/09/003 and is described in Appendix MA/NL/ES/A09/002 to Chapter 9 of this Environmental Statement.
- 3.133 The methodology summarised here is explained in greater detail in Appendix MA/NL/ES/A09/002 to Chapter 9 of this Environmental Statement. Generally, the peat would be removed in sequential strips using a bulldozer to push the peat into mounds or windrows and loaded by mechanical excavator into dump trucks for transportation to containment cells, where it would be stored until required for the restoration of the land. At no time would machinery or dump trucks travel over the peat.
- 3.134 The peat would be stored in containment cells so that it can be kept in a wet condition during storage. The proposed location of the cells is indicated on Planning Application Site Layout Drawing MA/NL/PA/003.
- 3.135 Such containment cells would be constructed by excavating approximately 3m into the ground with the excavated material used to raise the margins as bunds to 3m above ground-level. The overall depth of the cells would therefore be 6m and accommodate peat to a depth of 5-6m. They would be formed in and from the underlying impermeable clayey substrate with provision being made to pump water into or out of the cells to control the water-content within them.

- 3.136 Outer faces of the bunds would be hydro-seeded to grass in the first growing season.
- 3.137 The environmental assessment of the proposals for peat handling is included at Chapter 9 of this Environmental Statement: 'Agricultural Land Use and Soils'.

Topsoil and Subsoil

- 3.138 The various non-peaty topsoils and subsoils would be stripped and stored separately. The soil stripping would be of topsoil only where subsoils are not present. In areas of natural soils with a loamy subsoil both topsoil and subsoil would be stripped.

Topsoil

- 3.139 A bulldozer would be used to push topsoil into mounds or windrows from which it would be loaded by a mechanical front or back acting excavator into dump trucks for transportation to the storage mounds. If appropriate at the time, it would be transported direct to topsoil replacement areas as part of the progressive restoration task.

Subsoil

- 3.140 Once the topsoil had been stripped, a bulldozer would be used to push the subsoil into mounds or windrows, from which it would be loaded by a front or back acting excavator into dump trucks for transportation to the storage mounds, or if appropriate at the time, direct to subsoil replacement areas as part of the progressive restoration task.
- 3.141 Dozers, excavators and dump trucks would traverse over or work on areas where soils had been removed.

Soil Forming Material

- 3.142 Sufficient quantities of appropriate soil forming materials would be conserved to supplement the available topsoil and subsoil. Identified soil forming materials would be recovered and stored separately from top soils and sub soils. The soil forming material would be stored as part of the overburden storage mound shown on Planning Application Drawing MA/NL/PA/003. The material would be stored in discrete locations within the mound at locations that would be readily accessible when the materials become available during the restoration stages of site operations.
- 3.143 Once formed, all soil storage mounds would be seeded to grass at the earliest opportunity.
- 3.144 The location of the soil storage areas and an indication of the stages of soil movements are depicted in the Disposition Drawings MA/NL/PA/004 to MA/NL/PA/008.
- 3.145 The location and type of soil stored in each soil mound, together with the location of stored soil forming material within the overburden storage mound, would be surveyed and recorded. Such information would be used to inform the detailed restoration design of the site at each stage of the progressive restoration when submitted for the approval of the mineral planning authority.

Merthyr Industrial Services (MIS) Waste Facility

- 3.146 The operational area of the Nant Llesg Mine includes an existing landfill site known as the MIS Waste Facility. This landfill is an inert waste facility with a maximum 200 tonne per day import capacity under its existing waste licence. At the time of making this application the landfill site was not operational and it is understood that the planning permission for the site had expired. The site occupies areas intended for overburden storage and excavation operations within the Nant Llesg Mine.
- 3.147 The waste facility will remain until the Nant Llesg scheme is implemented. At that time, Miller Argent would assume ownership of the land. The materials within the waste landfill area are yet to be fully identified and it would therefore be necessary for further investigation be carried out both before and during waste handling operations. Final decisions as to the most appropriate handling and/or treatment of the waste would be made at the time in liaison with NRW. Any waste identified as giving rise to concern would be treated as determined necessary and/or removed to a suitably licenced site prior to mining operations progressing over that area.
- 3.148 A ground investigation of the waste site has been carried out and the corresponding report can be found at Appendix MA/NL/PA/A004 to the Planning Statement. Based on this investigation, a strategy has been developed to maximise the recycling of the excavated landfills by recovering reusable materials and selecting out unsuitable materials, which would then require appropriate treatment and disposal.
- 3.149 Any excavated non-inert waste materials would be disposed of at a suitable off site facility. The landfill would be investigated and sampled in detail, using modern criteria, prior to any excavation of the previously tipped material. The investigation would establish the wastes' pollution potential, both as currently in place and once relocated, and their suitability for remediation.
- 3.150 The section of landfill, which would not be excavated, would be covered in engineered materials recovered from site to manage landfill gas and potential leaching of the contained materials.
- 3.151 Further detail of the proposals for dealing with this waste facility and the associated environmental effects can be found at Chapter 17: Waste of this Environmental Statement.

Other Minerals

- 3.152 Stone encountered during mining excavations would be utilised for haul road construction within the site. The preparation and maintenance of serviceable roads is important in both economic and environmental considerations of the scheme. The use of fuel and tyres is sensitive to road conditions and it is important to maintain robust and well graded haul roads throughout the scheme. Likewise, well maintained and regularly wetted and graded roads provide better running surfaces and result in less dust emissions. It is therefore not anticipated that surplus stone would become available in commercial quantities and the processing and off site marketing of stone does not form part of the development proposal.
- 3.153 Where possible other minerals would be recovered when encountered for use on site, for example, clays and stone for lining ditches on site, and would be recovered for such purposes where appropriate.

Footpaths, Bridleways & the Urban Common

- 3.154 In order to develop the Nant Llesg Surface Mine and the proposed land remediation, any public rights of way currently crossing the site would need to be stopped up prior to the commencement of site operations.
- 3.155 To provide access across the northern boundary of the scheme, a formal, dedicated bridleway would be provided as Alternative Highway 'Bridleway AH1' linking Fochriw Road to an existing bridleway that further links to the highways to the east of the site. This would complement the existing routes provided by highways and public rights of way that skirt the eastern, western and southern boundaries and can be seen on Planning Application Drawing MA/NL/PA/038. 'Bridleway AH1' would be provided during site establishment works at the surface mine. The route would be created as part of the site establishment works and would follow and lie within the north-western planning application site boundary as shown on MA/NL/PA/003. The operational site boundary would lie to the south-east of the route and the route would be outside the fence of the operational area of the mine.
- 3.156 Within the first 12 to 24 months of coaling, further routes through the areas subject to early remediation would be made available as permissive paths until remediation works are complete and it is possible to create permanent rights of way. The indicative alignment of these is shown on Planning Application Drawing MA/NL/PA/038.
- 3.157 As mining operations develop, the land would be progressively restored and further permissive routes would become available until such time as the whole of the proposed replacement rights of way network is provided, the indicative layout of which is shown on Planning Application Drawing MA/NL/PA/039.
- 3.158 Further information on the proposals for public rights of way can be found later in this chapter and at Chapter 12 of the Planning Statement, and the environmental assessment of those proposals can be found in the Recreation and Tourism Section at Chapter 6 below.
- 3.159 In order to carry out works on the urban common, an application will need to be made under Section 38 of the Commons Act 2006 for consent to carry out the Nant Llesg scheme on the Gelligaer and Merthyr Common. To mitigate for the impact on the common for the duration of the Nant Llesg scheme, the application for consent will provide for additional off-site areas of land to be made available for temporary permissive public access and/or temporary 'common' grazing and permissive public access for the duration of surface mining operations, restoration and aftercare. The requirement to permit access for the duration of the scheme will be included in a section 106 agreement.
- 3.160 Further detail of the proposals for public rights of way and the urban common is provided later in this chapter and at Chapters 12 and 13 of the Planning Statement.

Mining Methodology

- 3.161 The proposed surface mining operations would be carried out by large mechanical excavators and dump trucks with attendant ancillary plant. Coal seams would be cleaned using small 25-35t excavators and loaded into on-site coal trucks and transported to an on-site coal transfer pad. Coal would then be re-loaded at this point into road-going coal lorries. These would transport the coal, via on-site vehicle cleaning facilities, onto the public highway and to

Cwmbargoed Disposal Point. All overburden, coaling and ancillary equipment used on Nant Llesg would be the same or similar to that used on the adjacent FLRS site.

Initial Stage – Development of Box Cut (Disposition 1)

- 3.162 Initially, identified peat, soils and soil forming materials would be stripped from the excavation and overburden storage areas and stored in storage mounds within the site area.
- 3.163 Plant and machinery delivered to the site via the site access point would be transported to the Plant Workshop Area shown on Planning Application Drawing MA/NL/PA/003 for commissioning and deployment to site.
- 3.164 Excavation of the initial void would commence in the west and progress in an easterly direction. Overburden from the excavation area would initially be transported to the visual and acoustic bund to the east, it is expected that the construction of this bund would take approximately 4 months. After this all material excavated in the box cut would be taken to the main overburden storage area to the south.
- 3.165 In order to minimise the potential environmental impact of the mound construction, the following measures would be adopted:
- The mounds would be constructed in layers. Outward facing elevations of each layer, particularly those facing nearby communities, would be constructed first. This enables the bulk of the work to be carried out to be screened from view behind the newly formed outward facing slopes; and
 - The side slopes and surface of the mounds would be grass seeded at the earliest practical opportunity following the completion of any section of the overburden mound construction.
- 3.166 The excavated coal would be transported to the site access point via the internal transfer pad, internal haul route and the vehicle cleaning facilities on-site. The coal lorries would leave site and turn left onto the Fochriw Road, then turn right onto the Bogey Road and continue to Cwmbargoed Disposal Point on the public highway, entering at Access Point 'A' shown on Planning Application Drawing MA/NL/PA/003.
- 3.167 When coal seams are exposed during surface mining, they would be cleaned by machine to remove as much of the adhering overburden material as is possible before the seam is excavated. These 'cleanings' inevitably include some coal and are therefore collected into piles. When the coal seam has been excavated, it would again be inevitable that some of the base of the seam remains adhered to the underlying overburden and small amounts of broken coal from mechanical excavation of the seam remain on the floor. This contaminated coal is then 'gleaned' (gathered over a period of time in small amounts) by a small dozer scraping the remaining coal from the underlying overburden. These 'cleanings and 'gleanings' are gathered together into piles.
- 3.168 During the first 12-18 months of excavation works, suitable material consisting of these cleanings and gleanings from the coaling operations and other suitable coal bearing material would be recovered and stocked on site for coal washing by 'barrel washer'. At this time an 8ft diameter 200 tonne per hour barrel washing plant would be commissioned and located along with the barrel wash feed stocks as shown on Planning Application Drawing

MA/NL/PA/003. Once commissioned, this plant would continue washing such materials for the duration of the coaling operations on site.

- 3.169 During the initial part of this stage, waste materials from the part of the MIS Waste Facility that overlie the excavation area would be excavated, sorted, recycled and treated as necessary. All non-inert waste would be transported off site to a suitable waste facility. These works would be completed within the first 12 months of starting the site.
- 3.170 The end of the Initial Stage (the box-cut) is depicted on Disposition Drawing 1 (Planning Application Drawing MA/NL/PA/004) which illustrates the movement of materials referred to above.

Second Stage – Development to Maximum Void (Disposition 2)

- 3.171 Once the box cut is completed, the site would move into the second stage of works. Mining excavations would progress in an easterly direction with overburden movements to the Southern Overburden Storage Mound with some used to progressively backfill the advancing void.
- 3.172 By the end of this stage, the southern overburden mound would have been completed and would have been progressively seeded to grass.
- 3.173 Some of the overburden would be used to continue progressive backfilling of the void to near restoration contours. Following this, the area would be progressively restored with soils and/or soil forming materials being re-spread, the area stone picked, cultivated and planted or re-seeded to the designed restoration profile. All such works would be carried out according to a detailed restoration scheme to be agreed with the mineral planning authority.
- 3.174 Coal movements and coal washing at the Barrel Wash plant would continue throughout the stage.
- 3.175 During this stage, in order to accommodate changes in the plant complement and to facilitate repairs and renewals, it is likely that further plant and machinery would be delivered or removed via the main site access point.
- 3.176 The end of the Second Stage is depicted on Disposition Drawing 2 (Planning Application Drawing MA/NL/PA/005) which illustrates the movement of materials and the progressive restoration referred to above. After this point in time, no more material would be hauled to the overburden mound and all further overburden excavated would remain within the working void and be used for progressive restoration.

Third Stage –Maximum Void to End of Coaling (Dispositions 3 & 4)

- 3.177 The excavation would progress to its most easterly position and coaling operations would progress to maximum depth, recovering the last of the proven 6 million tonne reserve. Overburden movements during this stage would be entirely within the working void with no material being hauled to the overburden mound.
- 3.178 Coal movements and coal washing at the Barrel Washing Plant would continue throughout the stage.

- 3.179 Disposition 3 (Planning Application Drawing MA/NL/PA/006) depicts the point when the top of the working void reaches the eastern limit of excavation for coal working. Up to this point all overburden excavation plant would remain in the working void and all overburden would be hauled internally within the void. After this point in time, plant would be released progressively to work in the southern overburden mound to start the backfilling of the void. These works would start approximately 18 months before the completion of coaling.
- 3.180 Material would be removed from the overburden mound in a reverse order to its formation: the material would be removed in layers, working from the sides facing away from nearby communities first and leaving a perimeter bund to screen most of the operation until it too is removed.
- 3.181 Progressive restoration would continue over the backfilled area according to the agreed restoration scheme, with further soil forming material being identified and recovered from the area of the void in preparation for the final rehabilitation task.
- 3.182 Disposition 4 on Planning Application Drawing MA/NL/PA/007 depicts the point in time when coaling is completed and all excavators would then be moved to work on the return of the overburden mound to the void.
- 3.183 During this stage, plant and machinery would continue to be occasionally delivered or removed via the site access point.
- 3.184 The Third Stage of works is depicted on Dispositions 3 and 4. Planning Application Drawings MA/NL/PA/006 and MA/NL/PA/007 illustrate the activities referred to above.

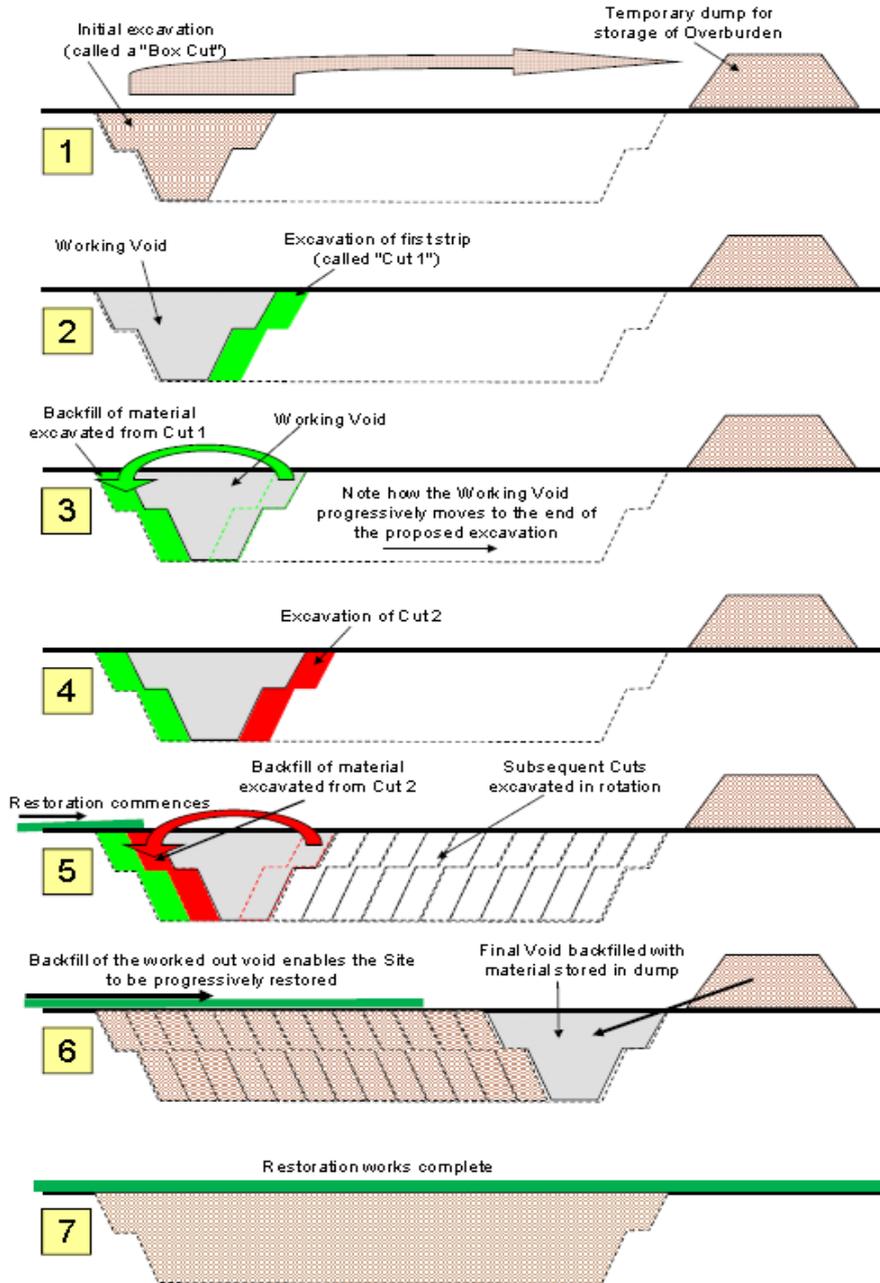
Fourth Stage - Final Restoration

- 3.185 During this stage overburden would be returned initially from the southern overburden mound, as shown on Disposition 5 (Planning Application Drawing MA/NL/PA/008), and sub-soil, topsoil and soil forming materials would be placed to achieve the restoration profile with progressive rehabilitation extending to the east.
- 3.186 Restoration of the main overburden area would then commence with re-profiling and re-soiling in preparation for its rehabilitation.
- 3.187 Finally, in this stage, the visual and acoustic bund would be removed, also in layers, and the soil and sub-soil storage areas to the east of the coal working excavation area would be removed/re-graded and the area prepared for rehabilitation.
- 3.188 Coal movements would have ceased by the beginning of this stage and the internal haul route to Fochriw Road would remain only to facilitate the movement of small plant and personnel and ultimately for all heavy plant and equipment to be transported off site. The haul route would then be restored and the office, workshop, coal storage and barrel wash areas would be removed and the area they occupied restored.
- 3.189 The final restoration strategy for the site is illustrated on Planning Application Drawing MA/NL/PA/009 and Environmental Statement Drawing MA/NL/ES/016/012-2. This shows in conceptual terms the main land uses and features proposed for the site. The restoration strategy would form the basis of detailed restoration designs of each stage of the progressive restoration being submitted for approval by the Mineral Planning Authority at the appropriate

- time; such approved detailed restoration proposals being required in advance of each of the various restoration stages.
- 3.190 Each stage of the progressive restoration would involve soils and/or soil forming materials being re-spread, the area stone picked, cultivated and planted or re-seeded in accordance with the detailed restoration schemes. All such works would be carried out according to the detailed restoration scheme that would have been agreed with the mineral planning authority prior to the works being carried out.
- 3.191 The procedures for replacing peaty soils are set out in Appendix MA/NL/ES/09/002 to Chapter 9 of this Environmental Statement and those for replacing non-peaty soils can be found in MA/NL/ES/09/003 to Chapter 9.
- 3.192 Generally, peaty soils would be laid over a pre-prepared clayey basal layer, effectively the original clayey subsoil. Peat would be delivered alongside by dump truck to areas that have been loosened and roughened and pushed into position to the specified thickness with a tracked bulldozer.
- 3.193 Non-Peaty soils would be replaced by one of three methods according to the soil resources presently available at Nant Llesg:
- The more traditional method of replacement of subsoil followed by a layer of topsoil. This would be suitable for areas where both topsoil and subsoil were originally removed;
 - Where only a layer of topsoil would be replaced. Suitable for areas where only topsoil material was originally found (e.g. previously restored opencast areas where little or no soil resources were originally available);
 - Where there would be no topsoil layer, but the required afteruse would be established directly on suitable soil forming material. Suitable for areas where no soil resources are presently available.
- 3.194 The soil would be delivered by dump trucks to the location where they were to be used and spread, as appropriate, by excavator bucket or light tracked bulldozer. This would avoid unnecessary soil compaction, but any significant compaction remaining would be relieved by separate loosening operations.
- 3.195 Soil handling would not take place during extended periods of wet weather.
- 3.196 The progressive restoration would be followed by initial rehabilitation works and a programme of aftercare for a minimum period of 5 years. Particular attention would be paid to grazing control, appropriate fertiliser application (where appropriate), soil structure development and drainage necessary to achieve the standards of agricultural land, conservation and woodland restoration required by the mineral planning authority. In addition, attention would be paid to the establishment and diversification of the natural and semi-natural vegetation types proposed in the wetland, woodland, pond margin and other conservation areas.
- 3.197 Figure 4.3 shows the schematic sequence of the working methodology, and illustrates the progressive restoration that would occur as coal working operations progress eastwards across the site.

3.198 The restoration strategy and proposals for aftercare of the land are explained further later in this chapter.

Schematic Sequence of Surface Mine Working Methodology



Site Access and Coal Haulage

Site Access Point

- 3.199 There would be a single access point to the surface mine off Fochriw Road on the western boundary of the site. The location of this access point is shown as 'Access Point A' on Planning Application Site Layout Drawing MA/NL/PA/003. Access Point A is approximately 130m to the north of the junction between Fochriw Road and South Tunnel Road.
- 3.200 The proposed layout for Access Point A is shown on Planning Application Drawing MA/NL/PA/014, the detail of which would be appropriately designed in agreement with the Highways Authority. The access point would be equipped with signage and road markings to current highways standards.
- 3.201 Access Point A would be used for general access to the site by all staff and operatives, visitors, service and delivery vehicles. It would also be used by coal lorries travelling between the mine and Cwmbargoed Disposal Point.

On-Site Vehicle Washing Facility and Internal Access Road

- 3.202 The vehicle washing facility would be a fully automated facility located on site at the location indicated on Planning Application Drawing MA/NL/PA/003. Details of a typical installation can be found at Appendix MA/NL/PA/A006 to the Planning Statement. The facility would be used by all vehicles leaving the operational area of the surface mine before travelling along the metalled internal road south to Access Point 'A'. Consequently, all vehicles leaving the operational area of the site to enter the public highway at Access Point 'A' would have been washed and travelled a distance of some 600m on a clean metalled road surface before entering the public highway. Those vehicles leaving the clean area of the office and staff welfare facility would not be required to be cleaned before entering the highway, travelling only over approximately 160m of clean metalled road before leaving the site.
- 3.203 The external casings of the underbody and wheel washing equipment would be painted 'Olive Green'; Corus Colour Code HPS200 or equivalent.
- 3.204 No vehicle leaving the operational area of the mine would be permitted to enter the public highway without passing through the vehicle washing facility.
- 3.205 In the event that the automated system becomes non-operational for a period, whether that be due to mechanical breakdown or extreme adverse weather conditions, the system would be supplemented by the provision of a high pressure hose and 'lance' for manual operation by an operative. In such circumstances, Miller Argent would use all reasonable endeavours to bring the primary automated system back into operation at the earliest opportunity.
- 3.206 At no time would vehicles be permitted to leave the vehicle washing area in such a condition as to deposit mud and/or debris on the metalled surface of the internal access road south of the facility. In such circumstances, vehicles would be required to return to the vehicle washing area to be further cleaned before being permitted to leave the surface mine.

- 3.207 The access road between the vehicle washing facility and Access Point 'A' would be kept clean at all times. Suitable road cleaning equipment would be maintained for the duration of operational activities at the site to attend to the removal and cleaning of any inadvertent spillage or the inadvertent carrying of muck onto the clean asphalt surface of the access road or public highway.

Cwmbargoed Disposal Point Access Points

- 3.208 The access points to be used by coal lorry traffic for gaining access in and out of Cwmbargoed Disposal Point are both well-established existing access points off the Bogey Road. They are identified on the Planning Application Site Layout Drawing MA/NL/PA/003 as Access Points 'B' and 'C'.
- 3.209 Access Point 'C' would require minor works to provide suitable radius kerbing and signage to permit right-turning vehicles only on leaving the disposal point.
- 3.210 Inbound coal lorry journeys from the Nant Llesg Surface Mine would enter Cwmbargoed Disposal Point at the existing Access Point B.
- 3.211 For the return journey the coal lorries would leave Cwmbargoed Disposal Point from the existing Access Point C, approximately 125m to the west of Access Point B, and turn right onto the Bogey Road.
- 3.212 Before leaving the disposal point, all lorries would be washed and those delivering coal to customers would be sheeted.
- 3.213 A fully automated vehicle washing facility currently exists within the disposal point for use by all vehicles prior to entering the public highway; the location of the vehicle washing facility is shown on Planning Application Site Layout Drawing MA/NL/PA/003.
- 3.214 In the event of the automated system failing for any reason, a manual back up system is maintained at the wash-bay for immediate deployment. The backup system consists of a high pressure hose manned by a site operative until such time as the automated system is once again fully operational.
- 3.215 The external casings, screening and wheel washing facility are painted 'Olive Green'; Corus Colour Code HPS200.
- 3.216 No vehicle that has left the operational site would be permitted to access the public highway from the disposal point without first passing through the vehicle washing facility. The area including the washing facility is covered by the disposal point internal closed circuit television system, which would be used to record and identify any non-compliance with this procedure so that remedial action can be taken if required.
- 3.217 The access road between the vehicle washing facility and Access Point 'C' would be kept clean at all times. Suitable road cleaning equipment will be maintained for the duration of operational activities at the disposal point to attend to the removal and cleaning of any inadvertent spillage of mud, coal or debris onto the public highway or the before mentioned access road within the disposal point.

Coal Haulage Route

- 3.218 All coal from the site would be transported to Cwmbargoed Disposal Point for processing and onward dispatch to customers. Coal would enter Cwmbargoed Disposal Point at an existing Access Point 'B' off the 'Bogey Road' and leave the site from a second existing access point a little further to the west at Access Point 'C'. The proposed haul route between the site and Cwmbargoed Disposal Point is shown on Planning Application Drawing MA/NL/PA/003. The coal haulage route for delivery of coal to the disposal point would include some 680 metres of public highway, while the return route would include some 805 metres.

Hours of Working

Table 3.3 - Proposed Nant Llesg Surface Mine - Operational hours

Days	Hours of Working
Weekdays	0700 – 1900 hrs
Saturdays	0700 – 1400 hrs
Sundays	No Working
Public & Bank Holidays	No Working

Table 3.4 - Proposed Cwmbargoed Disposal Point - Operational hours (as existing)

Days	Hours of Working
Weekdays	0600 – 2200 hrs
Saturdays	0700 – 1800 hrs
Sundays	No Working
Public & Bank Holidays	No Working
Train Loading and Dispatch	24hrs.

- 3.219 All operational activities would be contained within the above periods with only maintenance and emergency operations being carried out at other times. It is stressed that the above proposed hours reflect the current operating hours of the disposal point, within which the facility has operated without problem or related complaint since 2008. To enable the efficient and effective operation of the existing and proposed plant to ensure the processing of volumes of coal in line with the required rates of production it is important that the disposal point facilities be permitted to continue to operate over current permitted hours for the combined duration of coaling operations at the Nant Llesg Surface Mine.

- 3.220 Notwithstanding the hours of operation proposed above, in the interests of minimising potential environmental effects, it is proposed that, during periods of dry windy weather, water bowsers may also operate on Sundays and Bank Holidays between 0700 – 1800 hrs.

Hours of Coal Extraction & Haulage

- 3.221 Coal would be extracted and hauled by lorry to the adjacent Cwmbargoed Disposal Point between the hours of 0700 - 1900 hrs Mondays to Fridays and 0700 – 1400 hrs on Saturdays. It is anticipated that coal haulage vehicles of 20 tonne capacity would be used, and with a maximum rate of production of 750,000 tonnes per annum, 781 loads would be transported from the Nant Llesg site to Cwmbargoed Disposal Point each week (approximately 142 loads per day) with the corresponding number of return journeys.

Hours of Blasting

- 3.222 Blasting would only take place over periods of very short duration between 1000 -1300 hrs and 1400-1600 hrs Mondays – Fridays, and 1000-1300 hrs on Saturdays. There would be no blasting on Sundays or Bank Holidays.

Coal Production, Processing and Dispatch

- 3.223 It is proposed that up to 750,000 tonnes of coal per annum would be mined from the Nant Llesg Surface Mine. All coal so mined would be taken to Cwmbargoed Disposal Point for processing and onward dispatch to market.
- 3.224 Historically, Cwmbargoed Disposal Point has been considered to have the capacity to process up to 1.5m tonnes per annum. Whilst that remains the case for the existing plant, it is now intended that, with substantial capital investment, the provision of a new high capacity 400 tonne per hour washing and screening plant on site would enable a large fraction of the coal to be processed to a higher specification independently of the existing plant. This increases the potential capacity of the disposal point to about 1.75m tonnes per annum.
- 3.225 A 400t/hr dense medium cyclone washing plant would be located within Cwmbargoed Disposal Point at the location shown on Planning Application Drawing MA/NL/PA/003 and is described later in this Chapter. The washing plant would be housed in a purpose-designed building in order that any noise and dust impacts are kept to a minimum. An ancillary water recycling facility would also be provided to ensure sufficient surface water is collected and stored to maintain operation of the plant during periods of dry weather.
- 3.226 As a contingency for washing Ffos-y-fran coals, should planning permission for the Nant Llesg scheme be refused, a standalone planning application has already been submitted to Caerphilly County Borough Council for the same washing plant at the same location. However, if the Nant Llesg scheme is permitted, there would be an increase in coal processing and washing operations within the plant, over and above those stated in the standalone application. This proposal deals with the scenario for the Nant Llesg Surface Mine, where coal would need to be processed from both the Ffos-y-fran and Nant Llesg surface mines.
- 3.227 Nant Llesg coaling operations would overlap considerably with those on the Ffos-y-fran Land Reclamation Scheme and coals from both sites would for the majority of the Nant Llesg project

be processed at Cwmbargoed Disposal Point at the same time. It must be stressed that, regardless of the source of coal tonnages delivered to Cwmbargoed Disposal Point, a maximum of 50,000 tonnes of coal per annum would be dispatched from Cwmbargoed Disposal Point by road. This would accord with the current maximum permitted dispatch of coal by road via Cwmbargoed Disposal Point under the planning permission for the Ffos-y-fran Land Reclamation Scheme. All other coals would be dispatched by rail.

3.228 There is currently no planning restriction on the amount of coal that can be imported, processed and exported via Cwmbargoed Disposal Point. However, in order to identify the potential maximum impacts for the purpose of the environmental impact assessment, it has been necessary to set the maximum tonnage of coal that would pass through the disposal point. The following determinants have been used:

- The Nant Llesg Surface Mine is likely to produce a maximum of 750,000 tonnes per annum;
- The Ffos-y-fran Land Reclamation Scheme is likely to produce a maximum of 1,000,000 tonnes per annum;

3.229 In the context of anticipated demand from customers (see Chapter 15.0 of the Planning Statement), and with the addition of the new coal washing plant, there is a possibility that up to a maximum of 1,750,000 tonnes of coal could be dispatched per annum. The scheme thus makes provision for this volume to be processed at Cwmbargoed Disposal Point during any one year, with 1,700,000 tonnes likely to be dispatched by rail and up to 50,000 tonnes being dispatched by road. This would include all coal to be produced by the Ffos-y-fran Land Reclamation Scheme and the Nant Llesg Surface Mine and has been the figure used for assessment purposes in the Environmental Impact Assessment.

Site Liaison Committee

3.230 A Site Liaison Committee consisting principally of representatives of the local authority, local residents and Miller Argent would be set up and provide a forum for local representatives, to discuss site matters and any impact of site operations beyond the site boundary. It would provide an opportunity for queries to be brought forward and for information about activities on the site to be exchanged.

3.231 The Site Liaison Committee would be chaired by a member of the local planning authority and have a balanced representation to be agreed by the committee as and when appropriate.

3.232 An Environmental Liaison Officer would be provided by Miller Argent, who would be a member of the site liaison committee and would be responsible for dealing with complaints and reporting matters to the committee along with information about environmental monitoring and relevant activities on site.

Complaints

3.233 A notice board would be erected at the entrances to the site showing the address and telephone number of the Environmental Liaison Officer, who would be responsible for dealing promptly with complaints that may arise.

Planning Policy Context

- 3.234 The working scheme has progressed through a series of design iteration in terms of the limits and depth of the coal working excavation area; the amalgamation and re-profiling of the original overburden mounds into a single mound with a smaller footprint, avoiding the southern embankment of Rhaslas Pond; identification of a main operational area and the relocation of operational activities within it; protection of the valuable cultural heritage interests and incorporation of mitigation measures; incorporation and remediation of landfill; provision of visual and acoustic screening; routing of coal lorries; highway improvements; nature and spatial extent of the remediation works in the wider area; the mitigation measures, notably in terms of off-site biodiversity and common land compensation, compensation for the occupation of common land and the form and nature of the restoration strategy. These iterations have been informed by the results of the EIA process and consultation with the local communities and key stakeholders.
- 3.235 Importantly, the development has been designed to ensure that the limits of coal extraction are set at a distance of 500m from the settlement boundary at Rhymney, noting that the distance to residential property in the built up area of Rhymney is some 680m from the coal working excavation area at its closest point and more generally some 800m (see MTAN2 paragraph 29). Moreover, whilst the scheme includes proposals for remediation works and mitigation measures within 500m of the settlement boundary, these would be short term operations designed to provide additional mitigation during the coaling operations, and lasting environmental and safety benefits associated with the remediation of old mine shafts and adits. The LDP does not contain advice on specific stand-off distances. These operations do not involve coal working and in any event fully comply with the sentiments of “exceptional circumstances” for operations within 500m of a settlement boundary (see MTAN2 paragraph 49), noting that the remediation works would be confined to localised capping and similar measures, and would not involve the extraction of coal as part of them.
- 3.236 The design iterations set out in more detail in Chapter 4: Site Selection and Alternatives of this Environmental Statement have provided the basis for the development scheme which is now proposed. The Applicants consider that the proposed scheme represents the optimum environment design solution and a robustly engineered and deliverable development proposal. The scheme itself reflects the design principles and criteria which have been set, and incorporates substantial in-built environmental and amenity impact mitigation measures. In planning policy terms, these have been designed to ensure that the development could proceed in a way which mitigates the effects to within “*acceptable limits*” (see MPPW paragraph 5), and with “*no lasting environmental damage*” (see MPPW paragraph 62).
- 3.237 These issues are discussed in more detail in the planning policy section of the Planning Statement at Chapter 17.

Restoration and Aftercare of the Land

Restoration Strategy

Aims and objectives

- 3.238 The restoration strategy is put forward in the context of discussions with officers of CCBC, which established that, rather than the land being restored to a formal recreational use such as a country park, it would be preferable to provide for informal recreational uses, incorporating commons grazing, open access land, footpaths and bridleways to act as links between the already established Cwm Darran and Bryn Bach Country Parks. CCBC also indicated that the provision of public access should be sympathetic to the existing ecological, nature conservation and cultural heritage interests and any created as part of the restoration scheme.
- 3.239 The aim of the restoration strategy is to deliver these aspirations whilst restoring a landscape in keeping with and enhancing the landscape character and amenity of the area, integrating landscape objectives with those for nature conservation, cultural heritage, land use and access for recreation and amenity.
- 3.240 Within that overall aim, there are a number of objectives for the strategy:
- To provide a range of landscape character reflecting the landscape patterns of the area and to reintegrate the site into its surroundings and upgrade its contribution to the setting of Rhymney;
 - To improve accessibility to the public and connection with nearby communities, and increase the amenity value of the site to the community;
 - To provide a range of habitats offsetting the habitat loss due to the operations and enhancing other habitats within the site; and
 - To reflect the history and archaeology of the area in landscape features, and provide access to the public and information about the cultural heritage in the site.
- 3.241 An aspect of the upgrading of the amenity for the public is the opportunity for interaction with the nature and heritage interests, existing and new, and reconnection with the natural and cultural landscape.
- 3.242 The strategy for restoring the landscape of the site is shown on Planning Application Drawing MA/NL/PA/009 and Environmental Statement Drawing MA/NL/ES/016/012-2.
- 3.243 Zones of distinctly different character can be discerned in the present landscape of the site, described in Chapter 16 of this Environmental Statement, which are to be reflected in the restored landscape.

Preliminary Restoration

The Southern Land Remediation Area

- 3.244 The southern land remediation area to the south of South Tunnel Road and extending around the west of Fochriw is shown coloured light blue and yellow on Planning Application Drawing MA/NL/PA/003. The area is referred to in the ecology and LVIA Chapters of this ES as the 'Lapwing Area' in recognition of the importance of the area as a nesting site for Lapwing; particularly the northern part coloured light blue on the drawing. The 'Lapwing Area' is identified more accurately on Environmental Assessment Drawing MA/NL/ES/016/012-1.
- 3.245 Although forming part of the application site, the 'Lapwing Area' would be largely undisturbed during operations and would remain much the same as it is today within the restored landscape. The majority of this land would be managed during the operational period for the benefit of the ecology (principally lapwing that nest on the open ground) and would be left largely in its current condition. Minor management works carried out during operations and outside the nesting season would provide scrapes and land qualities suitable for the lapwing.
- 3.246 The southern part of the area, generally coloured yellow on Planning Application Drawing MA/NL/PA/003, would undergo remediation to address drainage problems affecting Cwm Darran Country Park Lake. This would consist primarily of a drainage solution, with bare areas of colliery spoil reseeded with geotextiles being incorporated where appropriate to stabilise the surface and help integrate those works into the ecologically interesting adjacent landscape. These works would be carried out early in the life of the scheme, being completed within 12 – 24 months of the commencement of coaling operations and are referred to in some of the following chapters as 'Disposition 0' of the scheme.
- 3.247 Where the vertical alignment of a short length of Fochriw Road is to be altered to improve the sight-lines to the road junction, the shallow cutting that would be formed would be married into the adjacent landform and grassed, and the area of the temporary diversion on the land to the east while the road works are carried out would be restored to upland grassland.
- 3.248 The north-eastern boundary of this area is marked by the route of a former railway line, which continues southwards through the eastern part of the area, and along which a bridleway is proposed to link Fochriw with the main part of the restored site and the wider access network.

The eastern valley side

- 3.249 The southern part of the valley side has been included in the site area in order to allow remediation of hazards and tips remaining from old mines, which will require localised works while the majority of the area will remain undisturbed. The central and northern part of the area also contains old mine hazards which are to be remediated. As well as mining features of more recent cultural heritage interest, there are prehistoric remains of archaeological interest. These areas and features would be identified and retained wherever possible to be incorporated within the restoration design.
- 3.250 The land along the eastern valley side would be restored to fields of pasture, in a similar pattern to the northern slopes. The Rhymney valley side is sub-divided by stream valleys, along which woodland would be established and extended along part of the lower slopes near the industrial estate. A pattern of small fields divided by hedgerow would be established along the mid-

slopes with larger fields divided by stone walls on the upper slopes. At the heads of these valleys, small basins of more gentle slopes would be formed, and peat laid over clay to encourage the development of wet heathland.

- 3.251 As in the rest of the site, small ponds suitable for great crested newt would be established at intervals to extend the habitat for this species around the site.
- 3.252 The restoration landscape here is also intended to contribute to the landscape setting of Rhymney providing a strong landscape pattern on the ridge side. In views from Rhymney, the ridge side landscape pattern would become apparent in the medium term, as the planting carried out in years 1-2 would be established. The stone wall field boundary and other features on the higher levels would be instantly apparent after construction, providing the transition from the hedge-bound fields and woodland on the lower slopes to the open ridge top of upland grassland. The 'Bent Iron' would be reinstated on the high point of the ridge and visible from many points in Rhymney, the stone faced terrace feature in which it would be placed giving it emphasis.

Main Operational Areas: Restoration Strategy Principles

The open upland

- 3.253 The open urban common land and access land would be restored with upland grassland over most of the area. In the south, between Rhaslas Pond and South Tunnel Road, peat saved from the initial soil stripping would be laid over recovered clays to provide landform and drainage conditions suitable for development of wet heathland.
- 3.254 The western margins of the operational site would remain undisturbed throughout the operations and the restoration landform and vegetation would be merged with the existing. Small ponds would be established along the western margin of the area, at intervals suitable for great crested newt habitat, extending the habitat along the western boundary.
- 3.255 The open upland landform would be gently undulating with basins and valleys where surface water runoff can collect and be directed to watercourses that would reconnect with those beyond the site boundaries. A water treatment area in the south-east of the open upland, required for mining operations, would be restored to a marshy or wetland area, drained by an existing stream via the pond just beyond the south-eastern site boundary.

Rhaslas Pond

- 3.256 Partial restoration of Rhaslas Pond as an open water body is proposed. Cadw have identified the southern embankment as the largest and best preserved component of the Dowlais Free Drainage System, which is being considered for scheduling as an Ancient Monument. The retention of the footprint of the pond and the southern part of the open water would therefore be desirable. For the purposes of this application the southern embankment has consequently been treated as a Scheduled Monument and this area of the scheme has been carefully designed to facilitate the protection of this important asset. The northern embankment of Rhaslas Pond is not in a good state of preservation and would be removed in the course of the operations.

- 3.257 The northern part of Rhaslas Pond would be in-filled to provide support facilities for the surface mine, but the southern embankment and the southern part of the pond would be retained throughout surface mining operations. On restoration, the mining support facilities would have been removed and the northern edge of the retained pond would be graded to provide conditions for development of a broad wetland margin.
- 3.258 The alignment of the northern embankment of Rhaslas Pond would be defined within the restored landscape enabling visitors to visualise the former extent of the water body. The location of the northern embankment would be marked by a raised earth bank with a footpath along it, using recovered stone from the original bank to clad it or as marker stones along its southern face.
- 3.259 It is proposed to retain parts of the water treatment area in the south-east of the main operational area in reduced form, as part of the cultural heritage “story” expressed in other parts of the restored site. It is envisaged that the lagoons would be re-engineered to forms reminiscent of the Dowlais Free Drainage System, having placed material within them to reduce their depth, to retain them as remnants of this phase of industrial activity in the landscape. The design of these restoration features would be part of the detailed restoration design that it is anticipated will be submitted at each stage of progressive restoration as a requirement of a planning permission.

The northern slopes

- 3.260 This area, to the north of the open access land, slopes northwards to Cwm Carno and presently consists of pasture surrounded by trimmed hedges on banks with gappy vegetation and occasional struggling trees. It is a made landscape, restored from previous and somewhat pioneering opencast workings.
- 3.261 This area would be restored to enclosed fields of pasture, similar to the layout of the present landscape, with improved hedgerow and woodland planting. On the lower slopes, the restored fields would be smaller and divided by hedgerows. New woodland belts would be established along the field boundaries on the mid-slopes. The upper fields would be larger and would extend up to the edge of the common/access land, reflecting the historic pattern but restoring a formerly characteristic feature of the landscape to a higher standard than currently.
- 3.262 This pattern is part of the transition from the lowland valleys to the open upland and would be appreciated in views from the north, including parts of the A465 Heads of the Valleys Road.
- 3.263 The water treatment area in the north-east of the area, required for the operations, would be removed and the land restored to pasture. In the north-west of the area, a stream course would be reinstated, and an area of flatter land along its course formed to encourage the development of marshy grassland. More small ponds would be established along the mid-slopes, again at intervals suitable to extend the great crested newt habitat around the site.
- 3.264 A farm access track would be provided, running along the mid-slopes, linking the track near the industrial estate to the east with the track linking with the Fochriw Road near Half-way House to the west. Public rights of way would be reinstated, although the alignments may be modified in some places to allow routes to follow field boundaries and to avoid crossing and re-crossing the common land boundary wall. The Rhymney Valley Ridgeway Walk passes through this area and would be restored.

Ecological features

- 3.265 As referred to above the restored landform would include a range of features which would deliver ecological benefits. These would include:
- retention of existing features where possible and their protection during the operation of the site;
 - restoration of features which would have been removed during the site operations; and
 - creation of new wildlife habitats.
- 3.266 Existing features which would be retained and protected would include the area in the south of the site which is used by nesting lapwing. This area (owned by Caerphilly CBC) is included within the site to allow remedial work to be undertaken to reduce erosion of the former Fochriw Tip which results in pollution of the Nant Bargod Rhymni and silting of the lake in Parc Cwm Darran downstream. The extent of the works in this area would be kept to a minimum to avoid damage to the area used by the lapwing and its restoration would reflect its use by lapwing.
- 3.267 The western margin of the site, which includes a number of marshy areas and ponds, would be retained and protected during the mining operations. Other ponds and reptile habitat would be created in the east of the site at the outset of the scheme to provide habitat into which amphibians and reptiles would be transferred from the operational areas of the site in advance of the commencement of the mining operation.
- 3.268 Habitats which would be restored at the end of operations would include areas of wet heath and marshy grassland to the south of Rhaslas Pond. So far as practicable, the topography, hydrology and soil conditions in these areas would be reinstated to encourage the development of the desired vegetation. Appropriate seed mixes would be sown and the land carefully managed during the aftercare period. Areas of marsh would be reinstated on clay soils at the heads of watercourses which would be created to drain the site to form similar habitat to that which currently occurs in similar situations within the site.
- 3.269 New habitats which would be created on completion of the scheme would be a network of hedgerows and small woodlands in the north of the site. Some of the water treatment areas would be reinstated to form wetland areas and a number of ponds would be created in suitable areas around the margins of the site.

Cultural heritage features

Aims

- 3.270 The aim is to use the cultural heritage assets to:
- Tell and illustrate 'stories' in the restoration design, mostly related to local history of Common Land agricultural uses and mineral exploitation by quarrying and mining - allowing tangible and intangible heritage to be integrated;
 - Link up the stories related to other themes, mainly those related to the natural environment. A key component for cultural heritage is the Dowlais Free Drainage System;

- Give a character to the landscape with modern and historic elements, which otherwise would all be new creations;
 - Forge heritage trails with key themes, traversing Merthyr and Gelli-Gaer Commons and connecting with those established for the restoration scheme for the Ffos-y-fran Land Reclamation Scheme ;
 - Allow for future research and celebration;
 - When possible, incorporate the few known older archaeological assets, of prehistoric to mediaeval age, into the restored landscape.
- 3.271 Within all areas where the ground surface will be removed to enable the scheme to progress, it is assumed that all archaeological features will be removed. Generally, archaeological features are shallow and sit on and above the natural sub soils. Studies have identified archaeological sites spanning prehistoric times to the 20th century. For these cultural heritage resources, there is a mitigation programme of archaeology, variously occurring before and during the early stages of implementation the scheme. Also, the scheme involves land remediation, particularly making safe mine shafts and adits. These are commonly associated with surrounding industrial related activities. Again the undertakings will involve appropriate archaeological mitigation works.
- 3.272 Within the scheme the south embankment of Rhaslas Pond would be retained in the scheme design, especially as it is being considered for scheduling as an ancient monument by Cadw.
- 3.273 Otherwise, within the area where there would be ground disturbances, shallow or deep, the scheme offers no opportunity to replace the remains, mostly related to their type and condition. One exception is where structural remains of the Dowlais Free Drainage System within the deep mined seams would, if encountered, be dismantled in part and a section of the structure, which is thought to be of an arched masonry construction, reconstructed within the restored landscape.
- 3.274 The scheme offers opportunities to retain some archaeological sites, these being within areas around the perimeter of the Nant Llesg site and there the landscape restoration design promotes conservation of the retained natural heritage. Such resources are generally buried but where there is some surface expression as to their type and character, they would be investigated, aiming to understand them better, undertake any conservation that may be necessary, and so they can be promoted as a visitor attraction.
- 3.275 Two specific areas for using the as-found archaeological sites are identified on the eastern side of Nant Llesg, generally bordering the modern Rhymney industrial estate. Here there are distinct hill slope drainage valleys that are to be retained and enhanced for recreation and educational activities.
- 3.276 Part of the landscape restoration envisages cultural heritage links with the Ffos-y-fran Land Reclamation Scheme landscape when restored, where some highly significant cultural heritage sites are retained, including Sarn Howell scheduled monument, the listed aqueduct, restored and repositioned by Miller Argent across the deep cutting of the GWR, and Ffos-y-fran industrial village scheduled monument. These also lie within the Merthyr Tydfil registered historic landscape.
- 3.277 The Rhymney Valley Ridgeway Walk long distance path, various bridleways and other rights of way and footpaths will forge enhanced links to Gelli-gaer Common Lands, which is a registered

historic landscape containing a collection of scheduled monuments. These are more comprehensively described in the section on 'Access and Links' below.

Access and Links

- 3.278 The open upland and lapwing areas are open access land as defined under the CROW Act, where there is a right for the public to enter and remain for the purpose of open-air recreation on foot and where access is not confined to defined public rights of way. The areas are indicated on Environmental Statement Drawing MA/NL/ES/16/007. This land is also registered as urban common land as defined by Section 193 of the Law of Property Act 1925, forming part of the Gelligaer and Merthyr Urban Common (CL38) over which the public have a right of access for air and exercise, including the right to ride on horseback.
- 3.279 The formal right of public access on the operational land would be suspended during operations and would be reinstated once restoration and remediation works cease, but permissive access and routes would be retained in areas identified for early remediation. The public rights of way within the site would also be stopped-up during operations in order to allow surface mining works to proceed, including the remediation of old mine hazards and for alternative routes to be incorporated in the restoration proposals. The approach taken in the restoration strategy is to reinstate strategic or promoted routes, reinstate or realign other routes as required, to "fit" with the restoration landscape patterns and features, and provide new routes and links as additional access benefits.
- 3.280 The restoration routes would be linked with existing routes in the surrounding area and gaps filled where necessary to ensure better access, especially for the nearby communities (See Planning Application Drawing MA/NL/PA/009). Further detail of the strategy for dealing with the public rights of way that cross the site can be found later in this chapter.
- 3.281 Importantly, however, although not currently a registered public right of way, a Rhymney Valley Ridgeway Walk would be provided, albeit with some variation to its published alignment so it relates well with the landscape features of the restoration design. It would be way-marked, with signposting where it is accessed from the surrounding area and marker cairns at strategic points along the route through the site.
- 3.282 A new bridleway, suitably created for use also as a cycleway, would be established in advance of operations along the lower slopes of the Rhymney valley side, linking with existing bridleways and cycleways or minor roads, to mitigate for the temporary loss of the majority of the Rhymney Valley Ridgeway Walk route during that period. It would remain in place as a permanent additional public right of way following restoration of the site.
- 3.283 Another new bridleway would be established along the line of the disused railway that formerly ran between Fochriw and Dowlais Top. It would be extended northwards to link with the bridleway to the north, which in turn links with the Rhymney Valley Ridge Walk at the north-eastern corner of the site and with National Cycle Route (NCR) 48.
- 3.284 The route presently provided by Gelligaer Footpath FP151, following the western margin of the site, would be restored to a similar alignment, and a new link formed to the bridleway along the dismantled railway alignment, skirting the proposed wetland margin to Rhaslas Pond. This footpath, in turn, would link westwards with existing footpaths over Gelligaer and Merthyr Urban Common and to Fochriw at the southern end.

- 3.285 Footpaths through the agricultural land on the northern slopes would be provided, some along proposed farm access tracks, with some variations from the alignment of the existing footpaths to provide a more interesting route through fields and woodland with connections to the Rhymney Valley Ridgeway Walk and existing and new public footpaths linking to Rhymney in the east.
- 3.286 Where restored footpaths cross proposed stone walls, they would do so by traditional stone stiles. Footbridges would be provided at stream crossings and kissing-gates or field gates at hedgerow crossings. Signposts and route markers would be provided at strategic points such as junctions of routes. Where there is access to features of particular ecological or cultural heritage interest, information signs would be provided. Suitable locations for seats and picnic areas would be identified in the detailed proposals, which it is anticipated would be submitted as part of the detailed restoration and aftercare design to be approved prior to each stage of the progressive restoration of the site.
- 3.287 In addition to this, in accordance with LDP Policy CW8, ecological management of off-site land at Bryn Caerau Farm to the southwest of the site would be undertaken as compensation for the effects of the scheme on the biodiversity of the area. This would be coupled with the creation of a permissive route looping through it and linking to the existing rights of way network, with potential for registration as a definitive right of way in the future.

Soil handling

- 3.288 The soil handling methodology to be employed in the restoration is based on the detailed assessment of soil resources that has been carried out on the site and the design of the restoration scheme takes that assessment into account. Details of the soils resource, stripping, storage, replacement and handling, are set out in this chapter, and considered in further detail in the 'Agricultural Land Use and Soils' section at Chapter 9 of this Environmental Statement.
- 3.289 The general principles on which it is based are:-
- Recognition of and separate handling of different kinds of topsoils, subsoils and other potential soil forming materials available on site
 - Handling of soils, particularly during the replacement phase, by such machinery and operated in such a way as to reduce the potential for soil damage and compaction
 - Ensuring that all concerned are aware of the objectives and methodology, and that operations are adequately supervised and monitored.
- 3.290 The soil resources available are:
- Clayey with Peaty Surface, found to the south and south-east of Rhaslas Pond;
 - Loamy over Clayey, as a fringe to the east of the main area of the peaty soils;
 - Loamy Shallow, which are restricted in area and the majority are found on the eastern fringe of the site and a small area south of Bryn Pyllog;
 - Restored, located mainly to the north east and north of Rhaslas Pond;

- Restored (Topsoil), in a number of fields along the northern fringe of the site.
- 3.291 Generally, soils would be stripped from areas where they would be disturbed and stored for reuse in the restoration of the site. Topsoils, subsoils and other materials would be stored separately. Topsoil and subsoil storage mounds would be limited to a height of 5m. Peat would be stored in appropriately excavated cells, the above-ground containment bunds of which would be limited to a height of 3m.
- 3.292 The outer faces of all storage mounds and containment bunds would be grassed, weeds controlled and other maintenance carried out as necessary. The seed mixture and the application rates would be agreed with the Mineral Planning Authority in advance. Provision would also be made to control the water-content within the peat storage cells.
- 3.293 The strategy for the replacement of topsoil, subsoil, peat and soil forming material is set out here with further detail provided on methodologies for peaty soils in Appendix MA/NL/ES/09/002 and for non-peaty soils in Appendix MA/NL/ES/09/003 to Chapter 9 of this Environmental Statement.
- 3.294 Generally, peaty soils would be laid over a pre-prepared clayey basal layer, effectively the original clayey subsoil. Non-peaty soils would be generally re-spread over the areas from where they were stripped, but positioned to achieve the proposed restoration design. Suitable soil forming material would be used where there is a deficiency in the original soil resources.
- 3.295 Soil and peat materials would be replaced by dump trucks and spread, as appropriate, by excavator bucket or light tracked bulldozer. This would avoid unnecessary soil compaction, but any significant compaction remaining would be relieved by separate loosening operations. More detail on the appropriate methodologies is provided at Appendices MA/NL/ES/09/002 and MA/NL/ES/09/003 to Chapter 9 of this Environmental Statement.
- 3.296 Soil handling would not take place during extended periods of wet weather.

Establishment of vegetation and pond creation

Seed Mixtures

- 3.297 Appropriate seed mixtures would be specified in the phased restoration schemes for each stage of the progressive restoration of the land, and would accord with the soil types and the proposed after-use of the various areas of the site. The detailed restoration and aftercare proposals would be discussed and agreed with the Welsh Government Agriculture Department and the Mineral Planning Authority. The areas of different vegetation types for which seed mixtures would be provided are shown on Environmental Statement Drawing MA/NL/ES/16/012. All seed mixes and provenances specified would be subject to availability on reasonable commercial rates and terms.
- 3.298 Sources of seed would vary depending on the after-use of the various areas of the site. Seed used in the 'upland grassland' areas on Environmental Statement Drawing MA/NL/ES/16/012 is likely to be normal agricultural cultivars. In the 'wet dwarf shrub heath' and 'wetland/wetland transition' areas, seed would again be of commercial stock but less competitive cultivars would be used. The practicability of use of seed of Welsh provenance in these areas would be investigated and would be used, if available on reasonable commercial terms.

- 3.299 As an alternative to commercial seed, the potential for harvesting seed/litter from undisturbed areas of the site, or adjoining land (for example the Tair Carreg Moor SINC) for use in restoration would be investigated.

Tree and shrub species

- 3.300 The principal areas of tree and shrub planting would be in the lower lying areas in the north and east of the site. There would also be planting of new hedgerows associated with the restored fields in the north of the site. Suitable species and specifications for these plantings, including replacement requirements for failed stock, would be discussed and agreed with the Mineral Planning Authority.
- 3.301 The potential benefits of phased planting, utilising pioneer/nurse species in the first instance to be followed after a few years by canopy species, would be considered. Aftercare schemes would include full details of planting and management proposals.
- 3.302 All tree and hedge plantings would be protected against grazing animals by fencing until the end of the aftercare period.

Pond Creation

- 3.303 A number of ponds would be created as part of the operation and restoration of the site. These would include ponds based on silt lagoons which would be restored to provide wetland habitats, and also ponds provided specifically for the conservation of great crested newts. Proposed locations of these ponds are shown on the restoration plan (Figure MA/NL/ES/16/014). The margins of new ponds would generally be constructed with gradients in the range 1:10 to 1:15 to encourage the development of marginal vegetation and aquatic fauna.

Progressive restoration and land management

- 3.304 The restoration strategy would be implemented progressively as operations proceed, as part of a detailed restoration design that it is anticipated would be submitted at each stage of progressive restoration as a requirement of a planning permission, and would include the following:
- During operations, remediation works would be carried out to the Lapwing area and the Rhymney valley side
 - Ponds would be established in these areas and within margins of the site which are to remain undisturbed
 - Proposed public rights of way would be established in areas outside of operational parts of the site during the operational phase, including the new bridleway along the eastern edge of the site forming the alternative route to most of the Rhymney Valley Ridgeway Walk
 - Other amenities that could be established during operations and those that would be established in later phases include way-marking of access routes, and provision of

seating, picnic areas and information signage explaining both the coal operations and the remediation and restoration proposals

- 3.305 In addition to this, in line with LDP Policies CW4 and 8, a plan is put forward for management of off-site land at Bryn Caerau Farm for ecological enhancement, with the creation of a permissive public access through it.

Post restoration land management

- 3.306 Grazing would be an important component of the post restoration land management and stocking rates are likely to vary according to the use of the various areas of the site, details of which are set out in Chapter 9 of this Environmental Statement.
- 3.307 Stocking rates are normally stated as Livestock Units (LU) per ha and preferred stocking rates on the enclosed fields at the north of the site once established, could be up to 2.25 LU/ha, while on the wet grass heath, the preferred stocking rate would be not more than 0.15 LU/ha. On the upland grassland areas, 0.45-0.75 LU/ha would be likely to be appropriate, allowing for development of improved wildlife habitat.
- 3.308 These issues would be addressed as part of a detailed minimum 5 year Aftercare Management Plan which would be submitted to and agreed with the Mineral Planning Authority.

Future Management of the Common Land

- 3.309 Beyond the aftercare period, the future management of the common land would be the responsibility of the Gelligaer and Merthyr Commoners Association, within the constraints of their entitlement to use the land as commoners. Overgrazing of wet heath areas of the common will be discouraged by the creation of preferable grazing on adjacent land.

Planning Policy Context

- 3.310 MPPW includes as one of the five principles of sustainable development the need to achieve high standards of restoration and beneficial after use (paragraph 10). More detailed advice is set out in Paragraphs 48-54 of MPPW, which, inter alia, requires that land should be restored to a high standard suitable for its agreed after use at its earliest opportunity, and that restoration and aftercare should provide the means to at least maintain, and preferably enhance, the long term quality of land and landscape taken for mineral extraction (paragraph 48). These policy requirements are further articulated in MTAN2, including Appendix Q, which provides advice on best practice for reclamation.
- 3.311 The policy requirements and principles for best practice are reflected in the proposed restoration strategy, which will deliver an attractive restored site, at topographic levels and with land uses which are appropriate to the landscape context, and with enhancements to safety (via the remediation of historic mining); to the landscape (via tree, shrub and hedgerow planting, stone-walling and heritage characterisation in appropriate areas); and to the number of rights of way and permissive paths which would be created (discussed further below).

Remediation of Old Shafts, Adits and Mining Dereliction

Shafts and Adits

- 3.312 The site area has been subjected to extensive underground mining for both coal and ironstone, dating back to before the 18th century. The age of most of these workings indicates that they were associated with the establishment and expansion of large scale iron and steel manufacturing in Dowlais and Rhymney. The iron ore is present as nodules in bands throughout the sequence, particularly between the Garw Seam and the Lower Four Feet Seam. Most of the seams to be worked on site have been subjected to underground mining to varying degrees, but of those, particularly extensive workings exist in the Little Vein, Rhaslas, Big, Black, Upper Four Feet and Two Feet Nine Seams. Old workings also occur sporadically throughout the sequence at the ironstone horizons.
- 3.313 The reserves were initially exploited by 'patchworking; an early form of surface mining. When reserves close to the surface had been largely worked out, deep mining methods were used. As a consequence of these workings, a great many shafts were sunk and adits driven from the surface to reach the reserves. There are 138 known shafts and adits within the Nant Llesg planning application site area, all previously associated with old iron ore and coal mining. The known locations are shown on Planning Application Drawing MA/NL/PA/003.
- 3.314 It is probable that other unrecorded entries exist. Most of the shafts within the site are thought to have been sunk in the early 1800s with some used up to the 1880s and, while most were probably carried out prior to 1850 with some possibly dating back as far as the mid1700s, the recording of mine workings was not made compulsory until 1872. However, this is not to say that nothing prior to that date was recorded, just that records before that date remain uncertain.
- 3.315 The Coal Authority is responsible for holding the Mining Records that depict detail of coal extraction as it was recorded, along with associated mine entries. The applicant has researched these records, along with other historic cartography, and has identified the shafts and adits shown on Planning Application Drawing MA/NL/PA/003.
- 3.316 Historically, there have been several instances of old mine entries on the urban common collapsing without warning. Each time, the Coal Authority has responded by carrying out works to remediate the problem. Examples of these can be found at Appendix MA/NL/PA/A005 to the Planning Statement. However, the occurrence of such sudden failures on urban common land, available for use by the public on foot or horseback for air and exercise, presents particular public safety concerns. It is therefore the applicant's proposal to locate each known shaft and deal with any identified potential hazard before it occurs – hence offering a proactive rather than reactive solution.
- 3.317 A number of the mine entrances lie within the coal working excavation area as shown on Planning Application Drawing MA/NL/PA/003. These would be excavated through during surface mining operations and would therefore not require individual assessment and remediation. On restoration of the land, the coal working excavation area would therefore be free of mine entrances and consequently safe for public use.
- 3.318 The shafts and adits that lie outside the coal working excavation area would need to undergo individual investigation and remediation as necessary.

3.319 As part of the proposed development, Miller Argent would investigate the 138 known shaft and adit locations and other possibly unrecorded abandoned mine entries that may also exist within the area of the site. Once located and investigated, they would establish whether or not there is an identifiable risk associated with the disused mine entry. These investigations and actions would include:

- Investigation of available records of previous works to seal and secure the mine entry, either at the time of abandonment or later, would be investigated;
- The site would be physically investigated to establish the presence and condition of any existing capping, fill or seal;
- Proposals for any necessary remedial works would be drawn up in liaison with the Coal Authority;
- Any necessary physical works to render the mine entrance safe would be carried out by Miller Argent at no cost to the public purse;
- The Coal Authority would be fully advised of Miller Argent's findings and the detail and completion of any remedial works so that the Coal Authority can update their Mining Records.

3.320 All such works within the site boundary but outside the coal working excavation area would be carried out within two years of the commencement of coaling at the Nant Llesg Surface Mine.

Mine Water Discharge

3.321 Allied to the remediation of the surface mining legacy is the opportunity provided by Nant Llesg to improve the polluting mine water outfall to the River Rhymney. The removal of a considerable three-dimensional network of underground old workings within the coal working area of the Nant Llesg mine would remove a significant part of the source of the polluting mine water.

3.322 The direction of groundwater flow beneath the planning application site is understood from site investigations to be generally eastward and largely controlled by subterranean features of the Dowlais Free Drainage System, which drains groundwater towards the River Rhymney catchment via the Big Coal and Rhas Las Drains. This, in turn, discharges into the underground 'Bute Watercourse' which runs parallel to the River Rhymney for approximately 2 km, collecting water from other drainage adits before flowing into the River Rhymney via a culvert which runs under the town.

3.323 The Environment Agency has assessed the mine water outfall from the culvert, referred to as the 'Pontlottyn' mine water discharge, as the second worst impacting coal mine water discharge in Wales, that has not yet been remediated. The Coal Authority, having carried out their own investigations into the problem, considers that, at the present time, remediation is probably infeasible, mainly due to health and safety concerns of entering the river culvert to capture and transfer the water.

3.324 While the development is carried out the Dowlais Free Drainage System, which carries much of the discharge, will be interrupted within the void and the water will be run through water treatment areas, with significant improvements in water quality. In the longer term, by mining through and

removing a significant section of the old coal and ironstone working that give rise to the water quality problem, Nant Llesg provides a unique opportunity to help improve the quality of the mine water currently discharging into the River Rhymney at no cost to the public purse.

Planning Policy Context

- 3.325 In planning policy terms, this element of the development would deliver important health and safety enhancements over a considerable area of urban common land, involving the treatment of 138 know shafts and adits associated with previous iron ore and coal working.
- 3.326 This legacy of historic mining is highlighted in MTAN2 paragraph 245, which notes that remedial action may be required to protect public safety, either as emergency action following the collapse of a mine entry, or to prevent such a situation arising. The circumstances at Nant Llesg are particularly important in areas where members of the public have unfettered access to the common land.
- 3.327 The works proposed are therefore considered to represent a considerable “local/community benefit” (see MPPW paragraph 62), with the majority of the works appropriately taking place within areas that are “within 500m of a settlement” as they are not coal working or are “exceptional” measures (see MTAN2 paragraph 49).

Land Remediation Works to address silting of Darran Valley Country Park Lake

- 3.328 Following the closure of the Ogilvie Coal Mine, the site, which lies just north of Deri in the County Borough of Caerphilly, was developed into a community facility known as the ‘Darran Valley Country Park’. The park was developed in the 1980s to form a Country Park centred on a large man-made lake; the ‘Ogilvie Lake’.
- 3.329 The lake is fed from the north by a watercourse known as the ‘Nant Bargod Rhymni’. Since it was formed, the lake has had a recurring problem with silt building up in its northern area, where the Nant Bargod Rhymni enters the water body. An investigation carried out by Hyder and commissioned by Caerphilly County Borough Council, has identified that the deposited material originates mostly from spoil tips north of Fochriw and that, if the lake is to be prevented from being lost completely, control measures and maintenance must be implemented.
- 3.330 It is understood that the last time the lake was de-silted was in 2007 at a cost of some £120,000, and it presently requires de-silting again, with the costs, although currently unquantified, likely to be of a similar order.
- 3.331 Various options for dealing with the problem have been considered but, without addressing the source of the problem, they are limited to schemes to arrest the silt before it enters the lake and periodic removal of deposits. Such operations have already proven to be costly to the public purse, and estimates for the treatment of the spoil tips to eradicate the problem of surface water runoff scouring silt into the stream from the steep-sided slopes, have proven to be cost-prohibitive. In the meantime, a very valuable and costly public amenity continues to be threatened.
- 3.332 Having become aware of the problem and solution difficulties, Miller Argent have drawn up a scheme of remediation works to include an appropriate surface drainage scheme to better

control the flow of surface water from the expansive area of old colliery tip material north of Fochriw into the Nant Bargod Rhymni. Although not required for the Nant Llesg scheme, the works would be carried out at no cost to the public purse as an early community benefit. Details of the proposed drainage works can be found at Appendix MA/NL/PA/A008 to the Planning Statement.

- 3.333 By carrying out the works, Miller Argent aims to assist the Local Authority in maintaining the high quality public amenity at Darran Valley Country Park. It is hoped that, as a benefit of the works, the Local Authority would have to spend considerably less money repeatedly removing silt from the lake, so that funds can be directed to more beneficial purposes.

Planning Policy Context

- 3.334 In policy terms, the importance of Parc Cwm Darran is highlighted in the Caerphilly LDP (November 2012) as one of three Country Parks which contribute to the Valleys Regional Park, and which are tourist attractions in their own right (see policy LE3). The proposed works to address surface water runoff from historic colliery tips, and associated siltation/management problems in the Country Park will assist the aesthetic quality and appearance of the lake within the Park, and reduce the management liability to the Local Authority, as a further local/community benefit associated with the scheme (see MPPW paragraph 62 and MTAN2 paragraph 45).

Road Improvement Works

- 3.335 All coal from the Nant Llesg Surface Mine would be transported to Cwmbargoed Disposal Point by road. Miller Argent has discussed with the Local Highway Authority the likely impact the proposals might have on the local road network, and an environmental assessment of the likely effects on traffic and transport has been undertaken. The findings can be found at Chapter 7: 'Traffic & Transport' of this Environmental Statement.
- 3.336 Although not a requirement of the Highway Authority, Miller Argent proposes to carry out certain improvement works to the road junction between Fochriw Road and the Bogey Road to improve visibility for traffic using the junction. Adjustment would be made to the vertical alignment of Fochriw Road running south from the junction, and would involve reducing the level of the crest there by approximately 1.3 metres. This would increase southward visibility from the Bogey Road / Fochriw Road junction to 160m from the current 70m. Together with better signage and additional road markings, the improvements are aimed at improving safety at the junction.
- 3.337 The proposed works are included within this planning application site area as indicated on Planning Application Drawing MA/NL/PA/003, and would be carried out over a period of approximately 4 to 6 weeks and completed prior to the commencement of coal haulage from the Nant Llesg Surface Mine to Cwmbargoed Disposal Point.
- 3.338 While the works are carried out, traffic would be diverted onto a temporary route to be constructed immediately east and adjacent to the highway. All necessary temporary road signage would be provided in agreement with the Local Highway Authority.
- 3.339 As the roads cross the urban common, the land upon which the road improvements are to be carried out, and that where the temporary diversion would be constructed is urban common land. The proposals therefore form part of the works to be carried out on the common that are

- being put forward to the Welsh Government Ministers for consent under Section 38 of the Commons Act 2006. However, the final carriageway will not exceed the boundaries of the existing carriageway.
- 3.340 Detail of the proposed road improvement works are set out on Planning Application Drawings MA/NL/PA/024 to MA/NL/PA/026.
- 3.341 The vertical re-alignment works would be carried out along a length of approximately 150 metres of Fochriw Road immediately south of its junction with the Bogey Road. The length of the highway involved is shown on Planning Application Drawing MA/NL/PA/024 and cross-sections through the proposed works are shown on MA/NL/PA/025. The reduction in road level by up to approximately 1.3 metres at the existing crest would involve the re-aligned highway being put in a small cutting for a length of approximately 95 metres.
- 3.342 As shown on Planning Application Drawing MA/NL/PA/024, the works would provide a greatly enhanced visibility splay at the junction.
- 3.343 The layout of the proposed temporary diversion is shown on Planning Application Drawing MA/NL/PA/021. The length of the diversion would be approximately 250 metres and, as can be seen from the drawing, the layout of the junction would be temporarily remodelled.
- 3.344 On completion of the works, the temporary road diversion would be removed and the land restored as common grazing land. Once restored, the land would be subject to a minimum five-year period of aftercare.
- 3.345 Additional minor improvement works would be carried to the junctions at Access Points 'B' and 'C' to Cwmbargoed Disposal Point. These would reconfigure the radius kerbs to deter coal lorry traffic from turning left onto the Bogey Road. Road signage would also be put in place at the entrance gates to these junctions to advise coal lorry drivers to turn right only onto the Bogey Road. The improvement works would be carried out and the signage erected as part of the site establishment works, and would be completed before the commencement of coal haulage to the disposal point from the Nant Llesg Surface Mine. The layout of the proposed works and signage proposed for Access Points 'B' and 'C' can be seen on Planning Application Drawing MA/NL/PA/027.
- 3.346 In the process of carrying out the above road improvement works, toad crossings would be provided across both the Fochriw Road and the South Tunnel Road at the locations indicated on Planning Application Drawing MA/NL/PA/003. This would involve the installation of ACO AT500 wildlife tunnels (or similar suitable approved alternative) installed flush with the road surface. Further information about the need for these crossings is provided at Chapter 8: Ecology and Nature Conservation below. The detailed design of the crossings would be agreed with CCBC.

Planning Policy Context

- 3.347 As noted above, the proposed improvements to Fochriw Road to improve forward visibility is not an express requirement of the Highways Authority, but it is a measure which would enhance road safety. The proposal is thus consistent with the general advice in MPPW regarding the need for the road network to deal safely with the movement of minerals (paragraph 43), and the Caerphilly LDP which sets out general requirements relating to safely and effectively accommodating development traffic through appropriate design (policy CW3).

Works Associated with Rhaslas Pond

- 3.348 Rhaslas Pond is one of a number of man-made reservoirs associated with the Dowlais Free Drainage System (DFDS). These provided water to the Dowlais Iron Works on the north-eastern side of Merthyr Tydfil via a three-dimensional system of over-ground leats and underground channels set within the ironstone and coal mines.
- 3.349 Rhaslas Pond is one of the larger reservoirs in the system, though, since it is sited towards a high point on Gelligaer & Merthyr Common, it does not enjoy a large catchment area. The pond is located astride a ridge and was formed by the construction of two very large dams across minor natural drainage routes to north and south of the ridge. It has therefore been speculated that the pond might have originally been used for scouring of iron ore down-slope of the pond. However, this has not been confirmed and the pond is treated as being associated with the DFDS.
- 3.350 The banks of the pond are formed of compacted earth, with a clay core and dressed dry-stone masonry armouring. Miller Argent currently maintains and uses the pond as an operational reservoir. The southern dam is well preserved, but the condition of the northern dam reflects a history of greater disturbance and repair over the years.
- 3.351 Miller Argent recognises Rhaslas Pond as being of high cultural heritage value, even though it is an operational reservoir and has always remained so.
- 3.352 The southern embankment emerges as the most interesting and better preserved of the two and, in recognition of this, Cadw has indicated an intention to schedule the southern embankment under the Ancient Monuments and Archaeological Areas Act 1979. For the same reasons, Miller Argent had appropriately protected the southern embankment within the site design for the Nant Llesg Surface Mine.
- 3.353 The southern embankment would be preserved in-situ throughout surface mining operations. If formally scheduled, any works that might affect the monument will require Schedule Monument Consent.
- 3.354 The southern half of the reservoir along with the better preserved southern embankment would be retained. The southern embankment would be retained in-situ during the implementation of the scheme and, in liaison with Cadw, appropriate measures would be put in place for its protection during mining operations. Throughout site operations, to prevent the southern embankment drying out and its integrity being threatened, the water in the pond would be generally retained within the range of water levels that currently subsist.
- 3.355 The northern embankment lies within the south western sector of the coal working excavation area. It would be necessary to remove the northern embankment ahead of the commencement of mining operations in that area. (See Planning Application Drawing MA/NL/PA/003).
- 3.356 The northern embankment and pond would be fully investigated archaeologically before being removed and the materials stored on-site for use in the restoration design for this part of the site.
- 3.357 Before the northern embankment is removed, a barrier would be constructed across the centre of Rhaslas Pond in an east-west direction to separate the northern and southern areas of the pond. The northern part would then be drained and in-filled to form a plateau in preparation for the construction of the workshops, barrel washing plant and coal stocking area as shown on

- Planning Application Drawing MA/NL/PA/003. During this operation, the water level in the southern sector would be retained within its usual range.
- 3.358 The outfall from the reservoir is presently at its north-eastern corner and a north-eastern outfall would be retained in the reconfigured pond during surface mining operations. This would discharge northwards into the void under extreme rainfall events. A further outfall would be provided in the south-western corner, which would act as the primary outfall and permit discharge southwards to Water Treatment Area WTA4 before discharging southwards into the Nant Bargod Rhymni. A hydro-brake would be installed at this location to control the rate of discharge.
- 3.359 The principle of carrying out such works has been favourably received by Cadw and, in the event of the southern embankment being scheduled as a monument, detailed proposals would need to be submitted for Cadw's approval as part of an application for Scheduled Monument Consent. Rhaslas Pond would continue to be regulated as a reservoir under the Reservoirs Act 1975 for the duration of site operations.
- 3.360 On completion of mining operations, the southern embankment would be incorporated within the restored landscape as depicted on the Restoration Strategy Drawing MA/NL/PA/009 and would form part of the restored reservoir, 'Rhaslas Pond'. The restored landform would be such that the restored pond would reduce in depth towards the north where it would dissipate into a wetland area as shown on Planning Application Drawing MA/NL/PA/009 (Environmental Statement Drawing MA/NL/ES/016/012-2).
- 3.361 The northern embankment would not be reinstated as a feature of the reservoir, but would be commemorated in the landscaped to the north of the wetland as part of the micro-topography, with materials from the original stone armouring being used to depict its original outline. A low earth bank would be formed on the alignment of the northern embankment with a footpath across it. It would be faced or otherwise marked with the recovered stones from the stone armouring. The northern outfall would also be reinstated as a leat with a culvert through the restored bank, to be stone lined in similar style to other Dowlais Free Drainage System features. The northern half of the Pond would be shallowly graded so that wetland and reed beds can be established.
- 3.362 The environmental impact assessment of the proposed works associated with Rhaslas Pond can be found in Chapter 15 (Cultural Heritage) of this Environmental Statement.

Planning Policy Context

- 3.363 In Policy terms, MPPW highlights the importance of preserving historic buildings, ancient monuments and their settings when determining applications for mineral extraction (paragraph 31). PPW further highlights the need to preserve archaeological remains scheduled as being of national importance, albeit recognising that not all nationally important remains meriting preservation will necessarily be scheduled (paragraph 6.4.2).
- 3.364 In this case, the importance of Rhaslas Pond has been recognised, and the key feature of interest, the southern embankment, would be preserved as part of the development scheme.
- 3.365 It is recognised that there would be a temporary effect on the setting of Rhaslas Pond during the development, but the restoration strategy makes provision for the reintegration of Rhaslas Pond into the restored topography, within a landscape setting which is reflective of current

circumstances. There would be thus no long term adverse effect on the setting of Rhaslas Pond and its key feature of interest.

Coal Washing Plant and Ancillary Water Recycling Facility

Introduction

- 3.366 As identified in the Need Case set out at Chapter 15 of the Planning Statement, the provision of coal to a specification suitable for the identified markets requires a sophisticated coal washing plant that is capable of significantly reducing the inherent ash content in the 'run of mine' coals delivered to Cwmbargoed Disposal Point. 'Run of mine' coal is coal exactly as it leaves the mine prior to any preparation or blending.
- 3.367 Miller Argent has considered a range of plant options and has determined that the most suitable option is a 'Dense Medium Coal Washing Plant', which offers the smallest footprint and requires the least amount of ancillary equipment, but provides the necessary capability of processing up to 400 tonnes per hour. The principal component of such plant is a 'dense medium' cyclone, which has no moving parts and therefore offers a quieter plant producing lower noise levels at source.
- 3.368 The proposed plant employs a closed water system, whereby water used during the process is recycled. However, due to the plant being required to handle the throughput from both the Ffos-y-fran and the Nant Llesg mines, the amount of water that would adhere to the materials being processed becomes appreciable. Additional water storage capacity would therefore be needed at the disposal point. Having considered possible options, it is considered that the most sustainable option would be the provision of a new water recycling facility, suitably located to store water gathered from surface water run-off within the disposal point during periods of rainfall. It would take the form of a lagoon-type structure, within which surface water run-off from the disposal point would be stored. Water recycled through the facility would replenish the water lost during the coal washing process.

Coal Washing Plant

- 3.369 A separate planning application for the erection and operation of an additional coal washing plant at the CDP was submitted on 25th March 2013, but has not yet been determined. Notwithstanding this separate application, the Nant Llesg application includes the same washing plant as part of the overall Nant Llesg scheme in association with the existing production facilities on-site to allow changing markets to be fully serviced by coals originating from both the Ffos-y-fran and Nant Llesg surface mines.
- 3.370 The planning application therefore includes a proposal for a washing plant to be located within Cwmbargoed Disposal Point (CDP) with a capacity to process 400 tonnes of coal per hour, enclosed in a building approximately 43m wide x 48m long and 20m high, together with associated conveying systems. The advantage of this solution is that the washing plant will be contained within a single building, thus minimizing dust and noise emissions. The plant would be erected within Cwmbargoed Disposal Point at the location shown on the 'Proposed Site Layout' Drawing MA/NL/PA/010.

- 3.371 In terms of capacity, the new facility would have the ability to increase the production of washed coal by up to 400 tonnes per hour, giving a total capacity of production in tandem with the existing coal wash of up to 1.1m tonnes per year. This constitutes around 60% of the planned total output of the CDP, with the remainder being processed by the existing dry crushing and screening plant. The layout of the washing plant within the new building and cross sections through it can be found at Planning Application Drawings MA/NL/PA/016, MA/NL/PA/017 and MA/NL/PA/018.
- 3.372 The layout and external elevations of the proposed washery buildings is shown on Planning Application Drawings MA/NL/PA/019, MA/NL/PA/020 and MA/NL/PA/021.
- 3.373 The new coal wash facility would include the following key elements:
- Run of Mine (ROM) Handling;
 - Washing and Processing Plant;
 - Water Recycling.
- 3.374 Further details of the proposed plant are provided below, and should be read in conjunction with Planning Application Drawings MA/NL/PA/016, MA/NL/PA/017 and MA/NL/PA/018. A Design and Access Statement has been submitted with the planning application which explains the design principles and concepts applied to the proposed development and how issues affecting access have been taken into account.

Run of Mine (ROM) Handling

- 3.375 ROM coal delivered to Cwmbargoed Disposal Point would be stocked adjacent to the proposed washing plant in an area that is currently used for similar stocking purposes.
- 3.376 The building housing the feed hopper would be 9m x 8m x 9.5m high, and the cladding would be coloured to match the main building. The building would be open on its north-east aspect to allow access for a front end loading shovel (FEL).
- 3.377 The ROM coals would be stockpiled according to individual seam quality by FEL. As in the existing blending operation, the coal stockpiles would be pre-blended by FELs to achieve the required quality for feeding the existing plant and the proposed wash plant.
- 3.378 The pre-blended ROM coal would be fed by FEL into a surface mounted hopper over a 'Pan Breaker' that would reduce the coal size to below 150mm. Water sprays would be mounted above the surface mounted hopper, which would, together with the building enclosure, suppress dust emissions.
- 3.379 The coal would be conveyed by a covered conveyor into a crushing plant consisting of a 'Twin Roll Sizer' housed in a metal clad steel framed building (11m x 10m x 8.5m), which would reduce the maximum particle size to below 75mm.
- 3.380 The less than 75mm coal would then be conveyed by a covered conveyor to the washing plant in the main building.

Washing and Processing Plant

- 3.381 The main building housing the washing plant would measure approximately 43m wide x 48m long x 20m high together with associated covered conveying systems. The roof cladding would be corrugated to match existing materials, and the side cladding would be 1000/S2 box profile. The cladding would be coloured in a pattern of Olive Green, RAL 6021, on the lower parts of the building elevations and Brown, RAL 7034 on the upper parts. The aim of the colouring is to give the impression of a cluster of smaller built forms that break up its appearance in views to a similar visual texture to the rest of the CDP. The proposed architectural treatment of the elevations is illustrated on Planning Application Drawings MA/NL/PA/020 and MA/NL/PA/021, and in artist's impression is depicted on Planning Application Drawing MA/NL/PA/022.
- 3.382 Coal that has been crushed and/or screened to a size less than 75mm would be conveyed into the main building of the proposed washing plant via an inclined covered conveyor which would feed a 'Binder/Bivotec' screening module within the main building. Coal greater than 50mm would pass over a screen into a single roll crusher and be reduced to less than 50mm and recirculated back onto the screen. The coal smaller than 50mm from this screening process would be conveyed within the building onto a further wet screening process which would separate coal that is over 1mm from smaller coal.
- 3.383 Coal over 1mm in size would be fed into a tank and pumped into the Dense Medium (DM) Cyclone, which would be the main coal cleaning process within the plant. The medium used for separation in this process would be a suspension of water and an inert ferrous material called 'Magnetite', which would be recovered magnetically in the process and re-used. The DM Cyclone separates coal from shale and stone and the cleaned coal passes through a centrifuge which would recover adhering water for re-use in the process before being conveyed by covered conveyor out of the main building across the blending yard and onto the existing covered inclined conveyors that take the coal to the existing train despatch areas. The removal of the stone and shales by washing the coal would result in lower 'ash content' that would meet the specification sought by the market. The by-product of stone, shale and coaly material from the DM Cyclone would pass over a screen to separate and re-cycle the media and water before it is conveyed out of the main building and onto a stockpile for transfer by returning coal lorries for blending with run-of-mine coals supplied to the on-site barrel washing facilities.
- 3.384 The finest coal (less than 1mm) would be processed through a spiral, froth floatation, filtration and water clarification system with the cleaned coal from this process joining the other coal from the DM cyclone. An alternative link enables this material to be conveyed to ground. The stone, shale and coaly material from this process would join that from the DM cyclone and be conveyed to the stockpile as above.
- 3.385 The whole process is designed as a closed circuit to recycle and recover the water and magnetite used.
- 3.386 All external conveyors, shown on MA/NL/PA/019, would be covered; transfer chutes would be enclosed and fitted with dust suppression sprays.

Water Recycling Facility

- 3.387 The separate free standing planning application for the coal washing plant is based upon the use of the plant to process coal from the FLRS. In order to accommodate the increased

- throughput which would be associated with coal from the Ffos-y-fran and Nant Llesg mines, an additional water recycling facility will be required.
- 3.388 The purpose of the facility is to provide the anticipated capacity of water that is likely to be needed to operate the new coal washing plant at full production through periods of dry weather. In periods of wet weather, the facility would be replenished by surface water run-off from the disposal point.
- 3.389 Water would be recycled wherever possible and surface water run-off utilised in preference to using mains water; the latter being used as a last resort.
- 3.390 Water used within the plant would be recycled as part of the Dense Medium washing process. However, some water inevitably adheres to the washed coal, silt and stone and would partly drain away from the product and discard stocking areas into the existing disposal point surface water drainage system.
- 3.391 Water from the stocking areas and other parts of the disposal point naturally gravitates via a well-established system of open gullies and culverts towards the water treatment facilities at the lowest part of the disposal point. In order to collect additional quantities of this water for recycling, the proposed water recycling facility would be located in the same low-lying area; away from the proposed new washing plant. It would be constructed on land to the south-west of the disposal point at the location shown on Planning Application Drawings MA/NL/PA/003. The facility would lie on the south-western side of the private railway siding and consist primarily of a water storage lagoon with pumping facilities. Detail of the proposed layout for the facility is provided on Planning Application Drawing MA/NL/PA/023.
- 3.392 The facility would provide an additional capacity of approximately 8,000 m³ of water. Water would be collected by the existing disposal point surface water drainage system and, when there is surplus water within those lagoons, it would be pumped via a pipe under the railway embankment into the water recycling lagoon. The water would be stored for use during prolonged dry spells, when it would be pumped back into the Disposal Point lagoons from where it would be further pumped via an existing system of pipes to the coal processing and washing plants. An extension to this system would supply the new coal washing plant.
- 3.393 The water recycling facility has been designed with 1m freeboard, being the minimum difference in level between the designed water level and the lowest point along the top of the containing embankments. It would employ a float switch to automatically maintain water at the designed level by pumping surplus water back to the existing disposal point lagoon system during periods of high rainfall. The contingency capacity provided by the freeboard is sufficient to absorb unexpected storm events or temporary shortfalls in pumping capacity.
- 3.394 Environmental assessments have been carried out in respect of the various development proposals within the Nant Llesg scheme, including those of the proposed new coal washing plant and the water recycling facility. Cumulative effects have also been assessed. Details of the related assessments for dust, noise and visual impact can be found within the relevant chapters of this environmental statement.

Planning Policy Context

- 3.395 The purpose of the washing plant is to enhance the coal product range, and ensure that the coal products meet the high specification requirements of the main end users (RWE at Aberthaw Power Station and Tata Steel at Port Talbot Steelworks).

- 3.396 MPPW emphasises the importance attached to the efficient use of minerals and the appropriate use of high quality materials (paragraph 55). This objective forms a key component of sustainable minerals extraction as set out in MPPW (paragraph 10), and repeated in MTAN2 (paragraph 8). It also forms one of the sustainable objectives for the planning system set out in PPW (paragraph 4.4.3) which similarly notes that where it is judged necessary to use non-renewable resources “*they should be used as efficiently as possible*”.
- 3.397 The additional coal washing plant would be fully consistent with this policy objective.

Continued Use of Cwmbargoed Disposal Point Facilities

- 3.398 The Cwmbargoed Disposal Point (CDP) has been processing and preparing coal for over 55 years. The first planning permission for the facility was granted in 1957, although it is suspected that surface mined coals might have been dispatched from the location prior to that. The site has therefore catered for coal produced from a number of mines within the South Wales area over the years and now has a well-established use. Historically, the CDP has supplied the power generating industry, principally Aberthaw Power Station, and other industrial and domestic customers such as TATA Steel and Lafarge. In doing so, historically it has handled up to 1.5 million tonnes of coal per annum, but, with the addition of the new coal washing plant, it will be capable of handling up to 1.75 million tonnes per annum. The principal methods of processing and preparation over the years have been by fixed blending, crushing and screening plant, supplemented as necessary by mobile plant for screening and/or washing coal.
- 3.399 The facilities at Cwmbargoed Disposal Point (CDP) have been developed under a series of planning permissions dating back to 1957 and currently operate under the following planning permissions:

Permission	Application	Description	Approved	Expires
Caerphilly 08/0231/FULL	08/04/2008	Continue the use of Cwmbargoed Disposal Point with the provision of additional facilities for the duration of related operations at the Ffos-y-Fran Land Reclamation Scheme at Cwmbargoed Disposal Point.	19/06/2008	31/12/2024
Merthyr Tydfil P/08/0091	25/02/2008	Continuation of use of Cwmbargoed Disposal Point for the duration of related operations at the Ffos-y-fran Land Reclamation Scheme and the provision of additional facilities (mineral processing and preparation plant, coal washing plant, coal haulage vehicle workshop, water storage	03/09/2008	31/12/2024

Permission	Application	Description	Approved	Expires
		tank, information and advertising hoardings, coal stacking and preparation facilities and other ancillary works)(Full)		

- 3.400 All development land within the CDP that would be associated with the Nant Llesg Scheme lies within the County Borough of Caerphilly. There is no development proposed within the County Borough of Merthyr Tydfil.
- 3.401 The proposed layout of the disposal point following the erection of the new washing plant, as described in this chapter, is shown on Planning Application Drawing MA/NL/PA/015.
- 3.402 The current planning permission for the disposal point expires on 31st December 2024, coincident with the timing for the FLRS surface mine. It is anticipated that coaling on Nant Llesg would be completed by this time, subject to the commencement of coaling at Nant Llesg in 2014. However, if coaling is not able to be commenced at Nant Llesg by this time then there will likely be a requirement to extend the life of the part of the CDP contained within the Nant Llesg planning application beyond the life of both FLRS and the current CDP permissions, with the remainder of the CDP falling beyond the Nant Llesg application boundary being restored in accordance with the current CDP permission.
- 3.403 To achieve this it would be necessary to provide alternative water treatment facilities within the planning application site area to replace those that currently lie outside the Nant Llesg planning application area, which will be restored in accordance with the current CDP permission.
- 3.404 The proposed layout for the water treatment facilities at the CDP following 31st December 2024 is shown on Planning Application Drawing MA/NL/PA/044. The layout utilizes the water recycling facility referred to earlier in this chapter, which will be used to replace the water storage area, which would be lost during the restoration of the CDP.
- 3.405 The proposed restoration strategy for the areas of the CDP that lie within the County Borough of Merthyr Tydfil, as depicted on Planning Application Drawing MA/NL/PA/044, would be subject to the approval of MTCBC at the appropriate time.
- 3.406 The new layout of the water treatment facilities has been designed to incorporate the necessary settlement, attenuation and 'polishing' facilities to replace those existing at present. A new water treatment building would be constructed, which would house the automated dosing facilities and provide storage for water treatment products. The water treatment facilities would be supplemented by the proposed 8,000 m³ water recycling facility referred to earlier in this chapter. Water would be pumped to and from the recycling facility as described above. Water treated to meet the requirements of the discharge consent would be discharged southwards then south-westwards into the Nant Gyrawd via the restored land to the south.
- 3.407 Planning permission is therefore sought for the addition of the water treatment facility to the CDP for the duration of the Nant Llesg project as well as the revised CDP layout and continued use of the parts of the CDP included within the planning application following the cessation of coaling operations on the Ffos-y-fran Land Reclamation Scheme beyond 31st December 2024, for the lifetime of the Nant Llesg project, if required.

Standalone Planning Application for Coal Washing Plant

- 3.408 A standalone planning application for the coal washing plant was submitted to the local planning authority on 26th March 2013, with the intention of providing for the processing of Ffos-y-fran Coals. If, however, the stand alone application is determined favourably before the Nant Llesg application, then permission for the built development elements of the washing plant as part of the Nant Llesg proposals would not be required.
- 3.409 Nevertheless, in the event that planning permission for the stand alone application is granted, the increased tonnage of coal to be processed through the washing plant would significantly increase if the Nant Llesg Surface Mine proceeds. The use of the plant would intensify and would need to be operational for longer periods during the current permitted hours of operation; slight rearrangement of the coal stocking areas would be needed; and an additional water recycling facility would be required to supplement on-site water resources during periods of dry weather. Consequently, the boundary of the planning application for the Nant Llesg Surface Mine has been extended to include the relevant area of the existing disposal point so as to ensure that the amendments to the disposal point described above and the continued use of the disposal point beyond 31st December 2024, if required, benefit from planning permission.

Continuation of Uses at Cwmbargoed Disposal Point

- 3.410 The current planning permission for Cwmbargoed Disposal Point includes the following uses within the County Borough of Caerphilly, which would need to continue until the completion of washing and processing of coals from the Ffos-y-fran and Nant Llesg mines:
- Continuation of use of all existing mineral processing and preparation plant;
 - Continuation of use of the coal haulage vehicle maintenance workshop;
 - Continuation of use of the dust suppression water storage tank;
 - Continuation of use of the existing coal washing plant;
 - Continuation of use of the water treatment facilities within the planning application site area until such time as a new layout of water treatment facilities is provided within the planning application site area for use from the cessation of coaling operations on FLRS or in any event from 31st December 2024 for the remaining period of coal processing operations for coal from Nant Llesg at the CDP;
 - Continuation of use of all facilities provided as ancillary facilities to the Ffos-y-fran Land Reclamation Scheme, being an office and welfare block; a visitor/training centre; car parking, tree planting and drainage facilities; a gatehouse and associated security facilities: it being proposed that such facilities be used in the future to service the Nant Llesg Surface Mine;
 - The retention of all information hoardings and signage currently erected at the entrances to the disposal point;
 - Changes to the layout and the continued use of all coal stocking and preparation facilities;

- Continuation of all other uses of Cwmbargoed Disposal Point and its existing facilities as a mineral processing, preparation and distribution facility, as permitted by the extant planning permissions;
- Other minor operations and facilities ancillary to the above.

3.411 The facilities mentioned above are identified on Planning Application Drawing MA/NL/PA/015.

3.412 The initial fixed plant at the disposal point operated from 1958 until 1989 and was replaced with plant employing more modern processing and preparation techniques during a major refurbishment of the Disposal Point in 1991. That refurbishment provided what was then a new dry coal screening, crushing and blending plant, but also included new access roads, weighbridges, water treatment facilities, drainage, offices and a laboratory.

3.413 Parts of this plant were dismantled in 1999 by British Coal and processing and preparation activities thereafter continued using mobile equipment. Following this, the site operated intermittently on a much reduced capacity handling coal and other aggregates and was principally kept on a care and maintenance programme awaiting the satisfactory resolution of land entry and planning issues to permit the final phase of the East Merthyr Reclamation Scheme to proceed.

3.414 Following the grant of planning permission for the Ffos-y-fran Land Reclamation Scheme, Miller Argent carried out further refurbishment works to the coal processing and preparation plant; installed the existing Coal Haulage Vehicle Maintenance Workshop; an additional water storage tank; a coal washing plant, additional office and welfare facilities; a visitor/training centre; car parking, tree planting and drainage facilities; a gatehouse and associated security facilities.

3.415 This application therefore concerns itself with the necessity of securing planning permission within Caerphilly's administrative area for the continuation of currently permitted operations, uses and facilities at the disposal point in relation to and for the purposes of preparing, processing and dispatching coals from both the Ffos-y-fran Land Reclamation Scheme and the Nant Llesg Surface Mine for the duration of their combined coal winning operations.

3.416 Included in the above would be:

- The development of the new 400 tonnes per hours coal washing plant at the disposal point and its use for processing coals from both the Ffos-y-fran and the Nant Llesg mines, as referred to above;

3.417 The extension of the use of the Visitor and Education Centre at the disposal point to accommodate:

- the arrangement of visits by parties or individuals who have an interest in activities on both mines;
- information about heritage and ecological finds and activities on both mines for the information of visitors;
- information derived from both mines about the Dowlais Free Drainage System, the Tair Carreg Moor Site of Importance for Nature Conservation, and the Cefn Gelligaer West of Deri Site of Importance for Nature Conservation;

- information about the ecological management of land south of Bryn Caerau Farmstead in the Cwm Golau valley; and
 - information about the progress and on-going proposals for the Ffos-y-fran Land Reclamation Scheme, the Nant Llesg Surface Mine and the incorporated land remediation works.
- 3.418 All coal from the Ffos-y-fran Land Reclamation Scheme would continue to be delivered to the disposal point via the Bogey Road crossing point at Access Point 'X' on Planning Application Drawing MA/NL/PA/003 and would be prepared, processed and dispatched at the disposal point in accordance with extant planning permissions. There is no intention to vary the planning permission for the Ffos-y-fran Land Reclamation Scheme.
- 3.419 All coal from the Nant Llesg surface mine would be delivered to the disposal point by road, leaving the Nant Llesg mine at access point 'A' on Planning Application Drawing MA/NL/PA/003, travelling southwards along Fochriw Road, turning right onto the Bogey Road and entering the disposal point at access point 'B' on the plan. Lorries returning to the mine would leave the disposal point at access point 'C', turning right onto the Bogey Road and returning to the mine via the same route. All Nant Llesg coals would be prepared and processed at the disposal point using the existing facilities along with the new coal washing plant before being dispatched to market. There would be no change from the current general coal handling operations at the disposal point. Once at the disposal point, coals from both mines would enter the same feed stocks to become available for processing and blending to meet temporal market demands. As currently occurs, the vast majority of consignments of coal won from both surface mines would be dispatched by rail with a limited tonnage of up to 50,000 tonnes of coal per annum being dispatched from the disposal point to alternative markets by road. There would be no increase in this currently permitted limitation on road-borne dispatches.
- 3.420 There is no change proposed to the current schemes and controls in place at the disposal point for governing: the cleanliness of vehicles, highways and internal access routes; the weighing and sheeting of coal lorries leaving the disposal point; the height of coal stocks; foul and surface water drainage; car parking and landscaping within the disposal point; and hours of operation.
- 3.421 No new development, activity or use is proposed in those areas of the disposal point that lie outside the planning application site boundary and within the administrative area of Merthyr Tydfil County Borough Council. The use of the facilities within those areas would continue under the extant planning permissions granted by MTCBC. Such permissions expire on 31st December 2024, prior to which a new layout to the water treatment area is proposed to be constructed within the planning application site area, which would be used from expiry of the existing permissions, if required.
- 3.422 Further detail of the market demand and need for the Nant Llesg coal can be found at Chapter 15 of the Planning Statement. The environmental effects of delivering, preparing, processing and dispatching coals from the Nant Llesg scheme, together with the cumulative effects of processing both Nant Llesg and Ffos-y-fran coals, can be found in the following chapters of this environmental statement.

Planning Policy Context

- 3.423 The CDP performs an important sustainability function in allowing coal products to be processed and then transported to their defined markets by rail. This is fully consistent with the policy encouragement to the movement of freight by rail rather than road, as set out in MPPW (paragraph 42), endorsed by MTAN2 (paragraph 197), and reiterated in PPW (paragraph 8.5.3).
- 3.424 This issue is reflected at a local level in the Caerphilly LDP where the CDP is identified in Policy MW1 as a railhead site suitable for minerals handling and despatch, and “*satisfying the sustainability principles of the Plan*” (paragraph 3.26).
- 3.425 The continued use of the CDP in conjunction with the Nant Llesg development is thus fully in accordance with national and local planning policy relating to rail movements, and the acknowledged specific benefits of the Cwmbargoed Disposal Point.

Public Rights of Way

- 3.426 Before the proposed development can proceed, it would be necessary to stop-up the network of public rights of way that cross the planning application site. The existing network is shown on Planning Application Drawing MA/NL/PA/037 and an application is being made to Caerphilly County Borough Council under Section 257 of the Town and Country Planning Act 1990 (“the Act”) to stop-up those routes within the proposed development area.
- 3.427 At the end of the proposed works, it is intended that an enhanced network of footpaths and bridleways be created to replace those to be stopped up. However, in the meantime, it is necessary to consider the availability of routes that the public could use to gain access around the site whilst it is operational. The following routes are currently available:
- Fochriw Road and the immediately adjacent common provide adequate north - south access along the western flank of the proposed site.
 - South Tunnel Road similarly provides access along the southern limit of the proposed surface mine and along the northern boundary of the additional remediation land to the south of the mine. This route provides a link between Fochriw Road and the northern tip of Fochriw.
 - From the point at which South Tunnel Road meets the northern tip of Fochriw, Footpaths 83, 84 and 85 provide links to the unclassified road commonly referred to as ‘Red Ash Hill’ that descends to the A469.
 - To the east of the mine, the A469, and public roads serving the Capital Valley Eco Park and the Heads of the Valleys Industrial Estate, provide access along the eastern flank of the site, together with Bridleway 88.
 - Bridleway 93 lies immediately north of the proposed northern site boundary of the surface mine and provides access from the public highways on the eastern side of the site, immediately north of the Heads of the Valleys Industrial Estate, but only as far west as Upper Cwm Carno Farm. From this point, there is no public right of way that suitably connects Bridleway 93 to Fochriw Road to the west of the proposed site.

- 3.428 To complete the links around the proposed mine, it is clear that a westward extension of Bridleway 93 is required, to meet with Fochriw Road. It is therefore intended that the application under Section 257 of the Act includes provision for a bridleway to be provided as an alternative highway to complete the link between Bridleway 93 and Fochriw Road.
- 3.429 The Alternative Highway would follow the site boundary and is depicted as 'Bridleway AH1' on Planning Application Drawing MA/NL/PA/039. It would be formed inside the planning application site boundary but outside the fencing of the operational area of the mine.
- 3.430 This, together with the existing Bridleway 93 would provide a route to the north of the surface mine that could be followed on foot or on horseback, providing a link between the communities to the east and the public highway, rights of way and urban common to the west. This route is intended to be created as a permanent route at the commencement of the Nant Llesg scheme and would therefore be open to the public for the duration of the proposed surface mining operations and beyond.
- 3.431 The intention is to apply for an order under Section 257 of the Act for the permanent stopping-up of the rights of way, rather than a temporary provision for mining purposes under Section 261 of the Act.
- 3.432 The aim of this approach is to initially permit a geophysical survey of the land to be carried out to locate both known and unknown old mining shafts and adits. Once located, they would be investigated and remediated accordingly in consultation with the Coal Authority. As the true location of these abandoned mine entrances isn't currently known, it is not possible to pre-determine with any certainty which of the public rights of way would be affected by the remediation works. It is therefore necessary to initially close all rights of way which cross the site to ensure that the proposed works can be carried out effectively, with permissive access through the remediation works to be provided where reasonably possible and reinstatement of improved routes on completion of the remediation works.
- 3.433 Secondly, the aim is also to permit the creation of an alternative network at the end of surface mining operations that would not simply reinstate the rights of way precisely on their original alignments (as would be necessary under Section 261 of the Act), but would replace and enhance the existing network with routes that reflect more positively and sympathetically the cultural heritage, nature conservation and informal recreational features that have been incorporated into the restoration strategy for the scheme.
- 3.434 Within approximately two years of the commencement of coaling operations on site, the remediation works to the peripheral land east and west of the operational area of the surface mine, together with the land to the south, would have been completed. The formal rights of way through the remediated land would be formally stopped up prior to commencement of site operations, but would be replaced with routes along similar alignments made available to the public as permissive routes for use on foot and on horseback while investigative and land remediation works take place, with appropriate diversions from time to time as the works require. Following completion of the remediation works, more permanent alignments would provide north-south links along the fringes of the site, through areas that have been remediated. The indicative routes within these areas are illustrated on Planning Application Drawing MA/NL/PA/038.
- 3.435 The proposed rights of way network for reinstatement at the end of surface mining operations to complete the network illustrated in the restoration strategy is shown on Planning Application Drawings MA/NL/PA/039 and MA/NL/PA/009. To create the proposed network of public footpaths and bridleways illustrated in the restoration strategy, it is proposed that Miller Argent

enters into a series of Public Path Creation Agreements with the Planning Authority, and other landowners of the site, under Section 25 of the Highways Act 1980. To facilitate the execution of these agreement at the appropriate times (that is when sections of the site become available as part of the progressive phased restoration scheme), Miller Argent would be willing to enter into a Section 106 Agreement as a condition of planning permission being granted.

- 3.436 The final layout would reflect the original network and would be to a condition no less convenient to the public. Indeed, as many of the existing routes have remained impassable for some time, the proposed network would likely be substantially more usable by the public. However, as the restored landform would differ from the existing landform and new landscape features are to be established that would include both cultural heritage and nature conservation features, the alignment of the new routes would more closely reflect the restored landscape. This is considered preferable to reinstating all routes on their original alignment. The overall effect of the new network would be to pragmatically replace and add to the existing network whilst recognising restored landscape features and changes to the micro-topography brought about by the development. It would also afford the public enhanced routes for access over restored private land and urban common and complement their right to traverse the wider area of the urban common on foot or on horseback.
- 3.437 The environmental effects of the proposed closure of the routes and the provision of the restoration network on completion of site operations is addressed in the Recreation and Tourism assessment at Chapter 6 of this Environmental Statement. The proposed network is set out on the Restoration Strategy Drawing MA/NL/PA/009 (MA/NL/ES/016/012-2). The existing network is shown on Planning Application Drawing MA/NL/PA/037. The routes to be created within 2 years of commencement of coaling on the peripheral 'early remediation' areas are shown on Drawing MA/NL/ES/038, while those to be created at the end of surface mining operations are shown on Drawing MA/NL/ES/039.

Existing Rights of Way Network

- 3.438 Consultation with the registration authority, Caerphilly County Borough Council, and inspection of the definitive map and statement, identified nine footpaths and one bridleway that cross the application land as registered rights of way. It is proposed that ten lengths of those footpaths and the length of bridleway that lie within the planning application site boundary be permanently stopped-up prior to development of the scheme proceeding and replaced by an enhance public rights of way network as part of the restoration of the land.
- 3.439 An application is to be made for a Public Path Stopping-up Order under Section 257 of the Town and Country Planning Act 1990 in respect of the public rights of way that lie within the planning application site boundary. The effect of the Order would be to stop-up those lengths of Footpaths 86, 90, 91, 95, 96, 97, 100, 150 and 151 and Bridleway 146 that lie within the planning application site area; and to create an Alternative Highway as 'Bridleway AH1' along the north-western boundary of the site.
- 3.440 All routes to be stopped up are shown on Planning Application Drawing MA/NL/PA/037 with the Alternative Highway 'Bridleway AH1' being shown on Planning Application Drawing MA/NL/PA/039.
- 3.441 The Alternative Highway 'Bridleway AH1' would provide a westerly extension to the existing bridleway Gelligaer BR193 to provide an immediate means of access on foot or on horseback across the northern boundary of the site. This would consequently be available as a public right of way from the outset of operational activities on site.

Proposed Rights of Way Network

- 3.442 To facilitate the creation of the replacement network as part of the restoration strategy for the Nant Llesg scheme, Miller Argent propose to enter into a planning obligation under Section 106 of the Act. The obligation would provide for a Public Path Creation Agreement to be entered into with the registration authority and the necessary orders being prepared and submitted as appropriate at no cost to the public purse. The strategy for the creation of the replacement rights of way network is depicted on the Restoration Strategy Drawing MA/NL/PA/009 (MA/NL/ES/016/012-2).
- 3.443 While investigations and remediation works take place in areas included in the proposals solely for those purposes, permissive bridleways and footpaths would be made available through the areas. These routes would generally follow current alignments but, where necessary, areas for land remediation would be fenced out for safety purposes and alternative routes would be provided. After the first 12 to 24 months of coaling, the planned remediation works would have been completed and the proposed replacement routes that cross these areas could be formalised. Indicative routes to be provided as footpaths and bridleways after the first two years of coaling are shown on Planning Application Drawing MA/NL/PA/038 and would include:
- A new bridleway to link the Rhymney Valley Ridgeway Walk south of the operational area to the bridleway 'Gelligaer BR89' half way along the road through the Heads of the Valley Industrial Estate;
 - It would also link to another new permissive footpath running north from 'Gelligaer BR89' along the edge of new woodland planting.
 - A footpath would be provided to the south of the surface mine, to replace 'Gelligaer FP151'. The route would be chosen to avoid any localised land remediation areas along the way following the stabilization of old mine shafts and adits.
- 3.444 The permissive bridleways, footpaths and public highways, running along the eastern flank of the site, would provide northerly links from the urban common in the south to the existing bridleway, 'Gelligaer BR93', that runs just outside the northern site boundary, and which, in turn, would link to the bridleway created as Alternative Highway 'Bridleway AH1' at the start of site operations. This would connect 'Gelligaer BR93' to Fochriw Road to the west of the site.
- 3.445 The permissive footpath to replace 'Gelligaer FP151', which would run along the western flank of the application site south of the surface mine, would provide a northerly link from the settlements of Fochriw and Pentwyn in the south to South Tunnel Road near its junction with Fochriw Road. From here walkers would be able to access the adjoining urban common and follow the line of South Tunnel Road eastwards towards Pontlottyn or Fochriw Road northwards towards Dowlais Top. Most of the early remediation land along the western flank of the surface mine would also be available for public access at this time.
- 3.446 The remainder of the site would be subject to longer-term works and facilities associated with the surface mining operations, which are anticipated to take approximately 14 years to complete. This would be followed by a minimum 5-year period of aftercare. As surface mining operations progress from west to east, the reinstated landform would be progressively restored as each stage of mining operations is completed. Progressive restoration and aftercare schemes would be submitted for the approval of the mineral planning authority and, if approved, implemented in stages until such time as site operations are complete. At this time, the whole of the proposed rights of way network would be physically established as part of the approved restoration proposals.

- 3.447 As each stage of the restoration becomes more established, it is likely that some routes would be made available as permissive paths before the end of each aftercare period; provided that there is no conflict with on-going aftercare works and no public safety issue.
- 3.448 Following surface mining operations and the restoration and aftercare of the land, the indicative routes shown on the Restoration Strategy Drawing MA/NL/PA/009, MA/NL/ES/016/012-2 and on Planning Application Drawing MA/NL/PA/039, would be formally created as a public right of way. The final network would follow alignments that 'fit in' with the final designs for the progressive restoration and aftercare of the land as approved by the mineral planning authority.
- 3.449 The environmental impact of these proposals is considered in the Recreation and Tourism Section at Chapter 6 of this Environmental Statement.

Planning Policy Context

- 3.450 MTAN2 recognises that public rights of way often cross coal working sites and need to be diverted or extinguished for the duration of the permission (Paragraph 95) and then reinstated via the construction of new paths as part of the restoration scheme, which should be dealt with by planning obligations (paragraph 274). MTAN2 also advises applicants to identify the routes at an early stage, and discuss them with the Planning Authority (paragraph 95).
- 3.451 Such discussions have been held, and in terms of surface mining proposals there is nothing particularly unique about the rights of way which would be affected by the Nant Llesg scheme, given that such effects are common to all such surface mining schemes. Conventional measures are available to formalise the stopping up of the rights of way, to provide alternative routes during the development works, and for the rights of way network to be reinstated as part of the restoration scheme (see Planning Act Section 257 and Highways Act Section 25).
- 3.452 These issues are thus capable of being fully regulated by the framework of legislative controls, and for a comprehensive and enhanced network of rights of way and permissive paths to be delivered as part of the restoration strategy for the scheme.

Common Land

- 3.453 Mineral Planning Policy Wales (MPPW) recognises that mineral development is transitional and cannot be regarded as a permanent land use even though operations may occur over a long period of time. Advice and guidance on carrying out such works on common land is provided in Minerals Technical Advice Note 2: Coal (MTAN2). Consent is required from the Welsh Ministers under Section 38 of the Commons Act 2006 before the proposed works can be carried out on the common.
- 3.454 Including the area of Cwmbargoed Disposal Point, which has been fenced out of the common since 1957, approximately 338 ha or approximately 71% of the 478.1 ha planning application site area forms part of the Gelligaer and Merthyr Urban Common (CL38). The urban common measures some 3,090 ha in extent, 10.9% of which would lie within the planning application site area.
- 3.455 Excluding Cwmbargoed Disposal Point, approximately 315 ha of common land would be affected by the Nant Llesg surface mining operations and the proposed land remediation works. Of this, about 114 ha would be occupied for a relatively short period of 12 to 24 months from

the commencement of coaling while the short-term surface land remediation works are carried out. The land would be progressively released for common grazing and public access, with some minor areas being further managed for ecological or cultural heritage enhancements. The remainder, however, some 201 ha or 6.5% of the urban common would be occupied for the longer period of c.14 years for the proposed surface mining and land restoration works, which would be followed by a minimum 5 year period of aftercare of the land. The likely period for the longer-term operations therefore being approximately 19 years.

3.456 There is no requirement in Section 38 of the Commons Act to provide compensatory land in lieu of the temporary occupation of common land. However, notwithstanding the absence of a legal requirement, in recognition of the period proposed for the surface mining operations, Miller Argent has sought to identify suitable areas of land to be offered for common grazing and/or public access to mitigate the period of occupation of common land being sought. The study has included land contiguous with the common and in proximity to the Nant Llesg site that is in their ownership and similar land owned by others that it has been established can be made available. The resultant study areas, together with the areas of common land affected by the proposals, are shown numbered 1 to 14 on Planning Application Drawing MA/NL/PA/035.

3.457 Having identified the extent of available land, all areas have been environmentally assessed to inform a decision of which areas are most suitable as mitigation land to be offered as compensation for the extended occupation of the common land. The likely environmental effects on all areas are assessed in the following individual chapters of this Environmental Statement:

- Cultural Heritage
- Ecology and Nature Conservation
- Agricultural Land Use and Soils
- Landscape and Visual Amenity
- Recreation and Tourism

3.458 The suitability of the areas has therefore been assessed with regard to their potential suitability in relation to the criteria set out in the Commons Act. Section 39(1) and (2) of the Act states:

- 1) *“39 (1) In determining an application for consent under subsection (1) of section 38 in relation to works on land to which that section applies, the appropriate national authority shall have regard to -*
 - (a) the interests of persons having rights in relation to, or occupying, the land (and in particular persons exercising rights of common over it);*
 - (b) the interests of the neighbourhood;*
 - (c) the public interest;*
 - (d) any other matter considered to be relevant.*
- 2) *The reference in subsection (1)(c) to the public interest includes the public interest in -*

- (a) *nature conservation;*
- (b) *the conservation of the landscape;*
- (c) *the protection of public rights of access to any area of land; and*
- (d) *the protection of archaeological remains and features of historic interest.”*

- 3.459 The initial stage of the assessment is set out in matrix form at Appendix MA/NL/PA/A007 to the Planning Statement and considers the suitability of the land in each of the search areas for the land-use options of:
- public access; and/or
 - public access and grazing.
- 3.460 Nine areas, Areas 6, 7, 8, 9, 10, 11, 12, 13 and 14, were considered as potential areas for temporary or permanent grazing and/or public access for the duration of the Nant Llesg scheme. These areas can be seen of Planning Application Drawing MA/NL/PA/035.
- 3.461 Areas 6 and 13 were discounted since they fell within the areas of early remediation works. Area 14, which consists of the disused railway cutting currently used as an inert landfill site within the central operational area of the mine, has been considered as potentially suitable for permanent grazing/public access when restored as common land at the end of the project, but it is required for the duration of the scheme.
- 3.462 Area 10 was divided into three areas (10a, 10b and 10c). Area 10c was discounted as, although it was not currently in farming use, it had been identified as an area for ecological enhancement to compensate for the biodiversity loss due to the scheme. Area 10a and 10b were discounted because of the effect on local farm structure, since it is already in use for farming.
- 3.463 It can be seen from the matrix at Appendix MA/NL/PA/A007 to the Planning Statement that Areas 7, 8, 9, 11 and 12 have been assessed as suitable land to be offered as temporary common grazing and/or for temporary public access in mitigation of the proposed occupation of the common. In addition to these, Areas 9 and 14 would become available after surface mining operations are complete for potential registration as additional permanent urban common land.
- 3.464 The areas assessed as suitable for temporary common grazing and/or public access for the duration of the scheme can be sub-divided into two groups:
- Land suitable for public access – Areas 7 and 8; and
 - Land suitable for public access and grazing – Areas 9, 11, and 12.
- 3.465 In addition to these areas, the land to be restored to urban common on completion of mining operations would include Area 14. This area is currently an inert landfill facility which follows the cutting of a disused railway. During site operations the waste would be investigated and remediated as necessary before being capped and over-tipped with overburden. On restoration of the site, Area 14 would be restored in a similar manner to the surrounding land and made suitable for use as part of the urban common. It is therefore also considered as an area that would eventually become suitable for common grazing and public access.

3.466 The findings of the study are summarised in the following Table 3.5:

Table 3.5 – Areas considered suitable for common grazing and/or public access

Study Area	Suitable Land Use	Ha	Percentage of Urban Common (CL38 – 3091 ha)	Availability
Area 7	Public Access	13.48 ha	0.44%	Available for the duration of surface mining operations, restoration and aftercare at Nant Llesg
Area 8	Public Access	58.65 ha	1.90%	Available for the duration of surface mining operations, restoration and aftercare at Nant Llesg
Area 9	Common Grazing & Public Access	6.18 ha	0.20%	Available for the duration of surface mining operations, restoration and aftercare at Nant Llesg and available for creation as additional common land on completion of surface mining operations, restoration and aftercare at Nant Llesg
Area 11	Common Grazing & Public Access	25.34 ha	0.82%	Available for the duration of surface mining operations, restoration and aftercare at Nant Llesg
Area 12	Common Grazing & Public Access	49.63 ha	1.61%	Available for the duration of surface mining operations, restoration and aftercare at Nant Llesg
Area 14	Common Grazing & Public Access	5.35 ha	0.17%	Available for creation as additional common land on completion of surface mining operations, restoration and aftercare at Nant Llesg

3.467 The areas referred to in Table 3.5 are shown on Planning Application Drawing MA/NL/PA/036.

3.468 From the figures provided in Table 3.5, it can be seen that the total of Areas 7, 8, 9, 11 and 12, being 153.28 ha, is considered suitable to be offered as mitigation land for common grazing and/or public access for the duration of surface mining operations, restoration and aftercare of the land. This amounts to approximately 76% of the 201 ha of common land being occupied for that period and is equivalent to 5% of the total area of the Gelligaer and Merthyr Common.

3.469 In addition to the provision of land for temporary grazing and/or public access, a further 11.53 ha of land would be proposed for registration as permanent urban common land on completion of site operations. This would be made up of 5.35 ha, being the restored area of the inert landfill site (Area 14); and 6.18 ha of land lying adjacent to the access road to Bryn Caerau Farm (Area

- 9) (See Planning Application Drawing MA/NL/PA/036). Both these areas would be rendered suitable for use as permanent urban common land during the intervening period. Miller Argent would enter into a planning obligation under Section 106 of the Town and Country Planning Act 1990 to undertake the preparation and submission of the necessary application to the Welsh Ministers for the dedication of the land as urban common land at the appropriate time.
- 3.470 The total area of land being offered to mitigate the occupation of urban common amounts to 153.28 ha or 76% of the 201 ha of common land being occupied for surface mining. The net loss in terms of public access land therefore amounts to some 48 ha or 1.6% of the total area of the common.
- 3.471 In terms of common grazing land, the area being offered in mitigation is 81.15 ha or 40.37% of the 201 ha to be occupied. The net loss here therefore being some 120 ha or 3.88% of the total area of the common.
- 3.472 Certain areas, being some 111.66 ha of common land, would be occupied for a shorter period of up to 2 years from the commencement of coaling. These are the areas required for early remediation works and are shown shaded blue as Areas 3, 4 and 5 on Planning Application Drawing MA/NL/PA/036. The remediation works would be associated with old shaft and adit stabilisation and surface drainage works, with surface remediation of other minor areas of former mining disturbance. Such works would be carried out in the early stages of the Nant Llesg scheme and would be completed within 12 – 24 months of the commencement of coaling. They would occupy relatively small and discreet areas of land within the general remediation areas shown on Planning Application Drawing MA/NL/PA/036 and would be individually fenced out as necessary while the works are carried out and while each area undergoes a period of aftercare. Consequently, the larger tracts of land between these areas would become available for release to common grazing and public access within 12 – 24 months of the commencement of coaling. It is anticipated that areas would become available in stages during this time, with the remediated areas also becoming available well in advance of the completion of surface mining operations, as and when their aftercare has been completed to the satisfaction of the Mineral Planning Authority. Such early remediation and release of such large tracts of land is considered to be an important factor of the common land strategy and provides considerable mitigation in terms of public safety and public amenity as a benefit of the scheme.
- 3.473 By way of further mitigation, the Applicant intends to enter into an appropriate agreement with the commoners for the suspension of the rights of common over all common land within the planning application site area for the duration of the proposed operations. This would be negotiated through the Commoners Association and those commoners most affected by the proposed scheme prior to commencement of the scheme.
- 3.474 Notwithstanding this, Area 2 on Planning Application Drawing MA/NL/PA/036 is already subject to an agreement with the commoners whereby stock is withdrawn from the area and will remain withdrawn beyond the life of the Nant Llesg Surface Mine.
- 3.475 MTAN2 provides the following advice at paragraph 81:

“Common Land

81. *Planning Policy Wales recognises that common land is a finite resource and should not be developed unnecessarily. Access to it should not be prevented or impeded unnecessarily and its proper management should be encouraged. The Countryside and Rights of Way Act 2000 created new rights for people to walk on areas of open country and registered common land. Where planning permission is being granted for development of common*

*land the consent of the Welsh Ministers may be required under the various common land legislation provisions. The Commons Act 2006 provides for better protection for common land and greens by streamlining the consents system for works and fencing on commons and ensures that existing statutory protections are applied consistently. Part 3 of the Act contains provision to prohibit the carrying out of works on certain common land without the consent of the Welsh Ministers and makes provision about how consent may be obtained. It replaces section 194 of the Law of Property Act 1925, the main existing statutory control on works on common land, which is repealed. **This means that works connected with the taking or working of minerals do not require consent under section 194 of the 1925 Act but will require consent under section 38 of the Commons Act 2006 on relevant land.**" (Emphasis added)*

- 3.476 The application being submitted to the Welsh Ministers for consideration under Section 38 of the Act ("the Common Land Application"), proposes that the works, as set out in the Planning Application and assessed in this Environmental Statement, be carried out as temporary works on that part of the Gelligaer and Merthyr Urban Common (CL38) contained within the planning application site area.
- 3.477 The Common Land Application will also include the strategy set out above of voluntarily providing temporary common grazing and/or public access land to mitigate the occupation of the urban common for the period of the proposed works, despite there being no requirement to do so under the provisions of Section 38.
- 3.478 In relation to the impacts on the urban common, the environmental assessment considers both the likely environmental impacts of the Nant Llesg proposals and the cumulative impacts with FLRS.

Planning Policy Context

- 3.479 The advice on Common Land set out in paragraph 81 of MTAN2 is reproduced in full above. As required by the Commons Act 2006, a separate application will be submitted to the Welsh Ministers under the provisions of Section 38 of the Act to carry out temporary works on that part of Gelligaer and Merthyr Urban Common contained within the application site area.
- 3.480 The merits of the application will be separately considered by the Welsh Ministers, but, in planning terms, it is important to note the context of:
- the temporary nature of the works;
 - the proposal to provide temporary areas for grazing and/or public access for the duration of the development covering a surface area of some 153.28 hectares (albeit this is not an express requirement of the Commons Act);
 - the intention to retain some of the temporary areas as permanent common and to supplement it with additional land for use as permanent common upon completion of the development (totalling some 11.53 hectares);
 - the improvement in safety of the common with the location and treatment of old mine shafts and adits within both the surface mine and the adjoining land remediation areas (some of which would be returned to commons use within 2 years of commencement of coaling operations); and

- the restoration scheme, which would restore the common to similar topographic conditions and land uses, but with potentially enhanced soil conditions in the northern area of the site within an area of historical shallow surface mining/restoration.

Nant Llesg Surface Mine

Incorporating Land Remediation

Chapter 4

Site Selection and Alternatives

Nant Llesg Surface Mine

Incorporating Land Remediation

Environment Statement

Chapter 4 - Site Selection and Alternatives

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4. Design Evolution and Alternatives

Site Selection

- 4.1 When it comes to the selection of mineral working sites, it is heavily dictated by the presence of the mineral itself. Mineral working is different from other forms of development as they can only be worked where they occur. This is recognised at paragraphs 5 and 12 of Mineral Planning Policy Wales. In the case of the Nant Llesg coal resource, it was initially identified as a recoverable resource by British Coal and subsequently included in the prospectus for the privatisation of the coal industry. The presence of the Nant Llesg coal resource is also recognised in the Caerphilly Local Development Plan. The need for the coal is set out in Chapter 15 of the Planning Statement and the applicant is not aware of an alternative indigenous resource of a similar size and quality that would permit the selection of an alternative site able to deliver a similar quantity of this particular type and quality of coal to meet the needs of the market.

Scheme Design Evolution

- 4.2 During iterative project design, extensive pre-planning and community consultation has been undertaken. This was in addition to on-going environmental assessment. As a consequence of these activities, the proposals for the Nant Llesg Surface Mine along with the incorporated land remediation works have undergone considerable review. Changes have been made from the initially envisaged 9 million tonne scheme originally presented to the public in 2011 to a more conservative 6 million tonne scheme. This has arisen as a result of significant changes having been made to the layout of the mine and land remediation proposals. Significantly, the changes include:

- Substantial additional areas of land have been included within the planning application site area for surface land remediation works. The southern limits of such land were subsequently revised to exclude areas where no requirement for remediation has been identified, while its south-eastern limit has been extended slightly north of Fochriw to include additional land in need of remediation;
- A small area of Cwm Carno Tips in the north western sector of the site has been excluded from the scheme. On-going environmental assessment identified both ecological and heritage interests that outweigh the limited benefit to be gained from re-contouring the tips in this area within the confines of the surrounding topography. With no overriding public safety issue pertaining to this area, it was decided that the area should be excluded from the scheme;
- An additional water treatment area was proposed south of 'South Tunnel Road' on land belonging to Caerphilly County Borough Council. This has since been relocated to the operational area of the surface mine north of 'South Tunnel Road' (Water Treatment Area WT4);
- The southern embankment of Rhaslas Pond has been identified as having particular archaeological value and has, in the period since scoping, been considered for scheduling as a Monument by Cadw. It has therefore since been treated as a Scheduled Monument in the on-going design of the scheme and the proposals have been amended to reflect the intended scheduling. It is now proposed that the southern embankment and the southern part of the pond be protected and retained for the duration of operations. Consequently, the proposed overburden storage area has been redesigned and withdrawn from the pond accordingly;

- The existing inert landfill site that occupies the disused railway cutting leading north off South Tunnel Road has been incorporated within the scheme. The landfill has been the subject of a ground investigation report and a scheme designed for the appropriate handling, treatment and/or removal of waste before the area is tipped over with overburden;
- Given the inclusion of the landfill site, the two overburden storage mounds originally proposed have been replaced by a single mound. This has enabled the overburden storage mound to be withdrawn from Rhaslas Pond;
- The 'Limit of Excavation for Coal Working' has been withdrawn to a line 500m from the settlement boundary, resulting in it being some 689m or more from the residential settlement at Rhymney. The results of ground investigations indicated that the basal seam, the Lower Four Feet, diverges from the other coal seams, increasing the interburden between it and the Little Vein from approximately 3m to some 25m or more. The Lower Four Feet Seam has therefore been excluded from the scheme. This has resulted in a lower maximum depth of extraction and a consequential reduction in the volume of overburden to be stored above ground. The combined consequence of these factors has reduced the recoverable tonnage of coal from 9 million to 6 million tonnes;
- The overburden storage mound being of a smaller footprint (104ha reduced to 86ha) has also been withdrawn to a line 500m from the settlement boundary;
- A visual and acoustic screening bund is now proposed to the north and east of the proposed coal working excavation area. This will screen the coal working excavation area from most residential properties within Rhymney;
- Storage areas for topsoil, subsoil, peat and soil forming material have been remodelled and relocated to accommodate the above changes;
- There have been minor changes to the site boundary to reflect a search of land ownership titles and a pond in the eastern part of the site just north of South Tunnel Road has been excluded from the scheme;
- The proposed diversion of a 33kv overhead power-line to the west of the operational area of the surface mine has been agreed with Western Power Distribution. The diversion of the power line in relation to the operational area is described earlier in this chapter and is depicted on Planning Application Drawing MA/NL/PA/003. The positioning of the diverted line has defined an area of land to the west of the operational mine that is now to be made available for early remediation and return to common grazing and public access within 12 to 24 months of the commencement of coaling operations. The area is shaded purple on Planning Application Drawing MA/NL/PA/003;
- A significant section of land to the east of the operational mine would now be remediated. Public rights of way would be stopped up to enable works to take place. While remediation works take place, permissive access will be allowed through the area, generally on routes currently available but subject to some minor diversions while works take place. Upon completion of remediation new routes would be formalised. The corridor within which such access and grazing are to be made available is shaded purple on Planning Application Drawing MA/NL/PA/003;
- Because of the presence of a lapwing nesting site and other areas of ecological interest, all office accommodation, staff welfare, car parking, plant maintenance, barrel washing and vehicle washing facilities would now be located within the operational area of the mine. Previously, it had been proposed that such office accommodation and staff

welfare facilities be located to the south of South Tunnel Road on land in the ownership of Caerphilly County Borough Council;

- All coal from the Nant Llesg Scheme would now be hauled by road to Cwmbargoed Disposal Point. Coal lorries would leave the Nant Llesg Mine at Access Point 'A' (Planning Application Drawing MA/NL/PA/003) turning left onto Fochriw Road and then right onto Bogey Road before turning left into the Cwmbargoed Disposal Point via the existing access lane to Access Point 'B'. Returning vehicles would leave the disposal point at Access Point 'C', turning right onto the Bogey Road and then left onto Fochriw road to follow the same route to re-enter the mine at Access Point 'A'. Previously, it was envisaged that a coal haulage route would need to be constructed across land to south of South Tunnel Road in the ownership of Caerphilly County Borough Council, or to the west of the site over land north of the Bogey Road. Either route would have required two controlled crossing points where they crossed the public highways and both brought the proposed route over or within close proximity of areas of high nature conservation value. The revised route is therefore the least environmentally disruptive option;
- To facilitate the achievement of the best scenario for the above coal haulage proposals, it is now proposed that improvements be made to the layout of the junction between Fochriw Road and the Bogey Road and the vertical alignment of Fochriw Road to the south of it. These works would significantly improve what is presently a poorly sighted junction, particularly for the leg leading south along Fochriw Road. Other minor improvements would also be carried out at Access Points 'B' and 'C' to provide appropriate radius kerbs, road marking and signage to facilitate the proposed haulage routes and to deter vehicles from turning left onto the Bogey Road when leaving the disposal point. Planning Application Drawing MA/NL/PA/027 illustrates the proposals;
- A new coal washing plant would be located within the northern sector of Cwmbargoed Disposal Point. The washing plant would be enclosed within a purpose-built building and would be capable of processing up to 400 tonnes per hour to meet the higher specifications of the current market. The original proposal was to build the plant within the operational area of the Nant Llesg mine. Its location within Cwmbargoed Disposal Point permits the processing of both Nant Llesg and Ffos-y-fran coals;
- A new water recycling facility is proposed on land within Caerphilly County Borough to the west of the existing disposal point. The facility would service the new coal washing plant and provide the anticipated additional capacity needed to operate the plant through periods of dry weather. The facility would be fed during periods of wet weather by surface water runoff collected by the existing disposal point drainage system and pumped into the facility to be stored until needed. The facility is designed to eliminate, as far as practicable, the need to use mains water to run the new coal washing plant;
- Because of the construction of the Coal Wash Plant and the associated water recycling facility, the part of Cwmbargoed Disposal Point within the County Borough of Caerphilly is now included within the scheme; all development of the new coal washing plant and water recycling facility and all coal processing and dispatch operations relating to the plant and coal production from the Nant Llesg surface mine being contained within that area;
- Given the potential for the scheme to continue beyond the completion of coaling at the Ffos-y-fran Land Reclamation Scheme and given the expiry of the planning permission for the Cwmbargoed Disposal Point on 31 December 2024, it is proposed that the parts of the Cwmbargoed Disposal Point included within the application site boundary are allowed to continue in use for the duration of the scheme. This will require some changes to the water treatment areas currently within the Cwmbargoed Disposal Point

and will enable restoration of those parts of the Cwmbargoed |Disposal Point beyond the planning application boundary to be restored in accordance with the current conditions in the current planning permission.

- The strategy for dealing with the occupation of common land for the duration of surface mining operations now incorporates the compensatory provision of substantial areas of land for temporary grazing of stock and permissive access by the public. Such provision is not required under Section 38 of the Commons Act 2006 but is offered voluntarily in mitigation of the temporary albeit long term occupation of common land within the site for a period of approximately 19 years. On restoration of the site, certain areas will also be put forward for registration as permanent common land, providing a net increase in the area of the urban common. In order to understand why various areas in Miller Argent's ownership are not included as compensatory provision, all areas available have been assessed, and some are excluded on the basis of the environmental effects of using them for compensatory provision;
- The incorporation of a substantial area of off-site biodiversity and ecological enhancement of the Bryn Caerau Farm in the nearby Cwm Golau valley is proposed to offset other adverse ecological impacts and to ensure that an overall ecological balance is maintained in the long term;
- The archaeological investigations of the proposed scheme have identified aspects of cultural heritage which are now built into the restoration strategy for the scheme. These include the retention of the southern embankment of Rhaslas Pond and the representation of its northern embankment as a raised mound with stone markers in the restored landscape; the representation of features of the mining heritage of the area and of the Dowlais Free Drainage System. Community involvement in cultural heritage schemes and heritage aspects of the restoration would also be encouraged;
- Training initiatives to maximize local social economic and local employment benefits, with an outline strategy to achieve this prepared (Appendix MA/NL/ES/A05/002);
- Use of noise attenuation on site plant (see Chapter 13: Noise and Vibration).

Alternatives

- 4.3 The EIA Regulations require that Environmental Statements include such information as is reasonably required in Part I of Schedule 4 of the Regulations to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile; and that it includes at least the information referred to in Part II of Schedule 4.
- 4.4 Both Part I and Part II of Schedule 4 require 'an outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects'.
- 4.5 Appendix F of MTAN2: 'Best practice for Environmental Impact Assessment' advises that the EIA process should begin when the project is initiated and 'the environmental issues should influence the alternatives considered and chosen (different sites, site design, or processes).
- 4.6 Miller Argent has adhered to this best practice and the resultant differences in site design and processes that have evolved from an iterative approach to the design of the development are set out above under the heading 'Scheme Design Evolution at paragraph 4.2 above. Consideration of 'different sites' amounts to an assessment of the ability to 'Mine the coal somewhere else'. This is considered below.

- 4.7 It is a principle of minerals development that minerals must be worked where they lie. With this principle in mind, the main alternatives to working the Nant Llesg Surface Mine and to carrying out the proposed land remediation works in the manner proposed can be summarized as follows:
- Recover a larger or smaller tonnage of coal;
 - Work the Nant Llesg reserve after Ffos-y-fran;
 - Not remediate the land;
 - Do Nothing.

Recover a larger or smaller tonnage of coal

- 4.8 The original scheme tabled with the Mineral Planning Authority and publicised at the outset of the community consultation exercise was for the recovery of 9 million tonnes of coal over a 15 year period. This proposal did not include any of the changes listed at paragraph 4.2 above.
- 4.9 The original scheme was designed to comply with the principles of the Welsh Government's minerals policy set out in Mineral Planning Policy Wales (MPPW) and to work within the constraints of the advice provided in Minerals Technical Advice Note 2: Coal (MTAN2). Given that there is no requirement for a 500 metre standoff from the settlement boundary in the Local Development Plan, the coal working excavation area was designed to stand off the industrialised area on the western settlement boundary of Rhymney by 200m. The site boundary would have been at least 500m from the settlement boundaries of Fochriw and Pontlottyn.
- 4.10 The principal change to the scheme has been to withdraw the limit of excavation for coal working and the overburden storage area to at least 500m from the settlement boundary. This, in turn, moved it to some 689m or more from the residential area of Rhymney. The decision to do so followed discussions with Caerphilly County Borough Council (CCBC); feedback from the community consultation exercise regarding the proximity of the proposed workings and principally the perception of members of the community about the potential for noise, dust and visual intrusion; and operational considerations arising out of the then on-going exploratory drilling and other site investigations. The exploratory drilling had shown that the basal seam, the Lower Four Feet, diverges from the higher coal seams, increasing the interburden between it and the Little Vein from approximately 3m to some 25m or more. All matters being considered, the Lower Four Feet Seam was excluded from the scheme, resulting in a lower maximum depth of excavation and a reduction in the volume of overburden to be stored above ground. In making these changes, the aim was to achieve the optimum recovery of this important coal reserve with a scheme that could be considered to be both commercially viable and environmentally acceptable within the scope of current government policy, advice and guidance.
- 4.11 To pursue the larger tonnage of coal associated with the original alternative proposal would have greater environmental impacts. Whilst the larger scheme is not necessarily unacceptable, the smaller scheme is clearly able to be delivered with less environmental impacts.
- 4.12 Principally, of those listed above, the withdrawal of the operational area of the mine to a distance of 500m from the settlement boundary provides space and makes it practicable to include a visual and acoustic screening bund between the operational area of the surface mine and the settlement of Rhymney. Without it, operations over a far greater area of the working void would become more visible from a larger residential area of Rhymney and the noise impacts on parts of Rhymney would be greater.

- 4.13 Other environmental benefits associated with the early remediation of the eastern peripheral area would be reduced in scale and delayed by the need to excavate the area associated with a larger tonnage.
- 4.14 At 6 million tonnes, the scheme as proposed is considered by the applicant to be at the limit of its commercial viability. Any further reduction in the tonnage to be won, or in the operational area of the scheme, would have serious consequences in terms of its viability, threatening the recovery of the proven reserve and the support for the community benefits that have been built into the scheme. Recovery of a tonnage smaller than 6 million tonnes is therefore not considered to be an option.

Work the Nant Llesg Reserve after Ffos-y-fran

- 4.15 There is a current need for the coal. Current demand for coal of this type and quality is the reason for the Nant Llesg coal resource being brought forward for development. The need for the coal is set out in Chapter 15 of the Planning Statement.
- 4.16 Paragraph 34 of MTAN2 indicates a requirement to safeguard minerals that society may need, stating:

“Safeguarding shallow coal resources

34. *Coal can only be worked where it is found, and a long-term strategy is required to protect what may become a strategic resource. MPPW sets out the requirement to safeguard the minerals which society may need in paragraph 13:*

Areas to be safeguarded should be identified on proposals maps and policies should protect potential mineral resources from other types of permanent development which would either sterilise them or hinder extraction, or which may hinder extraction in the future as technology changes. The designation does not indicate an acceptance of working, and may be overlapped by the areas where coal working will not be acceptable during the plan period. To identify areas for safeguarding, it is necessary that the location and quality of the mineral is known and that the environmental constraints associated with extraction have been considered.”

- 4.17 The Nant Llesg coal resource is amongst those safeguarded in the Caerphilly Local Development Plan. Being so protected, it is indeed conceivable that it be worked at some future date following the Ffos-y-fran Land Reclamation Scheme. However, to do so would deny the established current need for the coal as set out at Chapter 15 of the Planning Statement.
- 4.18 As the purpose of its designation as a safeguarded mineral resource is to avoid sterilisation or its extraction being hindered should it be needed to meet the needs of society, it follows that the need for the coal established at Chapter 15 of the Planning Statement warrants its recovery now and not at a later date following Ffos-y-fran.
- 4.19 As such delaying the project until after the Ffos-y-fran land Reclamation Scheme is complete, or indeed until some other event takes place, is not considered to be an option.

No Land Remediation

- 4.20 The Nant Llesg Surface Mine could be worked entirely independently of the land remediation proposals currently included as part of the scheme. Indeed, the original scheme had not envisaged all the remediation works now proposed, the project site boundary lying entirely north of South Tunnel Road.

- 4.21 It has always been envisaged that the scheme would remediate disused shafts and adits left by former coal and iron ore mining and the original scheme included the potential remediation of some 138 such mine entries within the original site boundary. Miller Argent considers the remediation of such shafts and adits a responsible and necessary action, given the inherent danger to public safety presented by the risk of unstable mine entrances opening up on the urban common without warning. Given the opportunity to facilitate such works during the mining process, not to remediate such known hazards would appear to be an irresponsible approach to surface mining, particularly given the recognition of such benefits at paragraph 247 of MTAN2.
- 4.22 Proceeding without land remediation would also exclude the proposed drainage works to the south of the mine on disused colliery tips north of Fochriw. The exclusion of such works would remove the opportunity to contribute to addressing an acknowledged problem of silt originating in part from the scoured slopes of the tips being carried by the Nant Bargod into the lake at Darran Valley Country Park. The accumulation of such silt is of particular concern to the County Borough Council, which has already incurred considerable expense in dealing with the build-up of soft deposits at the point at which the Nant Bargod enters the lake; the build-up of unconsolidated deposits creating a potential hazard to fishermen and other members of the public. Again, not to seize the opportunity to try and improve the situation by carrying out and funding the extensive drainage works during the lifetime of the project, would appear to be a lost opportunity.
- 4.23 Not carrying out the remediation works removes an activity which is within 500m of the settlement boundaries at Fochriw and Rhymney. The activities, however, are not large-scale earth-moving operations as would be found on the surface mine, but relatively small-scale treatment of the surface. In the case of the remediation of shafts and adits these works would be small scale in nature and after a period of identification, would be completed in a rolling programme such that all works were completed within 12 to 24 months of commencement of coaling operations. In the case of the proposed drainage works these would take place over a period of some 12 weeks and would involve the application of predominantly natural materials to form, line, protect and armour existing and new water channels and embankments along the immediate reaches of the Nant Bargod in order to arrest and control the flow of surface water runoff from the tips. Noise impacts have been assessed as not significant due to the short period of operations involved. Air quality and dust impacts have been assessed as negligible, while the overall effect on the hydrology of the area has been assessed as being a significant positive impact. These assessments, the short duration of the works, and the potential community benefits to be accrued from their inclusion in the scheme at no cost to the public purse, renders any alternative scheme that does not remediate the land significantly less beneficial. Miller Argent has therefore elected to retain the land remediation works within the Nant Llesg scheme.

Do Nothing

- 4.24 The alternative of 'doing nothing' would be to leave the proven coal reserve in the ground. However, the proposal to work the Nant Llesg Surface Mine has been driven by the need for the coal. The justification for the scheme therefore lies beyond the Nant Llesg Site. The need case at Chapter 15 of the Planning Statement sets out in detail why the coal is required.
- 4.25 The alternative to working the site would be a need to mine coal elsewhere in the UK or to import coal from abroad. As the Nant Llesg coals are of the particular quality and specification of Welsh Dry Steam coal currently sought by the existing South Wales market, it is likely that suitable alternative reserves within the UK would not become readily available within the required timeframe. The alternative in the 'do nothing' scenario would likely be to import foreign coals. The considerably greater carbon footprint associated with the transport of imported coals in comparison to transporting most of the Nant Llesg coals to customers based in South Wales is self-evident.

- 4.26 The 'do nothing' alternative would fail to meet society's current need for the coal, running contrary to policy provided in Minerals Planning Policy Wales. It would also fail to provide the considerable community benefits package set out here and at Chapter 5: 'Social Assessment' of this Environmental Statement.
- 4.27 The do nothing scenario would also mean that the significant benefits of the scheme are not delivered. These include:-
- (i) the remediation of historic mining dereliction associated with the treatment of mining shafts and adits which will improve public amenity and create safe conditions for public access to extensive areas of land;
 - (ii) restoration of land to open mountain grassland, interspersed with woodland belts and a substantial package of new paths as a public amenity;
 - (iii) the improvement in the second worst mine water discharge in Wales which is unlikely to be rectified with public funds absent the scheme;
 - (iv) the improvement in the run off of siltation to the lake in Darren Valley Country Park;
 - (v) the improvement of visibility along the southern approach to the junction of Bogey Road and Fochriw Road to improve highway safety;
 - (vi) remediation and/or removal of waste from the MIS landfill;
 - (vii) a superior restoration of an area previously subjected to former and somewhat pioneering 'opencast' mining;
 - (viii) the creation of areas of nature conservation (and geo diversity conservation) as part of the restoration scheme, together with substantial off site biodiversity benefits at the Bryn Careau area; and
 - (ix) demonstrable employment and economic benefits associated with direct and indirect employment and the overall contribution to the local economy.
- 4.28 The 'do nothing' alternative is not considered by the Applicant to be a sustainable alternative to the scheme.

Conclusion

- 4.29 This chapter has outlined the main alternatives to the proposed scheme that the Applicant has considered. Taking into account the broad environmental effects of each of the alternatives and comparing them with those of the proposal as submitted, it is considered that the environmental, community and societal benefits built into the proposed scheme far outweigh any benefit that might be accrued from adopting one of the above alternatives. The reason for the Applicant's choice is driven by a preference to pragmatically encompass as many of the environmental issues and community requirements that have become apparent during the iterative environmental assessment and community consultation process as is practicable, and to deliver this much needed and high quality coal reserve in the most environmentally acceptable and sustainable way.

Nant Llesg Surface Mine

Incorporating Land Remediation

Chapter 5

Social Impact Assessment

Nant Llesg Surface Mine

Incorporating Land Remediation

Environment Statement

Chapter 5 - Social Impact Assessment

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5 Social Impact Assessment

Chapter Summary

- 5.1 The baseline assessment of the local area, which is defined by seven neighbourhoods¹ surrounding the Nant Llesg Surface Mine, Incorporating Land Remediation (“the Nant Llesg scheme”), identifies that there are some 10,100 residents. Within the following impact assessment, considerations are given to the economic impacts generated by the Nant Llesg scheme on this local area, and to a degree on the wider area of Caerphilly and Merthyr Tydfil county areas where most of the economic impacts on residents and businesses are likely to occur. This includes the changes in local labour and any impact that this might have on housing and other community infrastructure.
- 5.2 The population in the Nant Llesg local area has largely been static for some time and is projected to remain relatively unchanged for the period to 2030. Most (64%) of the local area resident population are of working age, which is positive for sustaining the area, but within this group, there is relatively high unemployment and long term unemployment, particularly among young men. There are also low levels of economic activity among the working age resident population, again with young men most prone to this. The consequence of low economic activity coupled with high unemployment is a problem for local prosperity.
- 5.3 This is evidenced further in the Index of Multiple Deprivation statistics, which shows widespread deprivation, with all neighbourhoods in the local area being within the most deprived 30% of neighbourhoods within Wales, and nearly half the neighbourhoods in the most severely deprived 10% of neighbourhoods in Wales. Local employment deprivation is a major problem, and education disadvantages have also been identified to be a moderate problem.
- 5.4 The Nant Llesg scheme is estimated to employ an average of between 144 and 239 workers on-site for 14 years of operation², plus 10 workers during the aftercare period. The range reflects whether a one or split shift (i.e. a two shift) working pattern is adopted at the Nant Llesg site, which depends on the impact of the working time directive³. After accounting for the multiplier effects of Miller Argent's investment, the project is estimated to support between 173 and 249 net additional local jobs based on on-site surface mining operations and land remediation, supplier spending created by the operation and spending by the on-site workers.
- 5.5 Miller Argent will be using local recruitment and are seeking to link with local partners such as training agencies and ‘Jobcentre Plus’ which will combine to enhance the social and economic benefits that the project can bring to the local area. The focus will be mostly on recruiting in the adjacent towns including Rhymney, where high unemployment or economic inactivity was assessed to be common among local residents. Given the extent of deprivation and the numbers of unemployed among young men in these areas in particular, the availability of local jobs is expected to be a major enhancement to local prosperity.

¹ The seven neighbourhoods are defined using Office of National Statistics (ONS) statistical areas known as Lower Super Output Areas (or LSOAs).

² The number actually working on site will be greater than this in some years, and likewise it might be less; hence these figures are the average across 14 years.

³ The Working Time Directive, 2003/88/EC, is a Directive of the European Union. It gives EU workers the right to a minimum number of holidays each year, paid breaks, and rest of at least 11 hours in any 24 hours; restricts excessive night work; and provides for a right to work no more than 48 hours per week.

- 5.6 With a large identified pool of under used labour in the local area, the impact of the job increases is expected to pose little additional burden on the provision of new public funded services and housing because most of these jobs are expected to be filled from residents already living locally.
- 5.7 There are approximately 200 businesses within the Nant Llesg study area, and they employ some 2,000 workers. The impact of the scheme is likely to add to local economic activity, and although there may be perception by some businesses that the scheme will have a negative visual impact on their location, the neighbouring Ffos-y-fran Land Reclamation Scheme site has been running similar activities to the Nant Llesg scheme for some years without any noted negative effects on local businesses. Indeed, all identified effects have been beneficial.
- 5.8 Overall, the economic impacts associated with job creation are assessed as having medium to major benefits in terms of sensitivity and magnitude, equating to a **major significance**. Likewise for the re-training and local economic activity impacts, these are assessed as having a medium sensitivity (local level impact) and major magnitude, giving a **moderate significance** to the benefits.

Summary of Economic Impacts

- 5.9 Nant Llesg is close to Miller Argent's current operational site, the Ffos-y-fran Land Reclamation Scheme (FLRS) in Merthyr Tydfil. The sites are of a similar nature and FLRS therefore provides a good demonstration of the type of economic opportunities that are likely to be generated. Based on this, the economic benefits of the Nant Llesg scheme would include:
- Direct employment: between 144 and 239 jobs (dependent on shift pattern);
 - Indirect employment: 118 jobs;
 - Induced employment (through employee spending): 25 jobs;
 - Average annual supplier expenditure on goods and services: £32.7m;
 - Average annual wages at Nant Llesg: c.£5m;
 - Total project wage bill: £70m;
 - Estimated total employee spending per annum: £2.38m;
 - Total project employee spend: £33.3m;
 - Miller Argent would work with local schools, colleges and training providers to raise awareness of job opportunities
 - Local unemployed residents would be sought to be part of the workforce where they have the skills to work efficiently and safely on site
 - Substantial and continuous training and professional development will be offered to staff through a planned increase in the number of in-house trainers and assessors
 - Local businesses will be made aware of contract opportunities from the project so that they can bid effectively for them.

Introduction

5.10 Miller Argent is preparing a planning application and ES for a scheme to recover in the region of 6 million tonnes of coal from the Nant Llesg Surface Mine. In addition to this, shorter term land remediation works are proposed on significant areas of land to the south and east of the surface mine. The scheme would cover approximately 479.1 hectares of land to the north and west of Fochriw and approximately ½ km west of Rhymney in the County Borough of Caerphilly.

5.11 The scheme and site workings would broadly entail:

- Erection of on-site offices, workshops, car parking, ancillary coal preparation plant and water treatment facilities;
- Erection of a visual and acoustic bund to the east and north of the excavation area;
- Surface mining excavations to recover a 6 million tonne coal reserve and the construction of a temporary overburden storage mound;
- Extraction and preparation of coal for dispatch to market;
- Progressive restoration;
- Backfilling of the final void with material from the overburden storage mound, restoration and aftercare of the land.

5.12 The recovery of this important coal reserve would also facilitate:

- the remediation of historic mining dereliction associated with the treatment of mining shafts and adits which will improve public amenity and create safe conditions for public access to extensive areas of land;
- restoration of land to open mountain grassland, interspersed with woodland belts and a substantial package of new paths as a public amenity;
- the improvement in the second worst mine water discharge in Wales which is unlikely to be rectified with public funds absent the scheme;
- the improvement in the run off of siltation to the lake in Darren Valley Country Park;
- the improvement of visibility along the southern approach to the junction of Bogey Road and Fochriw Road to improve highway safety;
- remediation and/or removal of waste from the MIS landfill;
- a superior restoration of an area previously subjected to former and somewhat pioneering 'opencast' mining - this is an important element of the social benefits of the scheme; and;
- the creation of areas of nature conservation (and geo diversity conservation) as part of the restoration scheme, together with substantial off site biodiversity benefits at the Bryn Careau area; and
- demonstrable employment and economic benefits associated with direct and indirect employment and the overall contribution to the local economy..

5.13 The scheme timetable covers some 19 years of investment, with the planned phases for the works being:

- Site establishment phase
 - Start on-site – year 1
 - Start of overburden excavation - midyear 1
- Operational phase
 - Start of coaling - year 2
 - End of coaling - year 11
 - End of restoration - year 14
- After-care phase
 - End of minimum 5 year aftercare period - year 19

Scope of the Assessment

5.14 This chapter outlines the approach, coverage and method used to assess the socio-economic impact of the proposed scheme. Specifically, considerations are given to the economic impacts generated by the Nant Llesg scheme on residents and businesses in the local area, which is defined in paragraph 5.15. This includes the changes in local labour and any impact that this might have on housing and other community infrastructure. References are also made to separate social impact assessments relating to the effects on resident's health, resident's local recreation and tourism, common land, and also the national economy. Further information on these impacts is provided in the following studies:

- Health - in the Health Impact Assessment (HIA), prepared by RPS, which is a required separate assessment to accompany the scheme application
- Recreation and tourism – found in Chapter 6 of this ES
- Common land – found in Chapter 9 of this ES
- National economy – referred to in the Need Case for the Nant Llesg Scheme, prepared by Quod and included within Chapter 14 of the Planning Statement.

5.15 The assessment identifies the type and level of impacts likely to affect the key receptor groups in socio-economic terms. Baseline information about the local area has been collated from secondary data sources. For this purpose, the local area is identified by the seven Lower Super Output Areas (LSOAs⁴) within Caerphilly, covering and surrounding the Nant Llesg scheme, as

⁴ Lower Super Output Area (LSOAs) are units of geographic boundary developed by the Office of National Statistics; and these are aggregations of Output Areas. Output Areas are subdivisions of 2003 wards and each contains approximately 125 households (300 residents). LSOAs are the next largest area up and each contain a minimum population of 1,000 persons and on average (mean) contain a population of 1,500 persons. The study area LSOAs have been identified on Figure 5.1.

identified as the green area in the first map in Figure 5.1. The second map in Figure 5.1 shows the study area in the context of the local authorities covering and surrounding the Nant Llesg scheme. To assess the economic impacts on the local economy, primary data sources such as questionnaires have been used. For this purpose the local economy is defined as being within 10 miles of the Nant Llesg site, as shown on the map. Jobs are considered to be local up to 10 miles from the Nant Llesg site centre because these jobs will be geographically accessible to key receptor groups within this area.

- 1.1 The socio-economic effects from the scheme are considered over three phases: the site establishment phase, which will be short-term; the main operational phase, including coal working and restoration of the land, which is anticipated to last for 14 years; and the aftercare phase that continues for a minimum of 5 years following the restoration of the land. Impacts will include job creation and the changes in the economic structure and profile of the local labour market (supply and demand) to identify any impact on local conditions, including housing and community facilities.

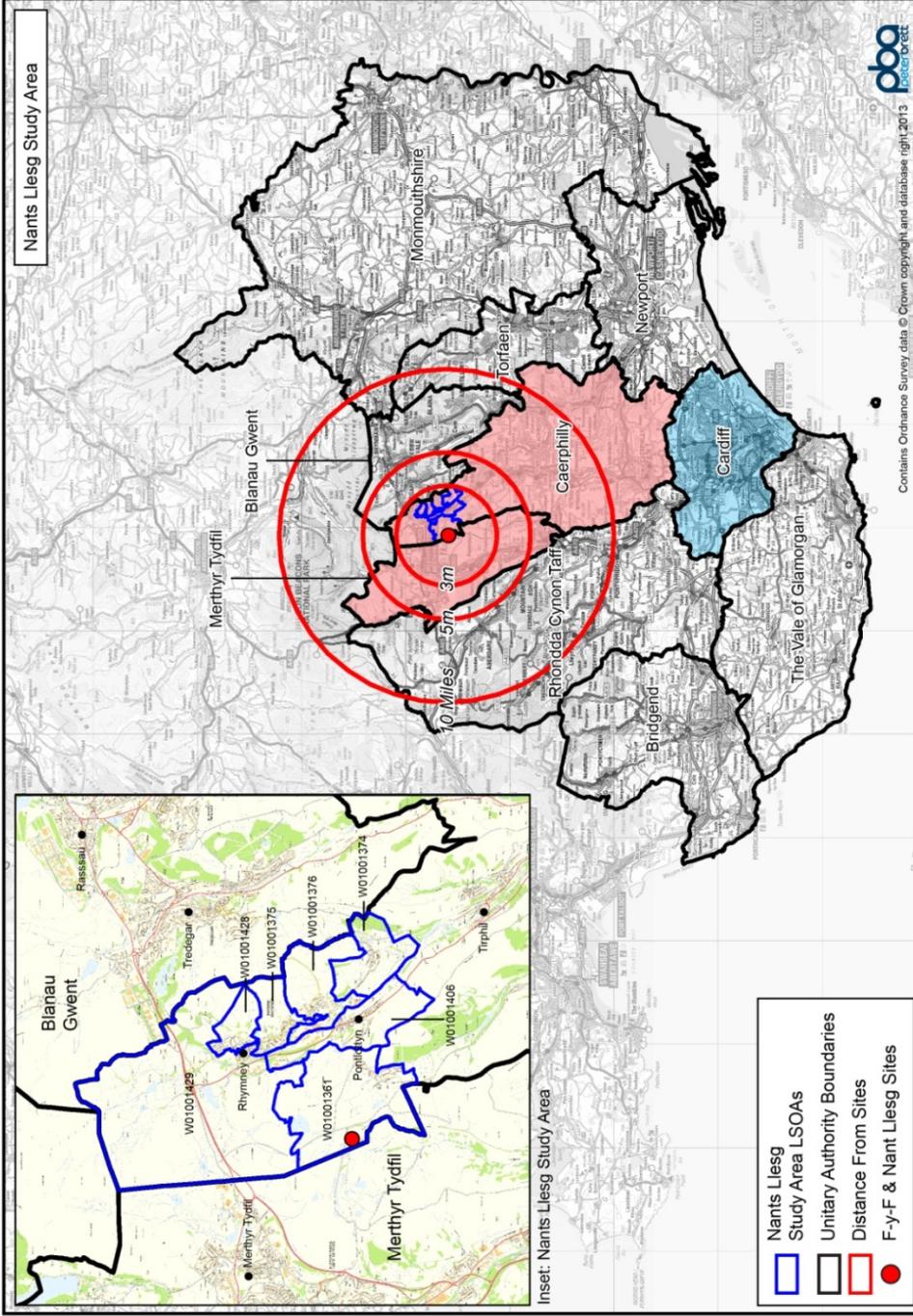
Methodology

- 5.16 This assessment is guided by HM Treasury's 'Green Book', which sets out the standard approach to undertaking economic impact assessment. The assessment has been carried out in two stages:

i. Baseline Assessment

- 5.17 The baseline assessment is two-fold. Firstly, economic development and employment policies have been reviewed at the local, regional and national policy context relevant to this project to highlight the key strategic objectives to which the project may contribute. Rather than describing baseline conditions, this element considers the current aspirations for maintaining or changing baseline conditions.
- 5.18 Secondly, the area's socio-economic baseline examines the size, depth and performance of the local economy to gauge the level of impact and change that might be absorbed from the Nant Llesg scheme. The local labour market is also considered in terms of unemployment, economic activity, skills and commuting patterns to help identify how the impacts from the additional jobs associated with the Nant Llesg scheme might change the current baseline.
- 5.19 The analysis has largely reviewed a mix of secondary data sources from the Office of National Statistics (ONS), including the Annual Business Inquiry (ABI), Business Register and Employment Survey (BRES), Annual Population Survey (APS) and Census (2001 and 2011).
- 5.20 Where available and appropriate, the baseline conditions are presented in relation to the aggregated data from the seven Lower Super Output Areas (LSOAs) that cover the immediate vicinity of the Nant Llesg scheme (as shown in Figure 5.1), and the County Boroughs of Caerphilly and Merthyr Tydfil. The comparator of Wales is used throughout. A comparator of South East Wales (excluding Cardiff) is also used. For the purposes of this comparator, South East Wales is taken to cover Bridgend, Vale of Glamorgan, Rhondda Cynon Taf, Merthyr Tydfil, Caerphilly, Blaenau Gwent, Torfaen, Monmouthshire and Newport local authority areas, unless where stated otherwise. Figure 5.1 above identifies the geographic areas for statistics on baseline conditions.

Figure 5.1: The Study Area



ii. Social and Economic Impacts

5.21 The economic impacts of the Nant Llesg scheme are primarily measured through the number and type of jobs generated by the scheme since these estimates provide the best local indicator of socio-economic impact. This includes the potential for new jobs on-site covering the three phases of site establishment, operation and restoration, and aftercare sourced from Miller Argent's Planning Statement. In addition, consideration was given to the potential for creating and supporting jobs in the wider economy through:

- Indirect impacts with off-site employment created by the suppliers because of the new activity generated by the project. To calculate this, Miller Argent provided a list of its current suppliers by type of spending and value, and supplier location for the last three years (2009 - 2011 covering over 16,000 transactions) at the existing Ffos-y-fran Land Reclamation Scheme (FLRS). The scale and pattern of supplier spending at Nant Llesg is projected to be similar. From this real life example, the spending can be converted into jobs supported using turnover per job taken from the ONS Annual Business Survey national extract data.
- Further induced multiplier impacts in the economy are generated by on-site workers spending their earned income. To estimate the induced spending by on-site workers, a survey of 25 personnel working at the FLRS was carried out. Since the new jobs at Nant Llesg will mirror the occupational characteristics and earnings at FLRS, this provided useful real data. The survey results were then re-weighted and extrapolated to provide a total on-site employee spend by sector in the local economy. This induced spending was converted into supported jobs using the Econ-IA model.

5.22 The above assessment provided an estimate of the gross impacts of the Nant Llesg scheme. The next step involved determining the proportion of the gross impacts which would be net additional impacts in the study area. For the economic impact assessment, the local economy of the study area is defined as being within a 10 mile radius of the Nant Llesg site, so that any jobs supported within this area would be accessible to the Nant Llesg study area population. This is done by applying discounts to the gross impacts to allow for:

- Leakage, since not all jobs are likely to be filled by residents within the Nant Llesg study area.
- Deadweight, where the scheme's jobs would likely have been secured in the absence of the scheme going ahead.
- Displacement, should any of the jobs created replace/substitute existing jobs within the study area.

5.23 The economic impacts covered in this section are assessed against the Planning Policy chapter of the Planning Statement, and measured on scale (magnitude) and significance (sensitivity) as discussed below, to form a conclusion on the significance of the impacts.

Significance Criteria

5.24 There are no easily applicable socio-economic standards against which the predicted effects of a development can be assessed. Taking this into account, and to establish a framework which enables informed discussion of the potential socio-economic effects of the Nant Llesg scheme, a set of thresholds for key effect types have been developed and applied during the assessment process. These are considered in terms of:

- **Magnitude** – this considers the absolute number of residents affected and the relative scale of the effect in the local context of employment and training opportunities. Magnitude is also informed by impact duration for which the following definitions are applied:
 - **Short Term:** A period of months, up to one year;
 - **Medium Term:** A period of more than one year, up to five years;
 - **Long Term:** A period of greater than five years but not beyond the lifetime of the project;
 - **Permanent:** A period beyond the lifetime of the project
- **Sensitivity** – likely significant socio-economic impacts within the study area have been assessed by reference to the baseline conditions of unemployment and deprivation. High levels of unemployment and deprivation are sensitive to increases in employment and training opportunities. Low levels of unemployment and deprivation are less sensitive to increases in such opportunities.

5.25 Table 5.1 provides a breakdown of the criteria and thresholds that have been used in assessing significance. This principally covers the net jobs supported, but also takes account of any training to enhance local skills and local recruitment. As previously noted in paragraph 5.14, the significance of other social impacts covering health, recreation and tourism, and the national economy are dealt with elsewhere within the ES.

Table 5.1 Assessment Thresholds for determining Magnitude and Sensitivity of Impacts

Type of effect		Magnitude of change in employment level in the local economy			
		No change	More than + or - 2% change	More than + or - 2-5% change	More than + or - 5% change
Sensitivity of jobs in areas with relative employment deprivation (as measured by the Wales Index of Multiple Deprivation 2011)	Areas ranked in the 50% least employment deprived areas in Wales	Negligible	Minor	Minor	Moderate
	Areas ranked in the worst 50% of employment deprived areas in Wales	Negligible	Minor	Moderate	Major
	Areas ranked in the worst 20% of employment deprived areas in Wales	Negligible	Moderate	Moderate	Major
	Areas ranked in the worst 10% of employment deprived areas in Wales	Negligible	Moderate	Moderate	Major

Type of effect		Magnitude of changes in local training/retraining opportunities			
		No change in the local training	25%+ of new jobs with 40+ training days	50%+ of new jobs with 40+ training days	75%+ of new jobs with 40+ training days
Sensitivity of training in areas with relative education deprivation (as measured by the Wales Index of Multiple Deprivation 2011)	Areas ranked in the 50% least employment deprived areas in Wales	Negligible	Minor	Minor	Moderate
	Areas ranked in the worst 50% of employment deprived areas in Wales	Negligible	Minor	Moderate	Major
	Areas ranked in the worst 20% of employment deprived areas in Wales	Negligible	Moderate	Moderate	Major
	Areas ranked in the worst 10% of employment deprived areas in Wales	Negligible	Moderate	Moderate	Major

Limitations and Assumptions

- 5.26 It is important to note that the quantified effects can only ever be estimates of the future, and are in their very nature dependent on a range of variables, including market conditions and delivery. But they are based on professional judgement and expertise in assessing economic impacts.
- 5.27 While useful data on potential employee local spending (induced impacts) was collected through a robust method of surveying employees at the neighbouring FLRS, the survey responses were not significant. Nonetheless the collected information does provide a useful approximate guide for the likely induced impacts of the Nant Llesg scheme, which is preferable to the ready reckoner approach (using evidence from other locations or industries) which is sometimes used in other assessments.

Policy Context

Planning Policy Wales (Edition 5, November 2012) (PPW)

- 5.28 As detailed in Chapter 19 of this ES, PPW sets out the land use planning policies of the Welsh Government, supplemented by a series of Technical Advice Notes (TAN). However PPW does not set out detailed practical guidance for many important aspects of land use, such as how to decide how much support should be provided to the economy through land provision. None of

the TAN are currently specifically relevant to employment provision. While this is expected to change soon, it will not be before the submission of this ES⁵.

5.29 Chapter 7 of PPW – Economic Development was recently revised to align the planning policy of economic development more closely with the Welsh Government’s broader economic policies and to try to ensure that the planning system in Wales facilitates economic renewal more effectively. This includes making provision for, and considering the needs of, the entire economy and delivering physical regeneration and employment opportunities to disadvantaged communities by prioritising sites that deliver appropriate job and training opportunities to disadvantaged communities.

5.30 Importantly, PPW Chapter 7 stresses the need for using evidence for setting an economic vision, and guides development plans to include encouraging the regeneration and re-use of sites which are still suitable and needed for employment and to provide the right amount of land and qualitative mix of sites to meet the market demand for economic development uses.

5.31 Of particular relevance to this chapter, is paragraph 7.2.3 in PPW, which states that...

“Local planning authorities are required to ensure that the economic benefits associated with a proposed development are understood and that these are given equal consideration with social and environmental issues in the decision-making process, and should recognise that there will be occasions when the economic benefits will outweigh social and environmental considerations.”

5.32 The facilitation of economic development should also operate across County borders by authorities working strategically and co-operatively in steering development and investment to the most efficient and most sustainable locations, irrespective of whether residents are travelling to work across borders.

5.33 The Welsh Assembly Government also remains committed to building a modern economy with a broader economic base that provides job opportunities for all and supports the greater use of modern technology in redressing problems relating to access and remoteness. This now includes promoting the low carbon economy, business and technology clusters and social enterprises.

Wales Spatial Plan (WSP)

5.34 The Wales Spatial Plan, ‘People, Places, Futures’, was first adopted in 2004 by the Welsh Assembly Government and updated in 2008. It sets out that development should be sustainable; by which it means it should have considered its environmental, economic and social objectives in the context of more efficient use of natural resources. It sets out cross cutting national spatial themes and identifies six area sub regions across Wales, of which South East Wales is one (with Caerphilly County Borough in which Nant Llesg is situated, and the immediately adjacent Merthyr Tydfil being part of the South East Wales sub region).

5.35 The 2008 Update of the WSP identifies that one of its key roles (derived from ‘One Wales’ One Planet’, the sustainable development scheme for the Welsh Assembly Government) is that it should ‘adopt an all-Wales approach to economic development, guaranteeing investment in all regions within the framework of the Wales Spatial Plan’. Challenges to achieving this economic development approach are seen as including collaborative working across organisations related

⁵ Roger Tym & Partners are in the processing of finalising the guidance, and a draft report has been submitted to the Welsh Government at the time of preparing this ES.

to jobs, health and skills development in order to achieve a long term target of 80% of working age people in employment.

- 5.36 In the context of the South East Wales sub region, discussion of the ‘promoting a sustainable economy’ theme identifies that any major private sector employment development is likely to be focused in the south of the sub region; with public sector strategic interventions focused on the mid and upper valleys of the sub region such as the Heads of the Valleys Regeneration Programme⁶, which covers the area where the Nant Llesg scheme is being promoted.

South East Wales Economic Forum

- 5.37 The South East Wales Economic Forum⁷ (SEWEF) set out a 10 year economic strategy in 2005 with a vision of South East Wales as ‘a region on the way to becoming one of the most prosperous in Europe, providing opportunities for every individual, enterprise and community to share in that prosperity’.
- 5.38 A five year review of the strategy in 2010 suggested that little progress had been made towards this vision based on prosperity measures. Whilst South East Wales is the best performing region in Wales the review noted that South East Wales as a whole had fallen further below the UK average on various indicators (e.g. GVA per capita) since 2005. The impact of the recession is noted as having adversely impacted on achievement of the vision, which was built on a view that development in the Valleys would be driven by the economic strength of the coastal belt and facilitated by connections between the two.

Caerphilly Local Development Plan

- 5.39 As detailed in Chapter 19 of this ES, the Caerphilly Local Development Plan (adopted November 2010) includes a strategy for the regeneration of the Heads of the Valleys, an area which includes the Nant Llesg site.
- 5.40 In the Heads of the Valleys Regeneration Area (HOVRA) there is only one employment allocation (5.2 hectares at the Heads of the Valley industrial estate, Policy EM1.1). The emphasis is on redevelopment and regeneration of existing allocated employment sites, to make them more attractive to inward investors (Policy EM2 applying to the Heads of the Valley, Capital Valleys and Maerdy industrial estates at Rhymney).
- 5.41 Area specific policy supporting text for the HOVRA identifies Rhymney as the local centre for the Heads of the Valleys area and with potential to grow a tourism role as a gateway into the County Borough from the Heads of the Valleys area whilst also building on its rural environment tourism and recreation offer. It also discusses the significant amount of employment land that Rhymney has on existing industrial estates and the opportunity for this to be used for alternative employment uses given changing employment land requirements (although without identifying what these alternative employment uses might be).

⁶ ‘Turning Heads’ a Strategy for the Heads of the Valleys to 2020, published 2006. A ‘vibrant economic landscape offering new opportunities’ is one of its five priority themes with a goal for access to a more diverse range of business and employment opportunities and greater levels of innovation and entrepreneurship. An ‘appealing and coherent tourism and leisure experience’ is also a priority theme, in which the Valleys Regional Park fits.

⁷ Comprising 10 local authorities including Caerphilly and Merthyr Tydfil County Borough Councils, Welsh Assembly Government, private sector, third sector and university partners.

5.42 Caerphilly also published a revised regeneration strategy in 2010⁸. This highlighted the relative dependency of the local economy on manufacturing and public sector employment, now affected by the recession. The regeneration strategy vision is to 'work with partners to create a sustainable and diverse economy through developing and building upon the strengths of our people, businesses and places'. Activity areas to take forward the strategy vision and its three themes of people, places and businesses include increasing economic activity and addressing worklessness (i.e. this is likely to include the unemployed plus working age residents who have dropped out of the labour market for different reasons); protecting and developing the economy; promoting lifelong learning and improving basic skills; and regenerating communities and raising aspirations.

Need for Coal

5.43 Chapter 15 of the Planning Statement sets out the principal need case for the coal from Nant Llesg.

5.44 The Need Case presents evidence that for the last decade coal imports to the UK have exceeded UK coal production and now represent around 60% of supply. The UK demand for coal remains strong and future predicted demand indicates that this will continue for the period that FLRS and Nant Llesg schemes are proposed to be working. Conversely existing and other consented reserves in the UK are predicted to be depleted before 2020.

5.45 This evidence strongly supports the need for the indigenous production of coal and therefore for the Nant Llesg scheme. This has been reflected in two letters of support from potential users of Nant Llesg, TATA Steel and RWE, which can be found at Appendices MA/NL/PA/A009 and MA/NL/PA/A010 to the Planning Statement for the Nant Llesg scheme.

Socio Economic Baseline Conditions

Population

5.46 According to the latest Census (2011) results, some 10,100 people are residing in the Nant Llesg study area, as identified by the seven Lower Super Output Areas (LSOAs) in Figure 5.1 above which cover the immediate vicinity of the Nant Llesg scheme. The 2012 population estimates indicate that Caerphilly and the Nant Llesg study area have a slightly younger age profile than Wales, as shown in Table 12 of Appendix MA/NL/ES/A05/002.

5.47 To set the context, Table 1 of Appendix MA/NL/ES/A05/002 compares the latest Census (2011) data against 2001 data. Caerphilly County Borough's population increased by 2.6% between 2001 and 2012 whereas the Nant Llesg study area grew by about 0.4%. By comparison the population of the rest of South East Wales (excl Cardiff) grew by some 4% and Wales by 5.5%. Cardiff grew by 13% over that same period.

5.48 Table 13 of Appendix MA/NL/ES/A05/002 shows population projections to 2030 which indicate that the rate of growth for the Nant Llesg study area and Caerphilly are considerably lower (less than 50%) than that predicted for Wales as a whole.

⁸ Called 'People, Business, Places A Regeneration Strategy for Caerphilly County Borough'2010.

Labour Market

- 5.49 Official (ONS) data prepared in 2010, which is not available for the local area, shows the working age population (aged 16-64) of Caerphilly⁹ to be 110,200 or 63.7% of the population. In Merthyr Tydfil, the working age population was 35,500, also 63.7% of the total population. This is very much in line with the Wales figure of 63.2%. There is little variation in the percentage of male or female working age populations of the two local authorities – the male rate is less than 0.5% above 63.7% and the female rate 0.5% or less below this average.
- 5.50 Based on Census data shown in Table 12 of Appendix MA/NL/ES/A05/002, the defined Nant Llesg study area had a working age population of about 6,500, or 64% of the total population, which was 1% point higher representation than the national (Wales) average. The Nant Llesg local area should therefore have a sustainable demographic structure, since it has more working age residents who should be able to better support the dependent population (children and retired). However, this is not borne out by the local rate and types of economic activity, which we consider next.
- 5.51 As shown in Table 2 of Appendix MA/NL/ES/A05/002, the proportion of working age residents who are economically active in Nant Llesg, and across both Caerphilly and Merthyr Tydfil, are below the Wales average. The Nant Llesg study area has an overall economic activity rate of just 57%, Caerphilly 65% and Merthyr 64% compared to 72.6% in Wales. By comparison the rest of South East Wales (excluding Cardiff) and Cardiff have higher economic activity rates of 65% and 67% respectively.
- 5.52 What is particularly pertinent to the Nant Llesg Scheme proposal is the male economic activity rate, which shows that the proportion of economically active men in employment is 75.8% in Caerphilly and 78% in Merthyr, compared to 77.9% in Wales. Conversely the unemployment rate amongst economically active men is higher at 13.8% in Caerphilly and 13.4% in Merthyr, compared to 10.1% in Wales. This indicates the lack of jobs and the need for more employment opportunities in Caerphilly and Merthyr particularly targeting younger men.
- 5.53 It is also valuable to look at trends in economic activity rates over time; however this was only available at the County Borough and national level. Figure 1 of Appendix MA/NL/ES/A05/002 shows economic activity rates from 2004 – 2010. This shows that both Merthyr Tydfil and Caerphilly are consistently below the Wales average, South East Wales average and Cardiff average (with the exception of 2009 in Merthyr Tydfil).
- 5.54 Self-employment is indicated as part of economic activity rates and the data shows that rates in both Caerphilly and Merthyr are well below both the Wales rate. Table 2 of Appendix MA/NL/ES/A05/002 shows that self-employment was at 8.5% in Caerphilly and 10.2% in Merthyr in 2010/11 compared to 12.3% in Wales. Dependence on employment through employee status is therefore high.
- 5.55 The 2011 Census data identifies that only 8.7% of working residents in shows the Nant Llesg study area were self-employed. These figures indicate that the local area is performing below the national norm for economic activity, with a heavy reliance on employment and less so on enterprise.
- 5.56 Unemployment as indicated by Job Seekers Allowance claimants shows above average unemployment levels at 5.7% in Caerphilly and 4.8% in Merthyr, compared to 4.5% in Wales as

⁹ References throughout to Caerphilly and Merthyr Tydfil are taken to mean to the County Borough in all cases unless explicitly stated otherwise. Data source: mid-year population estimates, ONS.

at February 2012. The claimant count for the Nant Llesg study area is even higher at 9% (equivalent to around 567 people of which 66% are male). Figure 2 of Appendix MA/NL/ES/A05/002 indicates trends in claimant counts since 2005¹⁰. The Nant Llesg study area is shown as having a continually higher than average claimant count rate in benchmark areas.

- 5.57 The split of unemployment by gender indicates that male unemployment is consistently higher than female unemployment, as Figure 3 of Appendix MA/NL/ES/A05/002 indicates.
- 5.58 Claimant levels are particularly acute amongst young people aged under 25, which account for more than half of all Job Seekers Allowance claimants in Caerphilly and Merthyr Tydfil, rising to nearly 56% in the Nant Llesg study area, as shown in Table 3 of Appendix MA/NL/ES/A05/002. In the comparator areas of South East Wales, Cardiff and Wales claimant count figures for under 25 year olds range from 47% to 50%.
- 5.59 Duration of unemployment is also relevant. In February 2012 over 50% of JSA claimants in Caerphilly and Merthyr Tydfil had been registered as unemployed for 6 months or less, and 44%-48% were in longer term unemployment, as Table 4 of Appendix MA/NL/ES/A05/002 indicates. A fifth were registered as long term unemployed (for 12 months or more) in both these areas. The issue is more acute in the Nant Llesg study area where 49% of claimants have been unemployed for 6 months or more and over 22% for 12 months or more.
- 5.60 Claimant Count data also provides useful information on both the usual occupation of claimants and their sought occupation. Table 5 of Appendix MA/NL/ES/A05/002 shows occupations sought by claimants as of February 2012 and indicates that 'elementary occupations', 'process plant and machinery operatives', and 'sales/service occupations' are the three categories most sought in almost all areas. Caerphilly, Merthyr and the Nant Llesg study areas all have higher levels of jobs sought in 'process, plant and machinery operatives' (18%-21%) than their comparators (8%-15%).
- 5.61 Figure 4 of Appendix MA/NL/ES/A05/002 looks in more detail at usual occupations versus jobs sought for the Nant Llesg study area (February 2012). This shows a relatively strong correlation between the two, which is also reflected in the two local authorities and the comparators more broadly.
- 5.62 The proportion of the population with the highest qualifications (2011) in the Nant Llesg study area is well below the benchmark averages, including compared with Caerphilly, Merthyr and Wales averages. There are far fewer people with qualifications at Level 4+ and correspondingly more with no qualifications, as Figure 5 of Appendix MA/NL/ES/A05/002 indicates. This sits alongside employment by occupation which indicates a lower proportion of employed people in managerial/professional occupations and a higher proportion in process plant/machinery/elementary occupations compared with both Caerphilly and Merthyr, and with Wales (see Table 6 of Appendix MA/NL/ES/A05/002).
- 5.63 As shown in Table 8 of Appendix MA/NL/ES/A05/002, average median earnings (2011) of full time residents in employment in Caerphilly are the same, at £460 per week as that for Wales, with male earnings higher than for Wales. However gross weekly earnings for residents in Merthyr are slightly lower at £433. Earnings by workplace (2011) though show a greater gap between County

¹⁰ NOMIS does not supply rates for LSOA level geography, just raw counts. Data from the 2010 Mid-Year Pop Estimates for LSOAs has been taken for the 16-64 age groups (M/F & Total) to calculate claimant count rates at the Nant Llesg geographic area. At local authority level, 2005 – 2010 rates are based on % 2006 mid-year population estimates for 16-64 year olds; 2011- 2012 rates are based on 2010 mid-year population estimates.

Boroughs and Wales comparators. In Caerphilly average gross weekly earnings by workplace are only £437 and £407 in Merthyr compared to £451 on average in Wales. This would suggest that higher earning residents are travelling out of the Boroughs to work. Indications from 2008 data available at MSOA level are that income levels are likely to be even lower in the Nant Llesg study area; see Table 9 of Appendix MA/NL/ES/A05/002. Average weekly income was £430 in Nant Llesg compared to £525 and £490 in Caerphilly and Merthyr Tydfil respectively. Note that the datasets in Tables 8 and 9 of Appendix MA/NL/ES/A05/002 are not comparable as one is for individual earnings and one is for household earnings.

The Workplace Economy

- 5.64 According to the latest (2010) available official data, the Nant Llesg study area economy has some 200 business and some 2,000 employee jobs¹¹. Based on Census 2001 results, there were some 6,270 working aged residents and 3,570 economically active residents in this area, so there has been an imbalance in employment places for local residents, and little seems to have changed since 2001 to have rebalanced this. A similar picture is apparent in Caerphilly and Merthyr Tydfil with both having fewer jobs compared to working aged and economically active residents. More jobs in these areas would therefore be welcomed on the grounds of improving local prosperity and sustainability with assumed shorter distances that residents would travel to work.
- 5.65 Levels of commuting suggest that there are lower levels of self-containment in Caerphilly and Merthyr counties than for South East Wales and Wales more generally as Table 7 of Appendix MA/NL/ES/A05/002 indicates. Caerphilly in particular shows a significant level of out commuting to work by residents and self-containment (53%) well below the Wales average (71%). Its self-containment level has declined by only 2% since 2001. Availability of local jobs could help residents in Caerphilly County live and work in the same area.
- 5.66 The employment structure (2010¹²) of Caerphilly and the Nant Llesg study area shows the Mining and quarrying sector accounts for just 2% of employment in Caerphilly, which is a higher representation compared with the Wales average of 1.5%. With the FLRS, the Nant Llesg study area has well above average activity in Mining and quarrying, in addition to higher than Wales average employment in the wholesale (9.5%, 190 employees) and transport & storage sectors (12.2%, 246 employees). Table 10 of Appendix MA/NL/ES/A05/002 sets out employment by sector for 2010.
- 5.67 Manufacturing is the employment sector which is very significantly over-represented compared to a Wales comparator – 22.4% in the Nant Llesg study area and 19.9% in Caerphilly as compared to 10.3% in Wales. Despite manufacturing being a major employment sector in both Caerphilly and Merthyr, data available from BRES over the three years 2008 – 2010 shows that it has declined by around 20% as an employment sector in that time period, in line with the decline in Wales overall (see Table 11 of Appendix MA/NL/ES/A05/002). However the decline has been less in the Nant Llesg study area (-10.2%). Other sectors which have declined by more than 20% in the same period include (in Caerphilly) education (-27.3%); and in Merthyr, professional technical and scientific services (-35.5%). In Nant Llesg retail and education have declined by -27.7% and -36.7% respectively; public administration and defence has decline by -41.7%. Conversely some sectors have increased in employment terms.

¹¹ Based on the latest (2010) ABI and BRES data. This data source does not include self-employed, HM Forces or Agricultural farm workers (below GOR areas) so it will under-count workforce jobs.

¹² Ibid.

- 5.68 The largest increase in employment in the Nant Llesg study area was seen in information and communication which increased by 300%, although this is from a very small base and, as in Caerphilly, this sector is still comparatively under represented.

Local Deprivation

- 5.69 The Welsh Index of Multiple Deprivation 2011 ranks all Lower Super Output Areas according to a combination of eight indicators (domains) encompassing: income; employment; health; education, community safety; housing, geographical access to services and physical environment. These eight indicators are then weighted and aggregated into summary measures of deprivation.
- 5.70 Table 14 of Appendix MA/NL/ES/A05/002 sets out the extent of deprivation by local authority area and in the Nant Llesg study area in particular, based on Lower Super Output Areas (LSOAs). This shows the Nant Llesg study area to have levels of deprivation well above those of local authorities in South East Wales in terms of percentage of LSOAs having highest levels of deprivation. This includes 43% of LSOAs being within the most deprived 10% of LSOAs in Wales, and all the LSOAs being the 30% most deprived nationally. Of the eight domains making up the IMD, the employment and health domains perform particularly poorly across the seven LSOAs in the Nant Llesg study area.

Local Employment and Education Deprivation

- 5.71 Table 15 of Appendix MA/NL/ES/A05/002 identifies the Nant Llesg study area's performances in each of the eight deprivation domains informing the multiple deprivation index.
- 5.72 The employment domain is particularly important in the context of this chapter, since it is one of the factors which will influence the sensitivity to social economy impact created by the Nant Llesg scheme, as described in Table 5.1 in this chapter. As Table 15 of Appendix MA/NL/ES/A05/002 shows, the most common deprivation in the Nant Llesg study area is in the employment domain where 5 of the 7 LSOAs are identified in the most deprived 10% of LSOAs in Wales. The other two LSOAs are within the most deprived 20% of LSOAs in Wales.
- 5.73 The other important domain is education deprivation. In the Nant Llesg study area, 3 of the 7 LSOAs are identified to be within the most educationally deprived LSOAs in Wales. One is within the most deprived 20%, while the other three are all within the 30% most educationally deprived areas in Wales.

Housing Requirements

- 5.74 The population of Caerphilly has experienced change, with a loss of population in the Rhymney Valley, falling by 8% between the 1991 and 2001 Census and an increase in the Caerphilly Basin of 4%. The total population of 170,000 is expected to grow to 177,500 in 2021 and this increase is expected to come from in-migration. Caerphilly Borough Council has identified a need for 8,625 dwellings and has allocated land to meet this. In the neighbouring county, Merthyr Tydfil is planning for around 3,800 new houses over the Development Plan period to 2021 to meet additional demand, including the additional projected population growth of 4,300.
- 5.75 A number of the Caerphilly Council's housing land allocations are in the Heads of the Valley Regeneration Area, including the settlements of Rhymney, Aberbargoed, Bargoed, Abertysswg, New Tredegar, Pontlottyn, contributing 1,628 dwellings.

- 5.76 While there is a need for affordable housing in Caerphilly, the latest (2007) Local Housing Market Assessment¹³ found that there was a surplus of affordable housing supply in the northern part of the County Borough, whereas demand was highest in the mid and southern areas where it was outstripping supply. This surplus is partly due to the lower value and therefore more affordable, open market housing in the Heads of the Valleys area.
- 5.77 A new primary school is planned for Rhymney and an extension to Aberbargoed Primary School is planned which will meet the needs of the population growth and will be funded through new development.

Health

- 5.78 A Health Impact Assessment (HIA) prepared by RPS on behalf of Miller Argent, has been undertaken to investigate and address the potential health impact of the proposed Nant Llesg scheme. The HIA sets out the baseline health conditions of Caerphilly, Merthyr Tydfil and Wales; it also includes the comparator area of Blaenau Gwent the other local authority adjacent of Caerphilly. A summary of the baseline health conditions for Caerphilly and the comparator areas are set out below:
- Overall health within Wales improved during 2001 to 2009 with a gradual decline in the all age all-cause mortality rate. In 2009, Caerphilly ranked 14 out of 22 local authorities in Wales, where 1 has the lowest all age all-cause mortality rate. Merthyr Tydfil and Blaenau Gwent have some of the worst health in Wales.
 - Life expectancy within Caerphilly in 2008-10 was marginally below the average life expectancy at birth across Wales. Merthyr Tydfil and Blaenau Gwent have the lowest life expectancy in Wales for males and females respectively.
 - Access to health services is good in the local authority areas¹⁴ covered by the Aneurin Bevan Health Board, established in 2009, which encompasses three A&E hospitals, two acute care hospitals, five community hospitals and five hospitals for psychiatric care. The average GP list size in the Aneurin Bevan Health Board is slightly lower than the Wales average.
 - In terms of crime and anti-social behaviour, statistics for 2010-11 taken from Her Majesty's Inspector of Constabulary crime and policing comparator show Gwent (the police force for Rhymney) to be the 6th worst out of the 43 forces in England and Wales measured by the number of crimes per 1,000 population. Particularly high crime levels were recorded for vehicle crime, criminal damage, and incidents of anti-social behaviour. Crime can be correlated with poverty, which might be the causal link within this area given the high levels of local deprivation and low levels of economic activity.

Tourism and Recreation

- 5.79 Chapter 6 of this ES sets out in detail the baseline conditions with respect to recreation and tourism and describes the area of common land and public rights of way in the vicinity of the Nant Llesg scheme. In addition it sets out the recreational facilities outside of the site area such as the Brecon Beacons National Park, Parc Cwm Darran and Bute Town Reservoir. The Brecon

¹³ Fordham Research (2007), Local Housing Market Assessment, for Caerphilly County Borough Council.

¹⁴ Covers the areas of Blaenau Gwent, Caerphilly, Monmouthshire, Newport, Torfaen and South Powys.

Beacons National Park is also a key tourism attraction in the area. Other local tourism resources include, Butetown, Winding House New Tredegar and Parc Bryn Bach.

Assessment of Impacts

Economic Impacts

- 5.80 The following section sets out the potential impact of the Nant Llesg scheme on the local economy. This assessment uses an economic model approach to considering the gross direct, indirect and induced equivalent jobs generated by the scheme as described in the earlier Methodology section.
- 5.81 **Direct impacts** relate to the jobs employed at the Nant Llesg site. The direct employment associated with the development covers management and operations (principally construction and mining) jobs which are employed by Miller Argent. There will also be a number of additional supplier contractors working on site, which form part of the indirect jobs calculation. The latter jobs differ from the jobs directly employed by Miller Argent only through being contracted to work on-site for Miller Argent by one of its suppliers. For the purpose of calculating jobs on site, we quantify these jobs here.
- 5.82 The Planning Statement for the scheme prepared by Miller Argent identifies weekday working times of 0700 to 1900 hours (Monday to Friday) and 0700 to 1400 hours on Saturdays. During this time, it is anticipated that there will be an average of 144 to 239 employees working on site depending on whether a one shift or split shift working time practice is adopted. The shift pattern adopted depends on the current status of the Working Time Directive which restricts the hours a person can work in a week. Either way, the labour costs to Miller Argent and investment in the local area are likely to remain the same since either shift pattern will generate the same output, but the one shift pattern will provide workers with a higher remuneration because of the greater number of worked hours (including overtime) per employee. Overall, the average weekly wage bill is estimated by Miller Argent to cost £96,000, which is approximately £5m per year and £70m over the life of the project.

Table 5.2 Average Employment over the Nant Llesg Scheme based on a One and Split Shift Working Pattern

	All 14 Years' Average (excluding aftercare)
Split shift - all jobs on site	239
One Shift - all jobs on site	144

- 5.83 For the purpose of assessing local impact we use both the one and split shift patterns to provide a range of the average number of jobs at any point in time. However, over time the number of jobs will fluctuate to reflect the different phases and works' requirements of the Nant Llesg scheme. The phasing of the maximum job numbers is shown by year for both a one and split shift patterns in Table 5.3.

Table 5.3 Nant Llesg Scheme, Employment Over Time based on a One and Split Shift Working Pattern

	Jobs on-site	Average for phase	Jobs on-site	Average for phase	Working phase
	One Shift		Split shift		
YR1 1st Half	79	79	79	79	Site Establishment
YR1 2nd Half	176	158	272	266	Production
YR2	164		277		
YR3	158		271		
YR4	158		271		
YR5	158		271		
YR6	158		271		
YR7	150		255		
YR8	150		255		
YR9	149		253		
YR10	160		265		
YR11	160		265		
YR12	112	108	182	171	Restoration
YR13	116		186		
YR14	96		146		
YR15-19	10	10	10	10	Aftercare

Source: Data from Miller Argent - Latest Version - 26/03/13

Note: Years 15-19 are for aftercare only and have not been used in Table 5.2

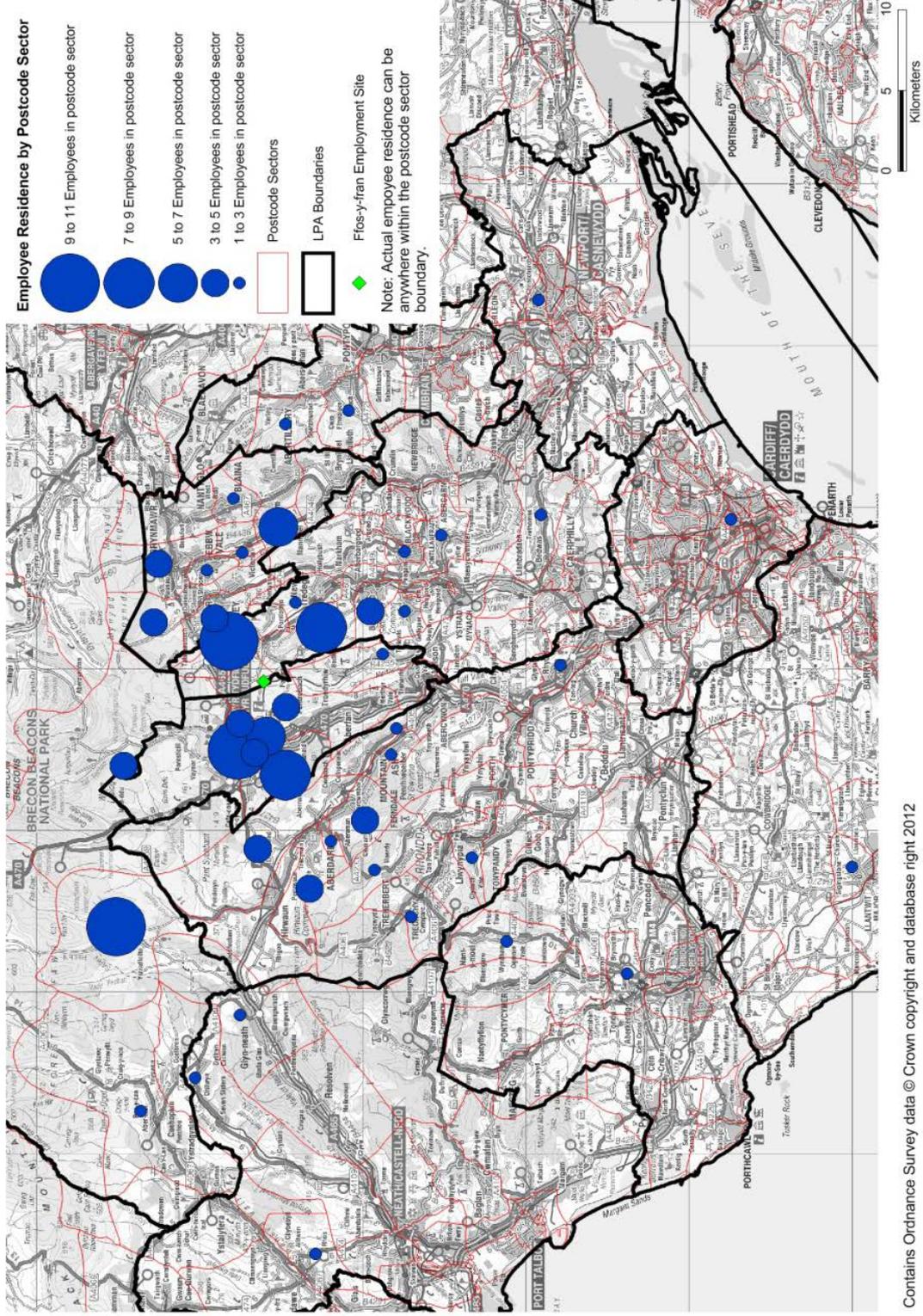
5.84 The direct jobs associated with the development is predominately within blue collar operations employment (principally construction and mining), as identified in Table 5.4.

Table 5.4 Planned Nant Llesg Surface Mine inc: Land Remediation, Employment by Year

	Site Establishment	Production	Restoration	Aftercare	All Years' Average
One Shift					
Plant and Machine Operatives	80%	89%	86%	83%	88%
Office & Management	20%	11%	14%	17%	12%
Split Shift					
Plant and Machine Operatives	88%	94%	91%	89%	93%
Office & Management	12%	6%	9%	11%	7%

5.85 The estimate of jobs needs to be adjusted to consider those workers that will be based in the local economy and those that might commute in from further afield. The latter are considered to be a leakage. In making this assessment, evidence has been compiled from the neighbouring FLRS, to provide information on the location of the existing workforce. The distribution of worker residence from the site is identified in Table 5.5 and Figure 5.2. However this does not include those workers on site employed by others (i.e. the supply chain activity, including outsourced business), which if they were included, would increase the proportion of local workers (resident within 10 miles from the site) from 80% to 85%.

Figure 5.2 Map of FLRS Employee Residence by Postcode Sector, 2012



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Miller Argent (South Wales) Limited

Roger Tym & Partners

Table 5.5 Distances of FLRS Employees from Workplace

Distance from site	0 to 5 Miles	5 to 10 Miles	10 to 45 Miles	45+ Miles	Total
Proportion of workers	50%	30%	16%	4%	100%

5.86 Given that the recruitment of staff for the Nant Llesg Scheme has not commenced, the information on neighbouring FLRS in Table 5.4 is used as a proxy for where employees are likely to live. This gives the estimated breakdown of employment at the Nant Llesg site by distances from where workers might be recruited, which is shown in Table 5.6. As discussed in paragraph 5.15, for the economic impact assessment the local area is defined as being the local economy within 10 miles of the site, and therefore an average of some 115 to 191 jobs might be filled by local residents or considered local jobs.

Table 5.6 Nant Llesg On-site Employment (14 year average)

Travel distance from site	0 to 5 Miles	5 to 10 Miles	10 to 45 Miles	45+ Miles	Total
No. of jobs in a	72	43	23	6	144
No. of jobs in a split shift pattern	119	72	38	10	239

5.87 The expected wage bill for these jobs is some

5.88 **Indirect impacts** are those associated with the knock-on spending with suppliers which will in turn generate new employment. It is not known what the exact level of expenditure on goods and services will be. However data has been provided on FLRS and this represents a good source of secondary information on which to base the appraisal of indirect impacts. The data identifies that over three years (2009-2011) there was £98m, which is £32.7m per annum, of expenditure on goods and services. This was identified to split by suppliers in the following geographic catchment areas:

- Spend < 5 Miles from FLRS = £25.9m (26.4%)
- Spend > 5 < 10 Miles from FLRS = £0.7m (0.7%)
- Spend > 10 Miles but within Wales = £45.7m (46.7%)
- Spend outside Wales = £25.7m (26.2%)

5.89 Miller Argent anticipate the same scale of supplier spending in the Nant Llesg scheme as there is at FLRS because the plant complement will be the same or similar. It is this that drives the major expenditure on goods and services on site not the number of staff. It can therefore also be assumed to be a similar distribution of spend on suppliers to the FLRS, so some 27% of spending would be within 10 miles of Nant Llesg Surface Mine.

5.90 Given the lack of data to identify the type of goods and services that will be sought, an average turnover per job estimate for Manufacturing and Wholesale/retail trade (incl: repair of motor vehicles) is used. This is equal to £226,779 of turnover per job based on the ONS's National Annual Business Survey 2010. This is used to convert the Miller Argent projected supplier spend into a jobs supported equivalent, as shown in Table 5.7. Based on this calculation, over the life of the Nant Llesg scheme the expected indirect effects amount to some 144 gross jobs per annum, which includes 39 local jobs within 10 miles of the Nant Llesg site.

5.91 However this figure of 144 gross jobs per annum will include some of the contractor jobs working on site in the Nant Llesg scheme. Based on the working pattern at FLRS, Miller Argent estimate that about 26 on-site jobs would be contracted out (being the mid-point between 23 on the single shift and 28 on the split shift). Since these jobs have already been counted in the direct on-site jobs estimate above, we subtract them from the indirect jobs to identify the indirect jobs located off-site. After deducting these from local jobs (assuming the same distribution of supplier workers to supplier spending), it is estimated that some 118 indirect jobs will be supported, with some 32 of these off-site jobs being supported within 10 miles of the Nant Llesg site.

Table 5.7: Indirect Impacts Associated with Nant Llesg Scheme, Expenditure on Goods and Services

Distance of expenditure location from site	0 to 10 Miles	10+ Miles but within Wales	Outside Wales	Total	Total minus jobs on site
Expenditure £m	£8.9	£15.3	£8.6	£32.7	
Indirect jobs supported	39	67	38	144	
Indirect jobs supported off-site (i.e. excl: on-site contractors)	32	55	31		118

5.92 **Induced impacts** are presented which includes the spending of employees on goods and services in the economy, supporting further employment and output, plus further rounds of spending by workers and businesses in the local economy.

5.93 A survey of employee spending at the FLRS was carried out to identify where workers spend their earnings and what they purchase to identify the overall value of induced spending. A total of 25 surveys were completed by office and operative staff, with 22 being useable for the assessment. Information on weekly goods expenditure was grossed up to show the average annual spend per worker. This was then multiplied by the average number of on-site employees

at the Nant Llesg scheme under the one and split shift totals, to estimate the likely local employee spend of workers¹⁵. The results are shown in Table 5.8 below.

Table 5.8 Nant Llesg Scheme, Employee Spending Per Annum - all workers ('£000s)

	Within 10 Miles	10+ Miles	Total
Total	£1,747	£634	£2,381

5.94 Using estimates of turnover per job by spending sector taken from the ONS's National Annual Business Survey 2010, in Table 5.9 it is estimated that 25 induced jobs will be supported by the spending of employees at the Nant Llesg scheme, including some 19 jobs within 10 miles of the Nant Llesg scheme. These results are based on the only real data that is available to provide an indication of induced impacts (i.e. from FLRS), but as identified in the earlier Methodology section, they should be treated with a degree of caution because of the small sample size used to inform the estimate.

Table 5.9 Nant Llesg Scheme, Employee Spending Induced Jobs Impacts

	Within 10 Miles	10+ Miles	Total
Jobs supported	18.7	6.5	25.2

(Net) Additionality

5.95 As a starting point it must be assumed that not all of the jobs created will be net additional to the Nant Llesg study area because of leakage, potential deadweight and displacement. Therefore we attempt to estimate the number of jobs created which are additional to the local economy based on a net estimate after allowing for these gross impact effects.

5.96 A **leakage effect** is treated as any economic activity occurring beyond 10 miles of the Nant Llesg scheme site. In the estimates above, we have sought to account for leakages by discounting from the gross figures any of the spending and jobs supported which occur outside this area. Therefore no further reduction to account for leakage effects is required.

5.97 With regard to **deadweight effects**, it is understood that the current site area is predominantly used for grazing and that there are no known alternative development opportunities. However, the local authority have documented that they will be looking to raise money to pay for land remediation of some areas of the site. While this public spending will have a local impact, it can also be considered a diversion of public spending from other items which might benefit the local economy. This deadweight is therefore discounted from the analysis of local impacts supported by the Nant Llesg scheme.

¹⁵ Despite a lower number of jobs under the one shift pattern, the same aggregate spending is assumed. This is because the one shift jobs are assumed to spend more because of higher remuneration, which balances out the difference in there being a lower number of jobs compared with the split shift pattern.

- 5.98 When considering possible **displacement effects**, some of the new jobs will be filled by local residents already working in other business sectors locally. But this would only be an issue that required addressing in areas where there is a tight labour market or a surplus of jobs to economically active residents. Since this is not the case in the Nant Llesg study area, as identified earlier in the baseline assessment, then displacement need not be considered. Also with the similarities of the project to the FLRS scheme, it would be reasonable to assume that some workers at the FLRS would move over to the Nant Llesg operation. But again, with the base position of the capacity within the local labour force, this would lead to further local employment through 'backfilling' opportunities. The impact of this should therefore be considered negligible other than potentially strengthening of the labour market through increased competition for labour.
- 5.99 The results of the additionality estimate for estimating net jobs are presented in Table 5.10 below under the summary of economic impacts.

Summary of Economic Impacts

- 5.100 The summary table brings together all of the gross impacts associated with the Nant Llesg project to identify the net additionality of the scheme when considering the local area economic impacts. Table 5.10 documents the range in total job impacts based on the different one or split shift working pattern within the Nant Llesg scheme.

Table 5.10 Summary of the 14-Year Average Local Jobs Impacts

No. of jobs	One shift pattern		Split shift pattern	
	Total Jobs	Net Local Jobs	Total Jobs	Net Local Jobs
On-site jobs	144	115	239	191
Off-site jobs	118	39	118	39
Induced jobs	25	19	25	19
Total	287	173	382	249

- 5.101 Overall, the Nant Llesg scheme can be anticipated to support broadly between some 287 and 382 jobs depending on whether a one or split shift pattern is employed on site. In terms of local jobs, the impact is estimated to range between 173 to 249 local jobs within 10 miles of the Nant Llesg site.

Social and Community Impacts

- 5.102 The receptors of socio-economic impacts will be people and businesses; more specifically local and county residents who may be trained and employed to work at the site; local businesses which may become part of the supply chain; and local businesses benefitting from employees'

and residents' spend in the local economy. These groups would benefit in terms of profit and jobs created and/or safeguarded, and new skills acquired. In addition, a number of further community benefits are likely to accrue through enhanced recreation opportunities following the restoration strategy and improvements to safety from adits/shafts being remediated. Also, a Community Benefit Fund will sponsor local projects that help meet the requirements of local residents and businesses, along with a continuation of community services currently provided by Miller Argent such as the community mini buses which has been very successful in meeting a specific community need.

Local Jobs and Skills Match

- 5.103 The estimated jobs created would contribute towards improving the balance of jobs to working age residents in Caerphilly and Merthyr county boroughs, and particularly in the towns of Rhymney and Merthyr Tydfil which neighbour the site. The new local employment opportunities which will represent a significant uplift in job spaces in the local Nant Llesg study area which currently comprises just 2,000 jobs for a working age population of around 6,000 residents, as identified in the baseline assessment.
- 5.104 The baseline assessment also indicated that the Nant Llesg study area, Caerphilly and Merthyr Tydfil all had a high proportion of jobseeker claimants who are seeking process, plant and machine operator type jobs and elementary occupations. Based on the jobs to be created in the development of the Nant Llesg site, these job types and roles are expected to account for the substantial proportion of the new direct jobs created – see table 5.4. Consultation with the Bargoed Job Centre office confirmed that there are a high number of unemployed residents with CSCS cards (Construction Skills Certificate Scheme) and dump truck driving qualifications in the area, and this supports the findings that locally available skills are likely to match the required skills in the Nant Llesg Surface Mine and Land Remediation operations.
- 5.105 To maximise local benefits, Miller Argent are committed to implementing a training and recruitment strategy which would focus largely on recruitment of skills from the local community, where appropriate. Each new job created at the Nant Llesg scheme is expected to require training and, based on the experiences at FLRS, it is estimated that there will be more than 40 days formal training per job. For example, the site training for a new truck driver could up to 21 days (depending on experience) with 2 to 3 days per year annual tool box talks, in line with MPQC competent operator criteria. If an average of 2.5 days is assumed for the annual tool box talks, then over the life of the project this would be equivalent to 56 days training for a new driver.
- 5.106 Training is likely to be largely delivered in-house, using an existing training centre with easy access from both the Nant Llesg site and FLRS, but would also make use of specialist training providers/colleges if appropriate. Miller Argent would propose to work with local schools, colleges and training providers to raise awareness of opportunities amongst school children and students, through site visits, careers talks and work placements, as well as through a bespoke apprenticeship programme. Miller Argent has already begun engaging with partners and has recently recruited an Employment and Training Coordinator to carry out the task of local recruitment and training.
- 5.107 Further details on the Miller Argent training and recruitment strategy are provided in the Appended Economic Statement (MA/NL/ES/A05/001).

Reduced Unemployment

- 5.108 It is envisaged that the project will contribute towards a reduction in unemployed jobseekers and those not currently active in the labour market. The training and recruitment strategy is emerging, which would encourage local recruitment of residents who either have or can be taught the skills required to work efficiently and safely on site. Miller Argent would see its role as identifying the job requirements, providing access to a training centre on site, specifying what the training and skills needs are for key roles and providing training to meet identified skills

shortages. Miller Argent would offer guaranteed job interviews to those successfully going through a training programme.

5.109 Aside from the economic benefits of gaining full time employment, a range of positive social and wellbeing impacts such as enhanced self-esteem, health and psychological benefits would be expected for those returning to work from a period of unemployment or inactivity.

5.110 Accordingly not only will the development create the right job opportunities which match local skills, the job creation will be of particular benefit to those most disadvantaged in the workplace (i.e. the unemployed); and the use of programmed skills and training initiatives would be valuable in maximising the take up of local workers who have most to gain from the opportunities.

5.111 Consequently, through the opportunities for local jobs and targeted training to encourage the take up of these jobs by residents from the local area, the social impact of Nant Llesg scheme would be of greatest benefit to the local area.

Visual Impact on Existing Businesses

5.112 The transport, noise and other environmental assessments, including the associated health impact assessment (HIA) accompanying this ES, assess any physical risks to other businesses and workers within the local area. Whilst there are businesses located immediately adjacent to the site, Nant Llesg Surface development will be screened by a visual and acoustic bund for the majority of its operation. The neighbouring FLRS has been running similar activities to the Nant Llesg scheme for some years without any noted effect on local businesses from visual effects.

Pressure on Local Housing and Community Services

5.113 Despite the potential to absorb the number of net new jobs supported by the Nant Llesg scheme, some of these jobs might be filled by new residents attracted by these additional jobs. Consequently the potential impacts on the local housing supply and local services have been considered.

5.114 Given the local labour surplus and the synergy between the type of jobs to be created and the typical jobs sought by unemployed job seekers, combined with the evidence that indicates that a high proportion of the direct jobs will be resourced locally (50% within 5 miles and a further 30% within 5 to 10 miles) it is expected that the additional jobs will not place significant or negative pressure on the demand for housing and community infrastructure/resources. The baseline information suggests that the majority of the locally held posts should be filled by existing residents; however some in-migration may occur.

5.115 Even if there was additional demand for local housing because of the scheme, the earlier baseline assessment identified that there was a surplus of affordable housing in the north of Caerphilly County Borough, so the impact of new migrant workers is unlikely to be a greater burden on the northern area of Caerphilly CBC than it would in the rest of the county borough. In some regards, migration into the north could become part of the solution for dealing with the excess demand identified¹⁶ in the mid and lower part of the county borough should workers at Nant Llesg move away from these areas to the north so as to be closer to their place of work. Therefore freeing up supply or reducing demand for housing in the south where there is greater pressure.

¹⁶ Fordham Research (2007), *Ibid.*

Health Assessment

- 5.116 With the net increase in local jobs in an area with low economic activity and high unemployment, there are likely to be social benefits through the opportunities for local unemployed residents. That is, local jobs will offer health and mental wellbeing benefits associated with gaining permanent employment
- 5.117 The HIA which accompanies the planning application, assesses the potential health issues associated with all stages of the Nant Llesg scheme – preliminary work, coal recovery operations and site reclamation and aftercare.
- 5.118 With regards to air quality: the great majority of parameters assessed in terms of the maximum predicated air quality outputs during the different stages of development are of negligible or minor adverse significance. None of the noise and dust limits set out in MTAN2 are exceeded. Moderate adverse significance is placed on the deposition of dust during Stage 3 (Interim Void) and Stage 4 (End of Coaling) of the development. , and a routine dust control measure would be used to mitigate dust emissions from the site.
- 5.119 A full impact assessment of the Nant Llesg scheme with regards to air quality and noise is set out in Chapters 12 and 13 of this ES respectively.

Urban Common Land

- 5.120 A large proportion of the land to which the Nant Llesg scheme relates is registered as common land forming part of the Gelligaer & Merthyr Common. In order for the proposal to proceed, common rights over the planning application site area would need to be suspended for the duration of the temporary operations, which includes the public right of access over the common for air and exercise.
- 5.121 To facilitate this, an application for the proposed works is being made to the Welsh Government under Section 38 of the Commons Act 2006, details of which have been assessed within the Chapters on Ecology and Nature Conservation; Agricultural Land Use and Soils; Recreation and Tourism; Cultural Heritage; and Landscape and Visual within this Environmental Statement. Reference to the effect of the commons application is also made in the accompanying Health Impact Assessment.

Tourism and Recreation

- 5.122 With regards to recreational facilities and tourism resources, the assessment of the operational effects of the scheme concludes that there are no such facilities or resources located within the Nant Llesg operational area and that notwithstanding the aims of the Caerphilly LDP in regard to Rhymney, there would be no direct effects on the local area during the operational phase of the project. However, some Public Rights of Way would be temporarily stopped, in whole or in part, during the operational phase of the project, and there might be some restrictions to some bridleways.
- 5.123 Overall, the local economy will not be affected since the use of access to common land and these access routes is not associated with any economic activity within the local area. The loss of some social wellbeing might be likely to result from the temporary closure of the common land and access routes. But alternative areas for access are to be provided by the scheme and the loss of common land and/or access routes is not considered to be of sufficient significance to warrant separate consideration within this Chapter of the ES. A full impact assessment of the Nant Llesg scheme with regards to recreation and tourism is set out in Chapter 6 of this ES and is therefore not considered here.

Assessment of Significance

5.124 Having estimated the impacts, it is important to determine their significance against the criteria set out in Table 5.1 earlier in this chapter. The socio-economic effects of the Nant Llesg surface mine, including land reclamation scheme, are therefore summarised assessed for their significance in Table 5.11.

Table 5.11 Residual Significant Impacts

Potential Effect	Magnitude of Effect	Sensitivity of Effect	Significance
Creation of between 287 and 382 jobs, including 173 to 249 local jobs	Major beneficial: the creation of jobs is a beneficial impact of major magnitude. The project will substantially increase the workspace to resident ratio of the local area, where at present there are only 2,000 jobs but some 14,000 working age residents. This represents a significant uplift (+8%) in employment	Moderate to Major beneficial: The majority of jobs will be local (over 50% within 5 miles to the site and 80% within 10 miles). The sensitivity of the area is at least moderate given the high level of local employment deprivation within the ten mile area. The Heads of the Valleys sub-region is a priority regeneration area.	Major beneficial
Increased local training/re-training opportunities	Major beneficial: more than 75% of jobs will receive more than 40 training days.	Minor to Moderate beneficial: the relative education deprivation in the local areas are within the most deprived 20% - 30% educationally deprived in Wales.	Moderate beneficial

Key Parameters for Assessment

5.125 One of the key parameters associated with the assessment is the assumption that the project will be able to offer jobs to those who are unemployed or economically inactive. This is subject to recruitment policies dedicated to sourcing local employees and the provision of adequate training. Miller Argent are committed to developing a local recruitment and training strategy to secure as much economic benefit to the local community as possible.

Cumulative Impacts

- 5.126 Caerphilly County Borough Council has granted planning consent for the NET Energy Group to build a new biomass power plant at Capital Valley Eco Park near Rhymney. According to a news report¹⁷, the construction phase will employ about 30 people on site, with a further 30 being directly employed to produce wood pellets for sale once the plant is operational. The company have also claimed that a further 150 indirect jobs will be supported. It is estimated to be on-site in 2014, which is similar to the start of the Nant Llesg scheme (subject to planning).
- 5.127 The cumulative impact of these additional jobs with the Nant Llesg scheme jobs would add to the major beneficial impact of providing jobs in the area. There is substantial capacity within the existing local labour market to absorb the cumulative jobs benefits without the need to look outside the local area except for specialist skills. Consequently there are unlikely to be any additional requirements for in-migration of workers to fill these jobs and therefore no pressure on the housing supply and community facilities from an in-migration of workers. However, the accumulation of these two schemes should help to strengthen the competitiveness of the local labour market, for the betterment of residents and the wider economy.

Summary/Conclusion

Key Findings

- 5.128 Overall, the socio-economic assessment has identified the following benefits of the Nant Llesg scheme:
- Direct employment: between 144 and 239 jobs (dependent on shift pattern);
 - Indirect employment: 118 jobs;
 - Induced employment (through employee spending): 25 jobs;
 - Average annual supplier expenditure on goods and services: £32.7m;
 - Average annual wages at Nant Llesg: c.£5m;
 - Total project wage bill: £70m;
 - Estimated total employee spending per annum: £2.38m;
 - Total project employee spend: £33.3m;

Mitigation Measures

- 5.129 Miller Argent will support the capture of the benefits identified above through:

¹⁷ See online: <http://www.walesonline.co.uk/news/business/business-news/biomass-plant-scheduled-2014-operation-2502781>

- Working with local schools, colleges and training providers to raise awareness of job opportunities
- Seeking local unemployed residents to be part of the workforce where they have the skills to work efficiently and safely on site
- Offering substantial and continuous training and professional development to staff through a planned increase in the number of in-house trainers and assessors
- Informing local businesses of contract opportunities from the project so that they can bid effectively for them.

Residual Effects:

- 5.130 The creation of between 287 and 382, including 173 to 249 local jobs, over the life of the project will offer a long major beneficial effect. The majority of jobs will be local (over 50% within 5 miles to the site and 80% within 10 miles).
- 5.131 The sensitivity of the area to these effects is at least moderate given the high level of local employment deprivation within the ten mile area, and the Heads of the Valleys sub-region, where these jobs will be supported, is a priority regeneration area.
- 5.132 Overall, the job creation in the local economy offers a long term major beneficial impact.
- 5.133 Through direct employment, there will be increased local training/re-training opportunities, with more than 75% of jobs receiving more than 40 training days. This is identified as a permanent major beneficial impact.
- 5.134 In the context of the relative education deprivation in the local areas, which fall within the most deprived 20% - 30% educationally deprived in Wales, this will have permanent minor to moderate beneficial.
- 5.135 Overall, the training opportunities and effects on the economic activity and unemployment of local residents is considered a permanent moderate beneficial impact.

Cumulative Effect

- 5.136 A consented a new biomass power plant at Capital Valley Eco Park near Rhymney will add to the benefits of Nant Llesg scheme through the creation of 30 short term temporary jobs in the construction and 30 jobs in the production of wood pellets for sale and a further reported 150 indirect jobs. It is estimated to be on-site in 2014, which is similar to the start of the Nant Llesg scheme (subject to planning).
- 5.137 The cumulative impact of these additional jobs with the Nant Llesg scheme jobs would add to the major beneficial impact of providing jobs in the area. There is substantial capacity within the existing local labour market to absorb the cumulative jobs benefits without the need to look outside the local area except for specialist skills. Consequently there are unlikely to be any additional requirements for in-migration of workers to fill these jobs and therefore no pressure on the housing supply and community facilities from an in-migration of workers. However, the accumulation of these two schemes should help to strengthen the competitiveness of the local labour market, for the betterment of residents and the wider economy.

Conclusions

- 5.138 From a social and economic perspective the Nant Llesg Surface Mine, Incorporating Land Remediation, presents positive beneficial impacts of major significance in relation to job creation in the local area and moderate significant positive impacts with regards to the training opportunities and effects on the economic activity and unemployment of local residents.
- 5.139 The project is estimated to support a total of 287 to 382 jobs with a net gain of 173 to 249 net new local jobs (within 10 miles) after allowing for potential deadweight, displacement and leakage effects. The project will substantially increase the workspace to resident ratio of the study area, where at present there are only 2,000 jobs but some 14,000 working age residents. In addition, there will likely be social benefits through opportunities for local unemployed residents, in addition to the health and mental wellbeing benefits associated with gaining permanent employment. The extent of the impacts will be supported by the emerging training and recruitment strategy, which will help to minimise leakage effects.

Nant Llesg Surface Mine

Incorporating Land Remediation

Chapter 6

Recreation and Tourism

Nant Llesg Surface Mine

Incorporating Land Remediation

Environmental Statement

Chapter 6 - Recreation and Tourism

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6 Recreation and Tourism

Chapter Summary

- 6.1 The proposed Nant Llesg Surface Mine including Land Remediation is partly located on the Gelligaer and Merthyr Urban Common (CL38) which predominantly comprises open-mountain grazing land, with some areas of old mineral working deposits and mining dereliction. The public have a right of access over the urban common for air and exercise on foot and on horseback. This area of urban common is also designated as 'Access Land' which reflects the public's right to use the land for the purpose of open-air recreation on foot. In addition, public access is available along a number of public rights of way which cross the site. Rhaslas Pond, within the site is a popular location for walkers. There are no other recreational facilities within the site. Beyond the site recreational and tourist facilities include those within the Brecon Beacons National Park to the north, Parc Cwm Darran to the south, Parc Bryn Bach to the east and at Bute Town Reservoir.
- 6.2 Outside the operational area of the proposed surface mine, land remediation works are proposed to the east, west and south which will include the making safe of a large number of shafts and adits associated with old mine workings, which are located within the common land and access land. Additional areas of land would be made available, outside the site for temporary public access for the duration of the Project and an area for ecological compensation is proposed at Bryn Caerau Farm, to the south-west of the site, to which there would be permissive public access.
- 6.3 During the preliminary site establishment and mining operation phases of the Project there would be a temporary suspension of rights to access approximately 201 hectares of common land and the public rights of way across the site would be stopped up. During remediation works areas to the east of the site would remain open to public access, with some minor deviations to existing routes while remediation works are carried out. Some additional linear routes would also be made available to walkers, and in some cases, horse riders and cyclists. In some instances these would only be available following the completion of the early land remediation works, for example the new routes along the eastern side of the site, adjacent to the Heads of the Valleys Industrial Estate, which are scheduled for completion within two years of commencement of coaling. The existing bridleway that runs to the north of the site would also be permanently extended to allow east-west access between the A469 and the Fochriw Road. Rhaslas Pond would fall within the operational area and would not be available for public access, until such time as the restoration of the site is complete. There would therefore be minor adverse effects on common land and public rights of way during the coaling operations, although the effects on public rights of way would be reduced by the provision of additional recreational routes as a result of land remediation works.
- 6.4 The site would be restored in accordance with the Restoration Strategy, which includes the re-instatement of the rights of common and public access, public rights of way and additional linear routes. This includes small additions to the area of common and new routes along the eastern side of the site adjacent to the Heads of the Valleys Industrial Estate, some of which would be available within two years of the commencement of coaling, together with the creation of a new bridleway across the site following the alignment of the old dismantled railway and the establishment of the Rhymney Valley Ridgeway Walk along a new bridleway. Links between the common and adjoining recreational resources such as Parc Cwm Darran and the national cycle network would also be improved by the provision of these new routes. Rhaslas Pond would be re-established and a new footpath would be created running along the northern side linking to other linear routes across the common. The Bent Iron would be reinstated on the edge of the urban common within a stone faced terrace. The restoration would therefore result in long term minor benefits to the Gelligaer and Merthyr urban common and minor to moderate benefits to the local public rights of way network.

Introduction

- 6.5 This chapter of the Environmental Statement presents the details of the Environmental Impact assessment (EIA) for potential impacts of the Nant Llesg Surface Mine including Land Remediation (the 'Project') on Recreation and Tourism.
- 6.6 The chapter will:
- Present the existing environmental baseline established from desk studies and site surveys;
 - Present the potential environmental effects arising from the Project, based on the information gathered and the analysis and assessments undertaken;
 - Identify any difficulties encountered in compiling the environmental information; and
 - Highlight any necessary mitigation measures which could prevent, minimise, reduce, offset or compensate for the possible environmental effects identified during the EIA process.
- 6.7 This chapter considers the likely environmental effects on recreational and tourist resources arising from the site establishment operations, the operational surface mining, remediation and reclamation phases of the Project. This includes effects on recreational and tourist resources and land used for recreational activities, including walking, cycling and horse riding along the existing network of public rights of way (PRoW), common land and other land benefitting from a right of public access.
- 6.8 Information in relation to the potential effects on the amenity, or relative pleasantness, of recreational and tourist resources or sensitive receptors within local communities are set out in Chapters 16 (Landscape and Visual Resources), Chapter 12 (Air Quality) and Chapter 13 (Noise), where appropriate. Chapter 7 (Traffic and Transport) provides an assessment of the impact of the scheme on health and fitness.

Methodology

- 6.9 This section sets out the methodology used during the assessment of effects on recreational and tourist resources.
- 6.10 The assessment addresses the potential effects on recreational and tourist resources including common land, other land used by the community, recreational facilities and public rights of way (PRoW), arising during the operational (mining) and land remediation and restoration stages of the Project and includes:
- A review of relevant policy and guidance;
 - A desk top baseline study to identify those recreational and tourist resources within and in proximity to the scheme, the additional areas of land identified for land remediation, and areas for temporary public access and/or grazing;
 - Site visits to establish the nature and condition of those resources;

- User counts to establish the level of use of PRow and areas of urban common land affected by the scheme;
 - Consultation with Caerphilly County Borough Council (CCBC) and other relevant stakeholders to discuss common land and other recreation and tourist resource matters;
 - Assessment of the potential effects on recreational and tourist resources.
- 6.11 The source material for the baseline desk study has included OS mapping, definitive maps of public rights of way (PRow), common land register data, tourist information and information about tourism/recreation facilities available from the local authority and web resources. Information in relation to the amenity of recreational and tourist resources are set out in Chapters 16 (Landscape and Visual Resources), Chapter 12 (Air Quality) and Chapter 13 (Noise), where appropriate and described in this chapter.

Study Area

- 6.12 The recreation and tourism study area comprises the area within the planning application boundary, including the coal extraction area, overburden mounds, workshop areas, and areas for land remediation (Drawing MA/NL/ES/06/001). It also includes recreational and tourist resources that are located immediately proximate to these areas or which link to them. Resources which are located further away but which have views of the scheme are included within the Landscape and Visual study area and effects on the amenity of these resources are assessed within Chapter 16 (Landscape and Visual Resources).
- 6.13 The study area also includes parcels of land that have been assessed for their suitability to provide alternative public access and/or grazing resources in relation to the Project. Those assessed to be suitable would, in some cases, be voluntarily offered either as temporary grazing with public access or as public access land for the duration of the Project, with others offered as permanent areas of common. The study area also includes an area that has been identified for ecological compensation, to which permissive access will be allowed (Planning Application Drawing MA/NL/PA/040).

Assessment Guidance

- 6.14 There are no standard criteria for assessing the significance of effects on recreational and tourist resources and therefore account has been taken of the guidance that is provided on these topics in the DMRB Volume 11, Section 2, Part 5, HA 205/08¹. Although developed for highways projects, the DMRB methodology is also useful for other forms of development.
- 6.15 In addition, the assessment has taken into account the following advice/guidance, together with professional judgement on the nature and magnitude of change in order to determine the likely effects:

¹ The Highways Agency, Scottish Government, Welsh Assembly Government, The Department for regional Development Northern Ireland 'The Design Manual for Roads and Bridges, Volume 11 'Environmental Assessment'

- The requirements of EIA as set out by the EIA Regulations 2009 which give effect to EC Directive 85/337/EEC, as amended by Directive 97/11/EC.
- Welsh Office, *Circular 11/99 Environmental Impact Assessment* (1999)
- Institute of Environmental Management and Assessment (IEMA) *Guidelines for Environmental Impact Assessment*, 2004 (IEMA, 2004).
- Generic best practice advice on EIA provided by *Minerals Technical Advice Note 2: Coal* (January 2009).

Planning Policy Context

National Planning Policy

- 6.16 Current national planning policy in Wales is set out in ‘Planning Policy Wales’ (PPW) Edition 5 published by the Welsh Assembly Government in November 2012. National objectives for tourism, sport and recreation are set out in Chapter 11 of PPW. The stated objectives for tourism are:

“to encourage sustainable tourism in Wales, promoting local prosperity and supporting community well-being and involvement, whilst protecting and giving value to natural heritage and culture, and

to manage the tourism sector in ways which minimise environmental impact.”

- 6.17 It is recognised that sport and recreation contribute to our quality of life and in that regard the main planning objectives are to promote:

“a more sustainable pattern of development, creating and maintaining networks of facilities and open spaces in places well served by sustainable means of travel, in particular within urban areas;

social inclusion, improved health and well-being by ensuring that everyone, including children and young people, the elderly and those with disabilities, has easy access to the natural environment and to good quality, well-designed facilities and open space; and

the provision of innovative, user-friendly, accessible facilities to make our urban areas, particularly town centres, more attractive places, where people will choose to live, to work and to visit.”

- 6.18 In relation to public rights of way, PPW states at paragraph 11.1.13 that *“Local authorities should seek to protect and enhance the rights of way network as a recreational and environmental resource.”*

- 6.19 National objectives for transport are set out in Chapter 8 and includes at Section 8.2 ‘Promoting walking and cycling’ in relation to the impacts of development on pedestrians, the encouragement of cycling for short trips and the implementation of measures to develop safe pedestrian and cycle routes.

- 6.20 PPW is supported by a series of Technical Advice Notes (TANs). Those of relevance to the recreation and tourism topic comprise:

- TAN (Wales) 13 Tourism, Welsh Office (1997) which provides advice on tourism related issues in planning, including occupancy conditions, caravans and chalets development, and other related advice.
- TAN 16 Sport, Recreation and Open Space, Welsh Assembly Government (2009) which provides advice on access to the countryside, accessibility and rights of way. The stated aims of TAN 16 are “to further integrate the links between health and well-being, sport and recreational activity and sustainable development in Wales through the development of land use planning guidance in accordance with policies set out in PPW”. It incorporates advice on the protection and enhancement of existing sport, recreation and open space facilities, including footpaths and cycle routes, golf courses and other green spaces and acknowledges that access to the countryside is important to the rural economy.

6.21 National minerals planning policy is currently set out in Minerals Planning Policy Wales and, in relation to coal, is supported by guidance contained in Minerals Technical Advice Note 2: Coal (MTAN2) published by the Welsh Assembly Government in January 2009. MTAN2 addresses recreation and tourism matters under the following sections:

- Protecting areas of importance: Other Landscape Designations

“Common Land

81. Planning Policy Wales recognises that common land is a finite resource and should not be developed unnecessarily. Access to it should not be prevented or impeded unnecessarily and its proper management should be encouraged.”

Protecting areas of importance: Public rights of way

95. Public Rights of Way often cross coal working sites and are diverted or extinguished for the permission. The applicant should identify such routes at an early stage and discuss them with the surveying authority.

- Appendix F: Best Practice Environmental Impact Assessment, including the provision of new opportunities for access and informal recreation, as a compensatory measure when effects remain and cannot be prevented or reduced.

Local Planning Policy

6.22 The Project, excluding some of those areas outside the operational site that would be offered for temporary or permanent public access and/or grazing, lies within the administrative area of Caerphilly County Borough Council where the development plan currently comprises the Caerphilly County Borough Local Development Plan (LDP).²

6.23 Strategic policies within the LDP of relevance to the recreation and tourism topic comprise:

- SP11 Countryside Recreation, in relation to the promotion of sustainable access opportunities within the County Borough; and

² Local Development Plan (LDP) at <http://www.caerphilly.gov.uk>

- SP18 Protection of Strategic Leisure Network, in relation to the protection of important networks of public open space, natural green space and recreational facilities.
- 6.24 Area specific policies for Strategy Area 1 (Heads of the Valley Regeneration Area), within which the Nant Llesg scheme is located, of relevance to the recreation and tourism topic, comprise:
- TR1 Cycle Routes, in relation to the safeguarding of land to facilitate improvements to the cycle route network for the 'Link from Fochriw to NCN 46 via Rhaslas Pond' (TR1.6).
- 6.25 This is a local cycleway link from Fochriw to National Cycle Network Route 46 / Heads of the Valleys, with the objective of extending the existing Darran Valley Route to the north to provide tourism opportunities and improved community access to the countryside. The indicative line for this proposed cycleway, in the vicinity of the scheme, runs predominantly along the route of the dismantled railway to the local road and then northwards to connect to National Cycle Network Route 46 / Heads of the Valleys.
- 6.26 Some of the areas identified for temporary recreation or grazing and recreation during the lifetime of the Project lie within the administrative area of Merthyr Tydfil County Borough Council where the development plan currently comprises the Local Development Plan (LDP) which was adopted in May 2011. Borough wide strategic policies of relevance to this topic are:
- Policy BW11: Transport, cycling and pedestrian proposals relating to the provision of new facilities.
 - Policy BW16: Protecting /enhancing the network of leisure facilities which includes public open space and public rights of way.

Consultation

Scoping

- 6.27 A scoping opinion from Caerphilly County Borough Council in relation to the proposed Nant Llesg scheme was provided in a letter dated 26 August 2011. In their response to CCBC dated 20 July 2011, the Countryside Council for Wales (CCW) stated, with regard to access and recreation:

"The operation of the Nant Llesg proposal will have implications for the current public access and recreation opportunities of the site and surrounding area.

We note that over 50% of the proposed scheme area is open access land and the Rhymney Valley Ridgeway Walk runs along the eastern side of the scheme area. The effects of the proposal upon the public's access to and enjoyment of the countryside should be assessed and any mitigation measures detailed in the EIA. This will ensure that the public's access to the countryside is maintained and improved and that alternatives during the reclamation phase are considered and appropriate provision provided."

- 6.28 A further scoping opinion from Caerphilly County Borough Council was provided in a letter dated 9 March 2012 in response to a revised scoping report for the proposed Nant Llesg Surface Mine. This included a summary of responses from consultation bodies, including CCW, which stated in relation to access and recreation:

"We have previously commented at the initial scoping stage. It is important that the ES considers [an] assessment on the effects of the proposed scheme on access and recreation

provision in the local area including the BBNP, Rhymney Valley Ridgeway Walk and Gelligaer Common”.

- 6.29 Following revisions to the Project a further scoping opinion was received from Caerphilly County Borough Council in a letter dated 23 August 2012. This confirmed that the amendments to the scheme raised no additional issues that needed to be addressed in the EIA in relation to Recreation and Tourism to those requested to be dealt with in the earlier scoping opinions.

Stakeholder Engagement

Caerphilly County Borough Council

- 6.30 A preliminary meeting was held with Caerphilly County Borough Council (CCBC) on 20 October 2011. The following comments were received in relation to recreation and tourism:
- Restoration plans should focus on maximising the recreational, landscape and ecological potential of the site;
 - Recreational after-use should be in the form of informal countryside facilities and should take account of existing uses (e.g. walking, angling) and current CCBC strategies for the development of tourism in the area (e.g. the ‘gateway’ to Caerphilly from the Heads of the Valleys Road) ;
 - The potential for creating a network of cycle routes should be considered.
- 6.31 A further meeting was held with the Public Rights of Way department at CCBC on 14 August 2012. The purpose was to provide an outline of the Project within the administrative boundary of CCBC, with particular reference to potential effects on public rights of way (PRoW) including to confirm that the baseline data held was correct and to discuss the development of a pre-operations strategy to temporarily stop-up or divert PRoW, where necessary, so as to minimize disruption to the PRoW network. At the meeting CCBC confirmed that the baseline data presented to them was correct and stated that although no PRoW user data was available, Gelligaer Footpath 151 north to Rhaslas Pond and south to the reservoir to the west of Fochriw was the most well used local route. CCBC issues and aspirations with regard to public access in the area were also discussed, including the development and promotion of the Rhymney Valley Ridgeway Walk and enhanced access in the Bute Town area. Current problems with accessing the network arising from impeded access due to fencing across some PRoWs in the area and lack of signage, particularly to the north of the Nant Llesg site, were also highlighted by CCBC.
- 6.32 Further consultation has been undertaken with CCBC during the development of the Project, particularly in relation to the remediation works and restoration strategy for the site. A meeting was held with the PRoW department on 18 February 2013 to discuss the PRoW that would need to be stopped up during the scheme, proposed diversions and creation of PRoW, together with the overall proposals for enhancing the recreational resources within and adjacent to the site network during the first 24 months of the Project and as a result of the land restoration following the cessation of mining. It was agreed that the proposals would provide appropriate resources for walkers and horse riders both during site enabling works and mining operations and following site restoration and after-care. The provision of temporary areas for public access during the Project was also discussed and it was agreed that the areas proposed would provide suitable alternative resources for local residents during the lifetime of the Project.

- 6.33 A further meeting was held on 16 April 2013 to clarify the PRow baseline in relation to historic public path orders that had amended the alignment of Gelligaer footpath 151 and Gelligaer bridleways 89 and 92.
- 6.34 Consultation has also been undertaken with CCBC officers and their Land Access Forum in relation to the development of a common land strategy for the Project and the proposal to make an application under Section 38 of the Commons Act 2006 for consent to carry out works on common land was discussed.

Community Consultation

- 6.35 Five public exhibitions were held during January and February 2012 in Pontllytyn, Rhymney, Abertyswg and Fochriw. A number of attendees provided verbal responses to the proposals and, in relation to recreational or tourist resources, stated that Rhaslas Pond is, and has historically been, a popular local feature. In addition to people walking their dogs up to and around the pond, there was also reference to the pond being used for swimming/paddling in the past. A number of suggestions were also made in relation to potential local community benefits that might arise from the Project including picnic areas, cycle routes, footpaths and trails, a tourism centre and a guarantee that public access to the site would be reinstated following completion of site enabling, mining and restoration works.

Common Land Consultation

- 6.36 Additional stakeholder consultation has been undertaken in relation to the proposed application under Section 38 of the Commons Act 2006. This has involved the following parties:
- Owners of the land (including Dowlais Top Investment Co. Ltd. and Caerphilly County Borough Council);
 - The Gelligaer and Merthyr Commoners Association and through them the commoners;
 - Caerphilly CBC as the council in whose area the common is located;
 - Merthyr CBC as the commons registration authority;
 - Countryside Council for Wales;
 - Cadw; and
 - Open Spaces Society
- 6.37 Responses to this consultation exercise have been received from the following bodies.
- Caerphilly Local Access Forum: The response stated that the land proposed for use for public access for the duration of the scheme was considered to be sensible and would perform a useful purpose in connecting parts of the existing common, open access land, the rights of way network and areas of population. The Forum also raised questions about access points, management of the land and the means by which access opportunities would be advertised. These matters are addressed in the assessment section of this chapter and have been communicated back to the Forum.
 - The Open Spaces Society (OSS): The response stated that the OSS was satisfied with the presentation provided in relation to the proposed Section 38 application and that unless any members raise any unexpected issues it is not anticipated that the OSS would object to the application. They further stated that the proposal has been developed in a thorough

way and that the public interest is generally protected and that, in the long term, the area will be improved.

Baseline Environment

Common Land

- 6.38 The proposed Nant Llesg Surface Mine including Land Remediation contains a large proportion of land which is registered as urban common land as defined by Section 193 of the Law of Property Act 1925. This forms part of the Gelligaer and Merthyr Urban Common (CL38) which extends to approximately 3,090ha and over which the public have a right of access for air and exercise (Drawing MA/NL/ES/06/002). The area of common land within the operational boundary forming part of the CL38 is 201 hectares, which represents approximately 6.5% of the total area of the Gelligaer and Merthyr urban common.
- 6.39 The common predominantly comprises open-mountain grazing land, with some areas of old mineral working deposits and mining dereliction. The Caerphilly Biodiversity Action Plan, published in 2002, confirms that the common includes relatively large areas of upland heath including dry heath characterised by the presence of western gorse and wet heath, good communities of which occur north of Fochriw.
- 6.40 This area of urban common is shown together with 'Access Land' on the NRW 'Access Maps', although being 'excepted' by Section 15 of the Countryside and Rights of Way Act 2000 (CRoW Act) as not falling within the definition of 'access land' given at Section 1(1) of the Act. Gelligaer and Merthyr Urban Common represents approximately 53% of the total area of the combined area of access land and common land in the County Borough, which is stated by CCBC to be 5783 hectares³.



Photo 6.1 View northwards from Gelligaer and Merthyr Urban Common towards Rhymney

³ <http://www.caerphilly.gov.uk/countryside/english/walking/openaccess.htm>

- 6.41 In relation to its use as a recreational resource the land within the Project area is described in Landmap as an area of high upland moor⁴ which contains variously historic and contemporary evidence of human occupation and as such is a commodity for leisure enjoyment as well as providing very extensive "green lungs" to supplement those identified in urban landscapes that it surrounds⁵. It is stated that there is a strong underlying feel of the industrial past with views dominated by adjacent upland areas, with visual detractors including overhead pylons and the A465 where there is an impact from noise and movement. Overall it is considered that this is a discordant area with slightly unsettling air⁶.
- 6.42 An additional visual detractor in the area is the Trecatti landfill site which is particularly visible from the north. Some elements of the operational Ffos-y-fran Land Reclamation Scheme (FLRS) are also visible from site, notably the overburden storage areas to the east of the operational area. Views of the nearby Cwmbargoed Disposal Point are also available from the site.
- 6.43 The Gelligaer Common Special Landscape Area (SLA) begins to the south of Fochriw at Pentwyn well outside the site boundary. It is noted in Appendix 1 of the Caerphilly LDP that *"the area offers extensive opportunities for recreation and access although there are signs of degradation and loss of quality through fly tipping and litter in general."*
- 6.44 A strip of land operated by Merthyr Industrial Services is used as a waste tipping operation along the disused railway cutting in the southern sector of the operational site. Although surrounded by the Gelligaer and Merthyr Urban Common on 3 sides, the land is not registered as urban common and is not crossed by any public rights of way.

Public Rights of Way

- 6.45 The following public rights of way (PRoW) either cross the site, are proximate to or link with it (see Drawing MA/NL/ES/06/003). The alignment of these PRoW have been taken from the Definitive Map of PRoW held by CCBC, as updated by confirmed public path orders, and informed by the accompanying Definitive Statement. The baseline position has been agreed with CCBC.
- Gelligaer Footpath (FP) 86 which runs west to east from South Tunnel Road, to the east of the line of the dismantled railway, to its junction with Gelligaer FP85 to the north of Pontlottyn just outside the southern boundary of the site;
 - Gelligaer FP85 which runs north-east to south-west from Gelligaer Bridleway (BR) 89 to the west of the A469 in Rhymney to its junction with Gelligaer FP86 and southwards towards Pontlottyn;
 - Gelligaer FP83 and Gelligaer FP84 which cross the common to the south of and outside the site to the north of Pontlottyn and Fochriw, linking to Gelligaer FP85 and Gelligaer FP86 and the local roads between these settlements;
 - Gelligaer Bridleway (BR) 89 which runs along the eastern edge of the Project area from the A469 in Rhymney northwards to its junction with the road through the Rhymney Valley

⁴ Historic Aspect Area (CynonHL831)

⁵ Cultural Aspect Area (CynonCL056)

⁶ Visual and Sensory Aspect Area (CynonVS361)

Industrial Park. It then runs along this road, outside the site boundary, to the middle of the Industrial Park from where it proceeds northwards as Gelligaer BR92 to its junction with Gelligaer BR93 just west of the A469 north of Rhymney outside the site boundary;

- Gelligaer BR93 runs east-west from its junction with Gelligaer BR92 outside the site boundary along the stream valley which forms the northern boundary to the site ;
- Gelligaer FP90 runs east-west across the site from its junction with Gelligaer FP95 to the west of the Heads of the Valleys Industrial Estate to a point to the east of the Fochriw Road. A spur running northwards some 233 metres before its western end meets the Gelligaer FP97, which then runs northwards to meet the western end of Gelligaer BR99;
- From the start of Gelligaer FP90 to the west of the Heads of the Valleys Industrial Estate, Gelligaer FP95 runs northwards within the site and then runs east-west across the site to meet the western end of Gelligaer BR93 at its junction with Gelligaer BR99 and then onwards across the Fochriw Road;
- Along Gelligaer FP95 there is a junction with Gelligaer FP96 which runs north-westwards within the site to meet Gelligaer BR93 just outside the site boundary;
- Gelligaer FP98 runs in a westerly direction from Gelligaer FP95 in the north-western corner of the site across the Fochriw Road to of its junction with Gelligaer FP100;
- Gelligaer FP100 starts at two spurs which run from the western and eastern sides of the former settlement of Pant-y-wan and combined to run westwards across the Fochriw Road and then north-westerly to its junction with Gelligaer FP98;
- Gelligaer BR146 runs between the Pentwyn to Dowlais Road, opposite Gelligaer FP145, and proceeds east skirting the southern end of the reservoir known as Pond Feeder outside the site, to its junction with Gelligaer FP151, approximately 15 metres inside the site;
- North of Rhaslas Pond, Gelligaer FP149 runs from Gelligaer FP151 within the site westwards across the Fochriw Road;
- Gelligaer FP151 which runs south-east from its junction with Gelligaer FP100 to cross the Fochriw Road through the site to the north-west corner of Rhaslas Pond, then generally north-south past Rhaslas Pond on its western side, across South Tunnel Road and southwards to its junction with the Fochriw/Bargoed Road to the south-west of the village of Fochriw;
- In the area to the north of Gelligaer BR93 and the A465 Heads of the Valleys Road there are a number of other public footpaths which lie outside the study area, with links to Gelligaer BR93 and Gelligaer FP95.



Photo 6.2 Public footpath (Gelligaer FP90) obstructed by fencing of the common

- 6.46 In addition to these public rights of way, the northern part of the Rhymney Valley Ridgeway Walk runs north-south across the site, but does not follow any PRoW along its line from Fochriw to Butetown. It runs from the A469 north of the Rhymney Valley Industrial Estate over the urban common to Footpath 86, from where it continues south over the urban common to South Tunnel Road at Fochriw. From Fochriw the walk follows countryside paths, informal tracks, rural lanes and public rights of way southwards following the Rhymney Valley to join a circular route around the Caerphilly Basin.
- 6.47 The Rhymney Riverside Walk, a linear walk from Rhymney in the north to Cefn Mably at CCBC's southern boundary with Cardiff, is partially in place and will fall well outside the site boundary. Information included in the Deposit LDP Background Paper 11 on Tourism (2008) states that *"the Rhymney Riverside Walk is a linear route that requires protection as a long distance footpath. This will help facilitate the completion of its proposed course along the banks of the River Rhymney, which links into a network of informal green spaces.....The walk will comprise of landscaped walkways with observation points, maximising use of the river as a resource for tourists and linking to other paths such as the Rhymney Ridgeway Walk."*
- 6.48 No national cycle routes fall within the Project area. The nearest sections comprise part of the National Route 46 along the Heads of the Valleys Road to the north and National Route 469 to the south of Fochriw which links with Parc Cwm Darran to the south. Both are traffic-free routes. A new section of National Route 469, along the alignment of the dismantled railway, to link with Glan-y-Nant in the south of Fochriw was completed in 2012. Additional extensions to this route are planned to join the existing and proposed sections of National Route 468 which will run to the east of the A469.
- 6.49 Alongside the development of the Regional Transport Plan, it is reported in the Deposit LDP Background Paper 12 'Transport' (2008) that *"Sustrans are also working in partnership with local authorities to develop the Valleys Cycle Network (VCN) proposal, which is a 'vision for a network of walking and cycling routes across the South Wales Valleys'. The VCN is being developed on a regional basis and will form the basis of a bid for EU Convergence funding"*.
- 6.50 A recreation user survey was undertaken during 2011 and 2012 to ascertain the level of pedestrian, equestrian and cycle use of the footpaths, bridleways and urban common within the boundary of the scheme. Full details of the survey are provided in Appendix MA/NL/ES/06/001. The survey was undertaken at three locations (Drawing MA/NL/ES/06/004) on four separate occasions both within and outside school holidays. The following survey dates were chosen to

include a weekday (to reflect everyday use of the PRow network) and a weekend day and bank holiday (as this tends to coincide with the greatest level of use of the PRow network), so that a fair estimation of public use could be made.

- Friday, 19 August 2011 (weekday) – sunny with some cloud, breezy, light rain;
- Sunday 18th September 2011 (weekend day) – cloudy and raining;
- Sunday 30th October 2011 (weekend day) – cloudy with some sunny spells;
- Tuesday 5th June 2012 (bank holiday) – cloudy with some light rain.

6.51 These surveys were generally undertaken over a 12 hour survey period, although they were split into 2 x 6 hour periods on 18th September and 30th October due to weather conditions.

6.52 The results of the survey can be found in Appendix MA/NL/ES/06/001 and a summary of the findings is presented in Table 6.1 below. Survey locations are shown on Drawing MA/NL/ES/06/004.

Table 6.1 Recreation User Survey – summary of findings

Location	Type of Use	Level of Use	Highest Use	Resident/visitor
1 – Car park off Fochriw Road	66.7% walkers 20.8% cyclists 4.2% equestrians and 8.3% other users (people riding dirt bikes) 60% had a dog	40% more than 1 x week 40% more than 1 x month 20% less than 1 x year	11 people over 12 hours on Friday 19 th August 2011 and 6 people over 6 hours on Bank Holiday Tuesday 5 th June 2012	100% were local residents (living within 5 miles of the site); 60% of whom arrived by car
2 - Fochriw	90% walkers 10% equestrians	87.5% more than 1 x week 12.5% more than 1 x month	14 people over 12 hours on Friday 19 th August 2011 and 7 people over 6 hours on Bank Holiday Tuesday 5 th June 2012	100% were local residents (of either Fochriw or Rhydney)
3 – Bute Town	No users were observed on any of the survey days	No walkers or equestrians were observed crossing the common land*	N/A	N/A

* Some walkers, the majority with dogs, were observed walking around the Bute Town reservoir but they did not enter the common land or use any PRow within the Nant Llesg site.

- 6.53 At Location 1 the highest level of use was recorded on the Bank Holiday (Tuesday 5th June 2012) closely followed by the weekday (Friday 19th August 2011). On the weekend survey dates, fewer users were observed on Sunday 30th October 2011 (3 people) than on Sunday 18th September 2011 (4 people), despite the weather being better and the survey period longer. These surveys indicated that of the users observed, 66.7% were walkers, 20.8% cyclists, 4.2% equestrians and 8.3% other users (people riding motor bikes). Most were walking along Gelligaer FP151 to/from Rhaslas Pond to the north or Pond Feeder to the south. Of those interviewed 100% of the users were local residents who lived within 5 miles of the site; 60% of whom arrived by car from their nearby residences and parked in the car park. 80% of users stated that the purpose of their visit was for leisure, and 60% had a dog. The implication is that, since dogs require walking on a regular basis, local residents will use this popular public footpath across the urban common for this purpose frequently and for short periods. It is considered that, both the level of use and range of activities recorded on the survey days at this location are likely to be representative of normal use.
- 6.54 At Location 2 the highest average level of use was recorded on the weekday (Friday 19th August 2011) and the Bank Holiday (Tuesday 5th June 2012). On the second survey date (Sunday 18th September 2012) when it rained continually over the survey period, no users were recorded. On the other weekend survey date (Sunday 30th October 2012), although the weather was much better, only 1 user was recorded. Given the level of use recorded on the Bank Holiday, it was surprising that more users were not observed on the weekend survey dates. The activities for which the common land was used were walking with purpose to a destination (i.e. as a short-cut/alternative route avoiding using the road), for recreation and/or dog-walking and horse-riding. Of users observed, 90.9% were walkers and 9.1% equestrians. The majority of users (71.4%) were using the common land for a purpose other than leisure. When questioned, these users said they were heading to/from Pontlottyn or Rhymney. Some users pointed out that there are 2 routes to Pontlottyn – via the road or taking a shortcut across the common land – and that when the ground conditions are good they use the latter option. This was evidenced by the high level of users observed walking on the road, who may have been heading to/from Pontlottyn or Rhymney. Since the majority of users were walking with purpose, it could be concluded that the lower level of use on the weekend days (both Sundays) may be due to shops and offices in Pontlottyn and Rhymney not being open on Sundays. A higher level of use on the Bank Holiday would be generally expected and is borne out by the survey.
- 6.55 Of the users interviewed at Location 2, 100.0% were local residents (of either Fochriw or Rhymney) and the majority of those using the common land for leisure had a dog. The implication is that, since dogs require walking on a regular basis, local residents will use the common land for this purpose frequently and for short periods. It is considered that, both the level of use and range of activities recorded on the survey days at this location are likely to be representative of normal use.
- 6.56 Over the four survey dates at Location 3, no users were recorded using the urban common or the PRoW across the common or linking to it from the north, including along the indicative alignment of the Rhymney Valley Ridgeway Walk. A number of walkers were observed on all survey days walking around the Butetown Reservoir and public footpath Gelligaer 102 which runs along its southern bank. The majority were walking a dog. A number of cyclists were also observed using the cycle path alongside the A469 near Butetown.
- 6.57 An additional 4 hour user count was undertaken on Sunday, 17th June 2012 at the junction of Gelligaer FP151 and Gelligaer BR146 to the west of Fochriw. This survey observed 3 pedestrians and 5 cyclists crossing the common land between Fochriw and these public rights of way. Responses to the questionnaire showed that all were local residents of Fochriw engaged in leisure activities of less than 1 hour in duration.

Recreational Facilities

- 6.58 Apart from the area of common land and the PRowWs described above, the only other facility that falls within the Nant Llesg site that is used as a recreational resource is Rhaslas Pond. In addition to being a popular destination for walkers, respondents to the community consultation events stated that it has been used for swimming and paddling in the past although there was no evidence of this recorded during the recreational surveys.



Photo 6.3 View towards Rhaslas Pond from the north

- 6.59 Outside the site there is a range of recreational resources, details of which are provided below (Drawing MA/NL/ES/06/005).

Brecon Beacons National Park

- 6.60 The southern edge of the Brecon Beacons National Park (BBNP) between Merthyr Tydfil and Tredegar is located to the north of the A465 Heads of the Valleys Road, approximately 3km from the northern boundary of the Nant Llesg site. The park, in whole, extends from Llandeilo in the west to Abergavenny in the east and Brecon in the north, covering 1,346 square kilometres. Public access is available on areas of common land (35% of the BBNP is common land) and access land and along the 1,983km of public rights of way⁷.

- 6.61 Key features of the BBNP include:

- Cave systems: four out of five of the longest cave systems in the UK lie within BBNP;
- Scheduled ancient monuments: there are 268 within the park;
- Red Grouse: the park is the species most southerly home in Wales;

⁷ BBNP has the largest area of open hill common in Wales (From BBNP Pocket Guide (2009))

- Welsh Mountain ponies: BBNP is the main stronghold for these ponies;
 - Limestone pavement: over 70% of the limestone pavement in Wales lies within BBNP;
 - Waterfalls: the park is home to the greatest collection of waterfalls in one small area in the UK, around Ystradfellte and Pontneddfechan, which are home to some of Wales' rarest mosses and ferns;
 - Bats: Britain's largest breeding population of Lesser Horseshoe Bats (*Rhinolophus hipposiderae*) live in the park.
 - Trees: Some of the rarest trees in the world are various species of whitebeam (*Sorbus* species) which only survive in BBNP.
- 6.62 The BBNP offers a wide range of outdoor activities including walking, cycling, horse riding and water sports, details of which are available from the National Park Authority and also the Countryside Council for Wales (CCW) website which includes a guide to land and paths that are normally available for public access on foot. Guided walks are also organised by the Brecon Beacons National Park Authority and the Brecon Beacons Park Society.
- 6.63 Within the BBNP there are around 225km of rivers including the River Wye and the River Usk and its tributaries, over 50km of canals, 9 reservoirs and Wales's largest natural lake at Llangorse, which offer a wide range of water-based recreational activities such as sailing, wind surfing, kayaking, canoeing and fishing.
- 6.64 The National Park Visitor Centre is located at Libanus, near Brecon, with other visitor facilities available at Craig-y-Nos Country Park, the Abergavenny Tourist Information and National Park Centre and The Waterfalls Centre at Pontneddfechan.
- 6.65 In addition to providing important recreational facilities, the BBNP also fulfils an important tourist function, attracting visitors from home and abroad. Many tourism businesses are located in the national park and the local communities rely on the income that is generated by the tourism sector. Around 5 million visitor days are spent in BBNP each year, which in 2011 brought around £206million to the local economy⁸.

Parc Cwm Darran

- 6.66 Parc Cwm Darran is located in the Darran Valley, just over 3km to the north of Bargoed and approximately 3km from the southern boundary of the site. The park is located on the site of the former Ogilvie Colliery where coal was mined for 50 years. Some remnants from its mining past are still visible, including the restored powder store, which was used to store dynamite.
- 6.67 The main access to the park is from the local road midway between Deri and Fochriw. The central feature of the park is the large man-made Ogilvie Lake, with open water areas and a wetland area for wildlife, surrounded by lakeside paths, woodland and the Cwmllydrew Meadows Local Nature Reserve. In addition the park offers a range of facilities including a healthy walking route, waymarked trails, cycle route, toilets, parking areas, picnic areas, an adventure playground, a campsite (seasonal opening) and a café. The park also offers opportunities for school and group visits.

⁸ www.breconbeacons.org (Business of Tourism)

- 6.68 The park is open all year, with the visitor centre, toilets and campsite open 7 days a week between Easter and October. The Lakes Coffee Shop is open Fridays to Tuesdays inclusive over the same period.

Darran Valley Cycle Route

- 6.69 This originally comprised a 7km route from Bargoed towards Fochriw on National Cycle Network (NCN) route 469, terminating near the Parc Cwm Darran visitor centre and café. Within Parc Cwm Darran the cycle route runs along the line of a disused railway and passes under a number of historic bridges and Ogilvie Lake in the centre of the park. In May 2012, a new walking and cycle path link between Fochriw and NCN469 was opened to improve access to the countryside for local residents and visitors to the area.

Parc Bryn Bach

- 6.70 Parc Bryn Bach is located between Rhymney and Tredegar to the south of the A465 Heads of the Valleys Road. It lies approximately 3km from the north-eastern boundary of the Nant Llesg site. The park is set within around 140ha of mixed grassland and woodland and has a lake as its focal point, over 14ha in size. It is open all year and entrance is free.
- 6.71 The park offers a wide range of informal recreational facilities, water sports and fishing together with a closed circuit cycling track. In addition there is a visitor centre, bunkhouse accommodation and a camping and caravanning site which offers a base for walkers and cyclists exploring the area, including the Brecon Beacons National Park north of the A465.
- 6.72 The park also includes the 9 hole, par 3 Parc Bryn Bach golf course, together with a 6-bay driving range and a pitch-and-putt area. These facilities are open to the public 7 days a week from 10am, with closing times varying according to the season. The course has views of the Rhymney Valley to the west.

Bute Town Reservoir

- 6.73 This 4ha reservoir, located approximately 500m from the northern edge of the Nant Llesg site, is maintained by Caerphilly County Borough Council and is used by the Rhymney and District Angling Society. Fishing for carp, bream, perch, roach, gudgeon, rudd and tench is allowed by permit holders only during the day, with night fishing only available to syndicate members.
- 6.74 A public footpath (Gelligaer FP 102) runs along the southern bank of the reservoir, which is well used by dog walkers.



Photo 6.4 Tarmac path along eastern side of Bute Town Reservoir linking to public footpath (Gelligaer FP 102) running along its southern edge

Fishing

- 6.75 Other water bodies located outside the site include the fishing lake (Pond Feeder) which is located to the west of Fochriw and is accessed from Gelligaer FP151 and the same car park on South Tunnel Road used by walkers to Rhaslas Pond. There is also a small reservoir north of Pontlottyn known as Bryn Brith Pond, leased to the Rhymney Angling Society, which is also a popular local destination from the nearby residential area.
- 6.76 Fishing is also available along the River Rhymney. A range of fish species are found along the length of the river and the river is stocked for fishing purposes⁹.

Tourist Resources

- 6.77 There are no tourist resources located on the site. There is a stainless steel arch sculpture, known as the Bent Iron, which sits in the highest area between Rhaslas Pond to the west and the Heads of the Valley Industrial Estate to the east. The Bent Iron by Godfrey Owen Phillips, commissioned by The Upper Rhymney Community Committee, was erected in 2005 as a replacement for an earlier 'bent iron' rail which commemorated the main product of the former Rhymney iron works. It is an important local landmark.
- 6.78 Outside the site there is a range of tourist resources, details of which are provided below (see Drawing MA/NL/ES/06/005).

Butetown

- 6.79 Butetown is part of a "model village" built in the early 19th century to provide quality housing for workers in the local ironworks. It was the brainchild of Richard Johnson, a local industrialist and manager of the Union Ironworks. The development is located at the top of the Rhymney Valley, and consists of three rows of 2/3 storey cottages. When it was built it also had community facilities such as a church (St Aidans), a post office and the former board school, currently used as a community centre. The village is designated as a Conservation Area. Johnson's original plan was for a larger development but this was not forthcoming following his death, leaving the small hamlet that remains today.
- 6.80 The Drenewydd Museum operated at the village until 2008 when it was closed due to comparatively low visitor numbers and the development of the County Borough museum at New Tredegar. The museum building has since been marketed by CCBC for residential use and there are no current plans to develop the tourism element at the site¹⁰.

Winding House, New Tredegar

- 6.81 Winding House is the new museum for the County Borough that is being developed at New Tredegar. The LDP at para 3.54 states that the museum is *"Located at the former Elliott Colliery pithead building, the museum will house a range of artefacts relating to the area's cultural and industrial heritage within a listed building, together with interpretative and exhibition facilities.*

⁹ The Rhymney Catchment Abstraction Management Strategy, March 2006

¹⁰ CCBC LDP Background Paper 11 'Tourism' (SB42), October 2008 (para 4.4)

This is a major element in the regeneration of the area and will hopefully be a catalyst for further investment.”

Parc Bryn Bach

- 6.82 Parc Bryn Bach, details of which are provided above under ‘Recreational Resources’, has been identified as a site for tourism related activities in the LDP for the county borough. In relation to the Heads of the Valleys Regeneration Area, the LDP states at para 3.53 that “It is proposed to further develop the tourism features around the park with additional facilities on nearby land, such as footpaths and increased access points linked to an afforestation scheme. Bryn Bach is likely to be one of the main park elements in the proposed Valleys Regional Park and could benefit from its close proximity to the Brecon Beacons National Park”.

Areas for Temporary/Permanent Public Access

- 6.83 Nine areas (Areas 6, 7, 8, 9, 10, 11, 12, 13 and 14) were considered as potential areas for temporary or permanent grazing and/or public access for the duration of the Project. Areas 6 and 13 were discounted since they fell within the areas of early remediation works described below. Area 14 is within the operational site area and has therefore been considered for permanent grazing/public access at the end of the Project, as described below. Area 10 was divided into three areas (10a, 10b and 10c). Area 10c was discounted as it had been identified as an area for ecological enhancement as described below. All areas are shown on Drawing MA/NL/ES/06/006) and are described below.

Area 7

- 6.84 This area, of approximately 13.5 hectares, lies to the south-west of Pontlloftyn and to the east of Fochriw (see Photo 6.5). It mainly comprises good quality semi-improved and improved grassland and can be accessed from the existing common land which lies immediately to the west and south or from public rights of way that lie adjacent to or cross the area. An existing track across the common runs from the Fochriw to Pontlloftyn Road to the west and south of this area, along which the Rhymney Valley Ridgeway Walk runs in part. Public footpaths also run to the immediate south and across the area to Pontlloftyn. It appears that the latter are well used by local residents.



Photo 6.5 View towards Pontlloftyn

Area 8

- 6.85 This area lies between the A469 and the access track/road across the common running south from Pontlottyn and is centred on the former settlement of Troedrhiwfuwch. It extends to over 58 hectares of predominantly good quality grazing with some steeper areas (see Photo 6.6), particularly in proximity to the disused quarry to the east of the area.



Photo 6.6 View from Area 8 looking west towards existing urban common

- 6.86 The main body of this area has no existing public access rights. However the Rhymney Valley Ridgeway Walk runs along the access track to the south-west, there is a public footpath crossing the southern corner towards the A469 down a very steep incline and there is a public footpath running along a track in the north-eastern corner. The existing common adjoins this area to the south-west, together with an area of open country (designated as access land under the CRoW Act) south-west of the A469 and the A469 along part of the north-eastern boundary.

Area 9

- 6.87 This area, of over 6 hectares, comprises a linear piece of land lying immediately north of the existing Merthyr Common and the Bargod Taf to the south of the FRLS. It joins the existing road to Bryn Caerau. There are no existing public access rights to this area.

Area 10

- 6.88 Area 10 is divided into two parts (10a and 10b) which comprise the higher, western areas of the Bryn Caerau farm holding.
- 6.89 Area 10a comprises improved grassland fields on the upper east facing slopes across to which there are no existing public rights of access. It extends to around 21 hectares. This area lies immediately to the east of the existing Merthyr Common. There are no existing public access rights to this area.
- 6.90 Area 10b, extending to approximately 26 hectares, also comprises improved grassland fields to the north of the road to Bryn Caerau and to the west of Nant Gyrawd. There are no existing public rights of access to this land and it links with the existing Merthyr Common along the southern boundary adjacent to the road.

Area 11

- 6.91 This area of land at Gilfach yr Encil is located on a west facing slope above Pentrebach and Troedyrhiw. It comprises a mixture of around 25 hectares of improved and less improved grassland, with some areas of bracken and some existing field boundary features (dry stone walling and low earth banks). The western part of this area is more steeply sloping and the whole area is surrounded by existing urban common land. It has open aspects, particularly to the north, south and west, with distant views of the Brecon Beacons (see Photo 6.7 below). There are no existing public access rights to this area.



Photo 6.7 View from Area 11 looking north

Area 12

- 6.92 This land at Pendducae Fawr is predominantly north-east facing with parts of the west being west facing. It extends to around 50 hectares. The majority of the land is gently sloping and comprises improved grassland fields grazed by sheep and cattle. Dry stone walls, mature tree lines, scattered scrub and hedges form the field boundaries. The steeper sloping banks along the eastern and western boundaries comprise bracken, scattered scrub and trees. The land lies immediately adjacent to the existing urban common land to the north, west and along part of its southern boundary. There are open aspects, particularly to the north, with distant views of the Brecon Beacons (see Photo 6.8 below).



Photo 6.8 View northwards from land at Pendducae Fawr

- 6.93 There are no existing public rights of way across this area, but informal routes exist along the access road to the farm and from that road along an existing track and local road to the A4054 in Troedryhiw. The route along the farm road is waymarked by signage as the 'Cross Valley Link' and the 'Cylchoedd-a-Dolenni' or 'Loops and Links' from the A4054. Tracks leading off the farm road, in the western area of the land are also waymarked. The Loops and Links is a network of over 250km of waymarked trails through the Merthyr and Rhondda Cynon Taff areas of South Wales which are designed to be used by walkers, cyclists and, wherever possible, horse riders¹¹.

Area 14

- 6.94 During the surface mining operations on the site, Area 14, a strip of land totalling 5.35 hectares along the disused railway cutting currently used as a waste disposal facility in the south-central area, would be covered by overburden. There is no existing public access to this area and it does not form part of the Gelligaer and Merthyr Urban Common.

Biodiversity Compensation Area

- 6.95 An area (Area 10c), part of Bryn Caerau Farm to the south west of the site, was assessed to be more suitable to implement ecological enhancements than to be used for temporary public access and/or grazing land for the duration of the Project. The land lies along the valley of Cwm Golau around the farm. The Bryn Caerau Biodiversity Compensation Area is shown on Planning Application Drawing MA/NL/PA/040. It extends southwards to the disused property of Begwns and northwards to the boundary of land forming part of the FLRS. The eastern boundary extends to a mineral railway leading to the Cwmbargoed Disposal Point (CDP) to the north and the western boundary extends to the boundary of Merthyr Common and further areas of farmland.

¹¹ <http://www.loopsandlinks.co.uk/> (last accessed 14.02.2013)

- 6.96 Much of the area is steeply sloping with more gently undulating areas at the top of slopes in the north and west (see Photo 6.9). The more gently sloping areas are enclosed by the remnants of hedgerows/tree lines and fences, and occasionally by stone walls.



Photo 6.9 View eastwards to the land for ecological enhancement at Bryn Caerau

- 6.97 There is currently no public right of access to this area apart from a public bridleway which runs along a track through the middle of the land holding to the farm buildings where it stops. This bridleway is shown on OS mapping as connecting with a bridleway to the east of the railway but it is presently obstructed where it passes under the railway and therefore not available for use (see Photo 6.10 below).



Photo 6.10 View eastwards under the railway from the public bridleway

Land Remediation Areas

- 6.98 Three main areas outside the area of the operational surface mine are included for land remediation and enhancement works in the early years (years 0-2) of the Project. These comprise the eastern area (including areas 6 and 13), the western area and the southern area which are described below (see Drawing MA/NL/ES/06/007).

Eastern Area

- 6.99 This area comprises a broad swathe of land running between the eastern operational boundary of the site and the Heads of the Valleys Industrial Estate, within which there are a large number of shafts in old mine workings and adits to those old workings. The area is shaded purple and yellow on Planning Application drawing MA/NL/PA/003, the yellow area being in the ownership of CCBC.
- 6.100 The southern part of this area is common land which adjoins the A469 to the north of Pontlottyn. Gelligaer BR89 runs from, and parallel to, the A469 across the common land to the Heads of the Valleys Industrial Estate road. Access to this bridleway is not signed or visible at either end. The remainder of the area mainly comprises rough grassland that generally slopes towards the industrial estate and is very steep and difficult to traverse in places. Outside the common land there is no public access in this southern area.
- 6.101 The northern part of this area lies outside the common land and comprises areas of grazing. The ends of some public footpaths that would be stopped up within the operational area cross this area, although they are generally not signed and difficult to locate on the ground.



Photo 6.11 View northwards within the eastern area

Western Area

- 6.102 This area runs alongside the Fochriw Road on the western side of the operational area of the site. It is shown shaded purple on drawing MA/NL/PA/003 and comprises grazing land on the urban common with some lengths of PRow. The 33kV overhead power line which currently crosses the operational area would be diverted at the start of operations and would then pass within this area.



Photo 6.12 View northwards within western area

Southern Area

- 6.103 The southern area comprises land in the ownership of Caerphilly CBC which lies to the north-west of Fochriw. Most of this area is within the Gelligaer and Merthyr urban common, with Gelligaer FP151 running southwards along a track from South Tunnel Road. The area mainly comprises rough grassland with some wet flushes across which there is an existing public right of access. The route of the dismantled railway also runs north-south along its eastern edge, although this is not designated as a public right of way.



Photo 6.13 Land for remediation within southern area

Medium and Long-term Temporal Change

- 6.104 The Ffos y fran Land Reclamation Scheme (FLRS) is operated by Miller Argent (South Wales) Limited. It is the third and final phase of the East Merthyr Reclamation Scheme and was granted planning consent in April 2005. Works on site commenced in June 2007 and are expected to continue until approximately 2024. The principal aim of the FLRS is to progressively restore the land to its former use as common and agricultural land. At this stage it is expected that, by the end of coaling around 2021/2022, around 87 hectares would have been restored and be within the after-care period. It is therefore anticipated that in advance of the completion of coaling at Nant Llesg in 2024, some of the urban common land on the FLRS site, where the rights of common are temporarily suspended, is likely to be re-established together with the right of public access.

Assessment Criteria and Assignment of Significance

Determining the Magnitude of Impacts

- 6.105 The significance of a potential effect on recreation and tourism is a function of the magnitude of the impact, the value or sensitivity of the resource or receptor and the timescale involved (permanent or temporary). The determination of the magnitude of impact on and sensitivity of recreational and tourist resources provided in this chapter have been informed by the guidelines set out in the DMRB Volume 11, Section 2, Part 5, HA 205/08.
- 6.106 These guidelines have been followed to determine the magnitude (or scale) of change (Adverse or Beneficial) on recreational and tourist resources shown in Table 6.2.

Table 6.2 Guidelines for determining the magnitude of effects on recreational and tourist resources

Magnitude	Description
High	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements; long duration of effect (Adverse); large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Medium	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements; medium duration of effect (Adverse). Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Low	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements; short duration of effect (Adverse). Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements; very short duration of effect (Adverse). Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).

6.107 In addition, a category of 'No change' may be used where there is no loss or alteration of characteristics, features or elements; or no observable impact in either direction.

6.108 In relation to the timescale or duration of an Impact magnitude, the following definitions have been used:

- **Permanent:** Beyond the lifetime of the Project;
- **Temporary - Short Term:** A period of months, up to one year;
- **Temporary - Medium Term:** A period of more than one year, up to five years;
- **Temporary - Long Term:** A period of greater than five years but not beyond the lifetime of the Project

Determining the Sensitivity of Receptors

6.109 Value or sensitivity relates to the importance of the recreational or tourist resource at national, regional and local levels. The guidelines set out in the DMRB have been followed to determine value or sensitivity as shown in Table 6.3.

Table 6.3 Guidelines for determining value or sensitivity for recreational and tourist resources

Magnitude	Description
High	High importance and rarity, national scale, limited potential for substitution.
Medium	High or medium importance and rarity, regional scale, some potential for substitution.
Low	Low or medium importance and rarity, local scale, potential for substitution.
Negligible	Very low importance and rarity, local scale, high potential for substitution.

Evaluation of the Significance of Effects

6.110 The likely environmental effects on recreational and tourist resources have been described and the significance evaluated in accordance with the significance matrix set out in Table 6.4 below.

Table 6.4 Significance Matrix

Magnitude	Value/Sensitivity			
	High	Medium	Low	Negligible
High	Major	Major or Moderate	Moderate or Minor	Minor
Medium	Moderate or Major	Moderate	Minor	Minor or Negligible
Low	Moderate or Minor	Minor	Minor or Negligible	Negligible
Negligible	Minor	Minor or Negligible	Negligible	Negligible

6.111 In determining the significance of the likely environmental effects on recreational and tourist resources, a qualitative judgement has been made in relation to the policy context and the baseline conditions. For the purposes of this assessment, the following definitions of significance have been used:

- Major significance: These beneficial or adverse effects are considered to be very important considerations.
- Moderate significance: These beneficial or adverse effects may be important. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
- Minor significance: These beneficial or adverse effects may be raised as local factors.
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

6.112 The cumulative effects of the Project, in conjunction with other projects have been considered, and, where relevant to this topic, are reported in this chapter of the ES. Further details of the schemes included in the cumulative assessment are provided in Chapter 4. Taking into account the wide range of existing outdoor recreational and tourist opportunities and resources within and nearby to this part of Caerphilly, this cumulative assessment has been based on the recreation and tourism study area and areas in close proximity to that study area, and guided by the need to consider 'likely significant effects' as defined in the EIA Regulations.

- 6.113 Regarding the amenity, or relative pleasantness, of a recreational or tourist resource or receptor, these issues are dependant largely on factors such as noise and visual effects. The assessments set out in Chapters 16 (Landscape and Visual Resources) and 13 (Noise), together with the assessment of effects on air quality set out in Chapter 12, have therefore been used, where appropriate, to provide a description of such effects.

Key Parameters for Assessment

- 6.114 The following assessment parameters for the Project set out in Table 6.5 below have been used in the assessment of effects on recreation and tourism and have been selected as those having the potential to result in the greatest effect on identified recreation and tourism receptors.

Table 6.5: Key Parameters for Assessment: Recreation and Tourism

Potential Impact	Maximum Parameter for Assessment	Comments
Temporary impacts on public access (PRoW & common land) arising during site enabling works, and from surface mining and ancillary operations within the operational area of the mine. (e.g. coal and overburden extraction; overburden, soils and peat storage; offices, car parking and access roads; workshops, barrel wash, coal stocking and lagoons) and during restoration of the site.	The maximum size of the operational area is 201 hectares.	Rights of access across the urban common land would be suspended during the mining phase & affected PRoW would be stopped up. Some PRoW would be reinstated within land to be remediated within the first 12-24 months of the Project (see below) or permanent diversions put in place to maintain access. The remaining PRoW would be reinstated during the restoration phase of the Project.
Temporary impacts on public access (PRoW & common land) arising from environmental and land remediation works within the site boundary but outside the operational area of the surface mine.	The maximum footprint of the land outside the operational area is approximately 114 hectares.	Rights of access across the urban common land would be temporarily suspended where environmental and land remediation works are located on common land & affected PRoW would be temporarily stopped up or diverted. Some PRoW would be reinstated within land to be remediated within the first 12-24 months of the Project, together with new linear routes.
Impacts (temporary and permanent) on public access (PRoW & common land) arising from additional grazing/access land outside the operational area of the mine, including impacts beyond the site boundary.	The maximum area of temporary grazing/public access land outside the application site is approximately 153 hectares.	Temporary areas for grazing and public access would be voluntarily provided for the total period of the Project. Areas totalling nearly 12 hectares would be available for registration as permanent urban common, with approximately 6 ha available from the commencement of the Project and the remainder available on completion of the Project.

Mitigation Measures Adopted as Part of the Project

Land Remediation Areas

- 6.115 Three main areas outside the area of the operational surface mine (eastern, western and southern areas) are included for land remediation and enhancement works in the early years (years 0-2) of the Project (see Drawing MA/NL/ES/06/007). These areas are described above under 'Baseline Environment'. Where these works are undertaken on areas of urban common the individual working areas would be temporarily fenced but public access would continue to be available to the remaining areas of the common.

Eastern Area

- 6.116 In the eastern area the proposed works would comprise the making safe of shafts and adits and undertaking landscape and ecological enhancements, including the establishment of a new linear recreational route. A permissive route would remain, subject to minor deviations to avoid works, until more permanent routes could be formalised upon completion of the remediation works, approximately 24 months from the commencement of coaling. This route would link with existing bridleways and cycle ways or minor roads, to mitigate for the temporary loss of rights of way stopped up for the duration of the Project. As described in the Public Rights of Way assessment section below, this bridleway would remain in place as a permanent additional public right of way following restoration of the site and would provide a varied route, sometimes open, sometimes enclosed in woodland, and would be signposted.

Western Area

- 6.117 The 33kV overhead power line which currently crosses the operational area would be diverted at the start of operations within this area. The diversion works would be fenced, as required, with public access to the common available outside the fencing. Following completion of the diversion works all of the common land within this western flank would be available for public access, providing unrestricted north-south pedestrian and equestrian access. It is anticipated that this would be in place within the first 12-24 months of the Project.

Southern Area

- 6.118 The proposed remediation works in this area comprise a drainage scheme to stabilise the former tip areas along the eastern edge on this area. Working areas would be fenced and there would be a temporary restriction on access to these areas of common land. Following completion of these works access to these areas of the common land would be reinstated within 12 to 24 months of the commencement of coaling. Other than the remediation of any shaft or adit along its route, the route of Gelligaer FP151 would not be affected by the majority of these works and would be retained as a permissive path, subject to minor deviations to avoid remediation works, along its existing alignment, with such route being formalised at the earliest opportunity once remediation works are completed.

Temporary areas for public access

- 6.119 Five areas (Areas 7, 8, 9, 11 and 12) have been identified to the south of the Nant Llesg site and to the west of the railway for temporary public access land for the duration of the Nant Llesg project (see Drawing MA/NL/ES/06/006). Each of these areas is described below. Areas 10a and 10b have not been taken forward as temporary areas for public access as part of the Project as they form integral parts to the Bryn Caerau farm holding. The remaining areas would provide a total of around 153 hectares of land for public access for the duration of the Project:

- Area 7: 13.5 hectares
- Area 8: 58 hectares
- Area 9: 6.18 hectares
- Area 11: 25 hectares
- Area 12: 50 hectares

Area 7

- 6.120 This area, of approximately 13.5 hectares, lies to the south-west of Pontlottyn and to the east of Fochriw. It provides a seamless addition to the existing common land and directly links with that part of the Gelligaer and Merthyr Common affected by the Nant Llesg project. It therefore provides a valuable temporary local recreational resource, close to the village and community of Pontlottyn.

Area 8

- 6.121 This area lies between the A469 and the access track/road across the common running south from Pontlottyn and is centred on the former settlement of Troedrhiwfuwch. It extends to over 58 hectares and provides a seamless addition to the existing common land and would be as suitable as that on the Nant Llesg site for public access. It directly links with that part of the Gelligaer and Merthyr Common affected by the Project and would provide a valuable additional access resource for local residents. It also lies approximately 1km to the north-east of Parc Cwm Darran, to which it would be linked by existing common land and public rights of way.

Area 9

- 6.122 This area, of over 6 hectares, comprises a linear piece of land lying immediately north of the existing Merthyr Common and the Bargod Taf to the south of the Ffos y fran Land Reclamation Scheme. Although this area would temporarily increase the area of urban common available for public access, it is steeply sloping to the fast flowing Bargod Taf, making it difficult for walking and horse riding. This area would also be available for grazing for the duration of the Project but this would have no significant effects on public access, since grazing and access already exist together on the existing urban common land.
- 6.123 This area would be put forward for registration as permanent common land at the commencement of the Project.

Area 11

- 6.124 This area totalling around 25 hectares at Gilfach yr Encil & Glinmil is located on a west facing slope above Pentrebach and Troedyrhiw and is surrounded by existing urban common land. It therefore provides a seamless addition to the existing common land and would be as suitable as that on the Nant Llesg site for public access. It does not directly link with that part of the Gelligaer and Merthyr Common affected by the Project but would provide a valuable additional access resource for the local residents of Pentrebach and Troedyrhiw in particular. There are a number of informal tracks across the adjacent common land which link to Area 11. Some of these tracks join the new Sustrans National Route 477 (NCN477), a traffic-free surfaced path which forms part of the Taith Trevithick Trail, at Pentrebach and Troedyrhiw.
- 6.125 This area would also be available for grazing but this would have no significant effects on public access, since grazing and access already exist together on the adjacent urban common land.

Area 12

- 6.126 This land at Pendducae Fawr is predominantly north-east facing with parts of the west being west facing. It extends to around 50 hectares. The land lies immediately adjacent to the existing urban common land to the north, west and along part of its southern boundary and therefore provides a seamless addition to the existing common land and would be as suitable as that on the Nant Llesg site for public access. It does not directly link with that part of the Gelligaer and Merthyr Common affected by the Project but would provide a valuable additional access resource for the local residents around Troedyrhiw in particular. It also links to the existing Loops and Links tracks. This area would also be available for grazing but this would have no significant effects on public access, since grazing and access already exist together on the adjacent urban common land.

Permanent areas for public access

- 6.127 Following completion of the surface mining operations, Area 14, a strip of land totalling 5.35 hectares which had been within the overburden mound, would be restored to grassland, along with the rest of the site. This area does not currently form part of the Gelligaer and Merthyr Urban Common but following restoration it would be put forward for registration as permanent common land and would provide a seamless addition to this public access resource.
- 6.128 As stated above, Area 9 would also be put forward for registration as permanent common land at the commencement of the Project.

Biodiversity Compensation Area

- 6.129 An area to implement ecological compensation is proposed in an area known as Cwm Golau to the south west of Nant Llesg. This area is described in the 'Baseline Environment' section of this chapter. The management proposals for the area would enhance the ecological value of the main habitats of interest in Cwm Golau, comprising woodland, grassland, water bodies and wetland areas and hedgerows and would also include works to dry stone walls and derelict buildings. As there is currently no public right of access to this area, it is proposed that managed permissive public access would be provided by means of a circular route through the various habitat types. This would be linked to the areas of common land to the west and the south and to the existing public bridleway, and interpretation boards would be provided at points along the route.
- 6.130 Further detail about the Biodiversity Compensation Area and the rationale behind its provision is provided in Chapter 8.

Environmental Assessment

- 6.131 The assessment of environmental effects on recreational and tourist resources during the lifetime of the Project takes into account the following key stages:
- **Site Establishment:** prior to the commencement of the mining operations a number of preliminary operations would be undertaken. These would include:

- (1) Site set up including the erection of boundary fencing following the formal stopping up of the public rights of way across the site and the receipt of consent to carry out works on the urban common;
 - (2) Diversion of the existing overhead power lines to land west of the operational site area;
 - (3) Construction of the water treatment facilities;
 - (4) Reducing the size of Rhaslas Pond;
 - (5) Construction of the accommodation and car parking area;
 - (6) Erection of on-site coal processing plant, internal roads, wash bays and weighbridge facilities; and
 - (7) Preliminary soil stripping and construction of soil mounds/baffle embankments.
- **Land Remediation Works:** These works would be undertaken in areas to the south, west and east of the operational area of the site and would include the surface treatment of land to address instability associated with old mine shafts and adits; drainage works and regrading to alleviate the scouring of old colliery tip material into the water course feeding Darren Park Lake; general tidying up and surface treatment of areas closest to settlements and the provision of additional public access resources in areas that would not be affected by the mining and associated operations. These works would be completed within 2 years of commencement of mining operations on the site.
 - **Waste Tipping:** Merthyr Industrial Services waste tipping operation along the disused railway cutting in the southern sector of the operational site could potentially continue up to the start of site operations. After this the land would be required for overburden storage. This land is not within the urban common and is not crossed by any public rights of way, so there would be no effects on recreational resources.
 - **Dispositions 1 to 5:** These are the five operational phases for the excavation and storage of overburden to expose the coal; the progressive extraction and processing of the coal for dispatch to market via the CDP; the progressive backfilling of the void behind the advancing coaling operations; the return of stored overburden to backfill the final void; and the preparation of the final land form. These are shown on the planning application drawing numbers MA/NL/PA/004-008.
 - **Operations at Cwmbargoed Disposal Point (CDP):** The existing CDP would accept the coal from the Project. Other operations undertaken at the CDP would include coal stocking; coal washing, processing and preparation for market; dispatch of coal by road and rail to market; water treatment facilities; use of railway sidings, coal lorry maintenance workshop, coal analysis laboratory, visitor/education centre, staff and operative accommodation/welfare facilities and car parking. The CDP lies on land where the rights of common have been suspended since 1957 and it is not crossed by any public rights of way, so there would be no effects on recreational resources arising from its use.
 - **Restoration of the land:** following the cessation of coaling the remaining void would be filled and the spreading of soils and soil-forming materials would be undertaken. In accordance with the restoration strategy, micro-topographical features would be formed; water and landscape features established; areas for ecological interest established; public rights of way and other linear routes reinstated or created and, following a period of after-care, the rights of access across the urban common reinstated.

- **Decommissioning of Cwmbargoed Disposal Point (CDP):** This would include the removal of all plant, machinery and buildings and the restoration of the land to urban common.

Common Land

Site Establishment and Dispositions 1 to 5 (see planning application drawings MA/NL/PA/004-008)

- 6.132 During the site establishment operations the operational boundary within which the coal extraction area, overburden storage area, peat storage areas, workshops, offices and barrel wash facilities are located, would be fenced. Access to these parts of the common would thus be prevented. Outside the operational boundary fencing the visual and acoustic bund would be constructed, the southern part of which would be located on the urban common, public access to which would also be prevented for the duration of the Project. Four water treatment areas, which would be enclosed by safety fencing, would be created, 2 of which would be located within the urban common but 2 of which would be located outside the urban common. No further areas of common land would be affected during the five phases of coaling (Dispositions 1 to 5), which would be undertaken within the operational boundary. The CDP, part of which is included within the application area is located on 23 hectares of urban common land, on which the rights of common have been suspended since 1957.
- 6.133 The area of common land within the fenced operational boundary and the visual and acoustic bund, forming part of the Gelligaer and Merthyr Urban Common (CL38) is 201 hectares. This represents approximately 6.5% of the total area of the Gelligaer and Merthyr urban common (3090 hectares) and around 3.5% of the total area of common and access land (5783 hectares) in the County Borough. In the northern part of the Gelligaer and Merthyr Urban Common 197 hectares are currently affected by the FLRS and the Trecatti Landfill, which are assessed as cumulative effects further below.
- 6.134 Consent to carry out the works on the common would need to be granted by the Welsh Ministers under s.38(1) of the Commons Act 2006. Schedule 1, Part 1, paragraph 5 of the Countryside and Rights of Way Act 2000 provides that land used for the getting of minerals by surface working is 'Excepted Land' for the purposes of Part 1 of the Act.
- 6.135 In making application to the Welsh Ministers under s.38 of the Act, Miller Argent is mindful that it would be conventional to erect a fence around the periphery of the application site area, given that only the general areas and locations that are required for remediation and power line diversion are currently known – greater precision can only be given once investigative works in individual locations take place. However, this would exclude public access and common grazing to the entire area for the duration of mining and land remediation; approximately 19 years for the operational surface mine and 12 to 24 months from the commencement of coaling for the peripheral remediation areas. This worst case scenario has been assessed in the EIA notwithstanding Miller Argent's intention to allow public access through the areas to the west, east and south of the site wherever possible, while works take place. Within these peripheral remediation areas, Miller Argent proposes to fence off only areas where and when remediation works and power line diversions are to be carried out; the remaining areas continuing to be available for common grazing and public access. This would significantly mitigate the impact of the remediation proposals within the peripheral areas.
- 6.136 To take account of and further mitigate any temporary loss of access rights to the urban common, five additional areas would be made available for public access to reduce the impact on common land for the duration of the Project. These comprise Areas 7, 8, 9, 11 and 12 described under 'Temporary areas for public access' above. Areas 7 and 8 comprise

approximately 72 hectares of land and the rights of public access would be the same as those existing on the site i.e. for air and exercise on foot and on horseback. The characteristics of these areas are similar to the site (upland grassland with open views), although they are partly enclosed with stone walls and fencing. These structures would remain in place but equestrian gates would be installed at appropriate locations to link with the adjoining common land and existing public rights of way. These areas are close to the settlements of Fochriw and Pontlloftyn and would therefore provide additional local access opportunities for residents and visitors alike. Areas 9, 11 and 12, covering approximately 81 hectares, are located to the west of the railway line and are therefore more remote from the villages around Nant Llesg. Nevertheless they provide additions to the area of the Gelligaer and Merthyr urban common over which there would be public access and link with existing common areas. They have similar characteristics as Nant Llesg, with wide ranging views and links to linear routes within Merthyr Vale.

- 6.137 An area of urban common land to the west of the operational boundary would be temporarily affected during the preliminary operations, as the existing overhead power lines across the common would be diverted within this area prior to the commencement of mining. This would require a temporary restriction on public access to the common. As these works would comprise one of the first operations to be undertaken on the site, access along public rights of way within the eastern boundary of the site would remain in place until the diversion is completed. On completion the right of public access to this area, totalling nearly 25 hectares, would be restored. This area would retain an important north-south link between the common land and public rights of way to the south and public rights of way and other linear recreational routes to the north.
- 6.138 The assessment of the impact arising from the temporary 19 year suspension of access rights to approximately 201 hectares of the urban common as a result of the Project, has taken into account the provision of around 153 hectares of land to which there would be public access for the lifetime of the Project, the location and characteristics of this land and the benefit that would accrue to local residents and visitors to the area. Recreation user surveys of routes across the urban common at Nant Llesg have indicated that existing use is low with most use occurring along the edge close to the settlements. The provision of Areas 7 and 8, in particular, for additional public access would therefore be of benefit to local residents and those using the existing track over the common land at this location. The other areas to be provided for temporary public access (Areas 9, 11 and 12) are located further away from the settlements around the site but would provide an additional local resource between the valleys of the River Rhymney and River Taff for local residents and visitors alike. The reinstatement of areas of common within the land remediation areas described below would also provide a local resource around the western, southern and part of the eastern boundaries of the site within 24 months of commencement of the Project. Considering these matters the magnitude of impact is assessed to be low since although there would be a temporary loss of the common land resource this would not adversely affect the integrity of the Gelligaer and Merthyr urban common as a whole and would, in any event, be reduced by the provision of alternative land for public access. Although the loss of the urban common would be for 19 years duration, the additional areas of temporary access land which have similar characteristics as the site will be provided for the duration of the impact. The sensitivity of the urban common is assessed to be high i.e. it is of high importance and rarity at a national scale with limited potential for substitution. The substitution of land equivalent to some 76% of the area suspended for public access is therefore of importance. The significance of effect on the Gelligaer and Merthyr urban common during the lifetime of the Project is therefore assessed as temporary, long term **Minor Adverse**.

Land Remediation Works

- 6.139 Land remediation works would be undertaken in three areas outside the operational area on the existing urban common. Works within an area of urban common totalling around 32 hectares to the east would include the surface treatment of the land to address instability associated with old mine shafts and adits, and the general tidying up of the area close to Pontlloftyn and

Rhymney. In addition works would be undertaken to improve public access opportunities in this area by minor diversions to public rights of way and the provision of new routes linking to the existing network. Individual working areas within the common would be fenced for the duration of these works to ensure public safety, with the public rights of access to these areas reinstated within the first 2 years of commencement of operations, together with access along the new routes. The intention however is for public access to be maintained to areas of the urban common outside the individual areas where works are carried out.

- 6.140 Works within an area of urban common totalling around 24 hectares to the west of the operational area would comprise the diversion of the existing 33kV overhead line. The diversion works would be fenced, as required, with public access to the common available outside the fencing. Following completion of the diversion works all of the common land within this western flank would be available for public access, providing unrestricted north-south pedestrian and equestrian access. It is anticipated that this would be in place within the first 12-24 months of the Project.
- 6.141 An area of urban common land totalling approximately 57 hectares is located to the south of the operational area. It is proposed to undertake drainage works in the south-eastern part of this area to address the scouring of old colliery tip material into the water course feeding the lake at Parc Cwm Darran and to locate and stabilise shafts and adits. These individual works would be temporarily fenced to ensure public safety but the residual area would remain open for public access. Once the works are completed, within the first 2 years of coaling operations, public access would be available across the whole of this area, although the intention is to keep public access around the works so far as is possible.
- 6.142 The magnitude of the impact arising from the temporary suspension of access rights to these land remediation areas, takes into account the provision of around 153 hectares of additional land to which there would be public access for the lifetime of the Project, the improvements to the land in terms of ease of public access and the length of time public access would be restricted. Recreation user surveys have indicated that existing use of the common is low with most use occurring along the edge close to the settlements or along existing tracks. Local residents would still have access to most of the urban common south of South Tunnel Road and also the area of common around the small reservoir to the west of Hill Road in Pontllynn. The duration of works in these areas would be undertaken within the first 12-24 months of coaling, after which access to the whole of these areas would be available. Taking into consideration these matters the magnitude of impact is assessed to be low since there would be a temporary short to medium-term loss of a small part of the common land resource. This would not adversely affect the integrity of the Gelligaer and Merthyr urban common as a whole. The sensitivity of the urban common is assessed to be high i.e. it is of high importance and rarity at a national scale with limited potential for substitution. The significance of the temporary effect of the land remediation works on the Gelligaer and Merthyr urban common is therefore assessed as temporary, medium-term **Minor Adverse**. This assessment is reached without taking into account the possibility of mitigation by way of access being maintained through individual areas while works are carried out, which would reduce the impact.

Restoration of the land

- 6.143 Following completion of the mining operations the site would be restored in accordance with the agreed restoration strategy, which has been developed following consultation with CCBC (see Drawing MA/NL/ES/06/009). The aim is to restore the site for informal recreational use, incorporating the common land (also used for common grazing), which would be re-established to reflect its current characteristics i.e. upland grassland with open views, with the rights of public access reinstated. A network of public rights of way across the common would also be created together with other linear routes to act as links between the already established facilities at Cwm Darren and Bryn Bach Country Parks. Important features such as Rhaslas Pond would be re-established and additional water features and areas of ecological interest created. The provision of public access would be sympathetic to both existing and new areas of

ecological, nature conservation and cultural heritage interest created or retained during the operational phase or retained or created or retained as part of the restoration scheme.

- 6.144 The following additional areas would also be put forward for registration as permanent common land, totalling nearly 12 hectares, which would increase the area of the Gelligaer and Merthyr Urban Common to 3101 hectares.
- Area 9 comprising 6.18 hectares to the immediate north of the existing common and south of the road to Bryn Caerau; and
 - Area 14 comprising 5.35 hectares along the disused railway cutting in the south-central area of the site.
- 6.145 The magnitude of the impact on the urban common compared to the current baseline environment would be low beneficial i.e. there would be an improvement in the quality of the common for recreational users with existing features enhanced and additional features or elements incorporated (e.g. Bent Iron on edge of common within a stone faced terrace and stone faced line marking the former edge of Rhaslas Pond) and there would be a small increase in the total area of the common. Links between the common and the adjoining areas would be improved as described under Public Rights of Way below. The sensitivity of the urban common is assessed to be high i.e. it is of high importance and rarity at a national scale as previously described. The significance of the permanent long-term effect of the restoration of the land on the Gelligaer and Merthyr urban common is therefore assessed as **Minor Beneficial**.

Decommissioning of CDP

- 6.146 Following the completion of the land restoration and after care works on the site, the CDP would be restored to urban common. It would link to other areas of the Gelligaer and Merthyr urban common in all directions and be restored in accordance with the agreed restoration strategy and the restoration requirements pertaining to the FLRS. The landscape characteristics would reflect the surrounding common land i.e. upland grassland and would include new water bodies and pedestrian routes linking to those outside the CDP. This restoration would bring approximately 23 hectares of land back into the urban common, approximately 0.7% of the total area of the Gelligaer and Merthyr Common.
- 6.147 The magnitude of the impact on the urban common takes into account the commitment to restore the CDP to common under the FLRS. Compared to this future baseline position the magnitude of the impact arising from the Project would be negligible. The sensitivity of the urban common is assessed to be high i.e. it is of high importance and rarity at a national scale as previously described. The significance of the permanent long-term effect of the restoration of the CDP to urban common as a result of the Project is therefore assessed as **Minor Beneficial**.

Public Rights of Way

Site Establishment and Dispositions 1 to 5 (see planning application drawings MA/NL/PA/004-008)

- 6.148 The operational boundary would be fenced during the preliminary operations and the public rights of way affected would be stopped up. No further public rights of way would be affected during the five phases of coaling (Dispositions 1 to 5), which would be undertaken within the operational boundary.

6.149 The following public rights of way, shown on Drawing MA/NL/ES/06/008 would be affected:

- Gelligaer FP86 would be stopped up from its junction with South Tunnel Road (point A) to its junction with the site boundary near to its junction with Gelligaer FP83 (point B), which would not be affected.
- Gelligaer FP90 would be stopped up from its junction with Gelligaer FP95 (point G) to the point where it ends just before the western site boundary (point Q), including the spur running northwards to its junction with Gelligaer FP97 (point R to point P).
- Gelligaer FP91 would be stopped up from its junction with Gelligaer FP95 (point I) to the site boundary (point H).
- Gelligaer FP95 would be stopped up from its junction with Gelligaer FP90 close to the eastern boundary of the site (point G), across the site to its junction with the western site boundary (point L).
- Gelligaer FP96 would be stopped up from its junction with Gelligaer FP95 (point J) to the south to the site boundary to the south of Upper Cwm Carno Farm (point K).
- Gelligaer FP97 would be stopped up from its junction with Gelligaer FP90 to the south (point P) to Gelligaer BR99 to the south of Upper Cwm Carno Farm (point O).
- Gelligaer BR99 would be stopped up within the site boundary (points M to N).
- Gelligaer FP100 forming two branches within the site boundary (points S and T) would be stopped up to the site boundary (points U and V) but would remain open west of the Fochriw Road.
- Gelligaer BR146 would be stopped up within the site boundary from its junction with Gelligaer FP151 (point AD to AE), a distance of approximately 15 metres, but would remain open between the site boundary and the Pentwyn – Dowlais Road.
- Gelligaer FP150 would be stopped up within the site boundary from its junction with Gelligaer FP151 (points Y to X) but would remain open west of the Fochriw Road.
- Gelligaer FP151 would be stopped up within the site boundary from South Tunnel Road to the south (point Z) to Fochriw Road to the north (point W).
- Gelligaer FP151 would be stopped up where it is located within the site, southwards from South Tunnel Road (point AA) to north of Pond Feeder (point AB) and from south of Pond feeder (point AC) the Fochriw-Bargoed Road (point AF). These southern sections would be re-established as a permissive path during the first 2 years of the Project following completion of the works on the shafts and adits around the old Fochriw colliery workings.

6.150 The short sections of Gelligaer FP95 and Gelligaer FP98 in the north-western corner of the planning application site area are outside the operational boundary and would not be affected by the project. They would therefore be fenced out of the operational area of the site along with the Alternative Highway 'Bridleway AH1' at the commencement of site establishment works.

6.151 Site surveys of the public rights of way network found that, with the exception of Gelligaer FP151, most of the public footpaths and bridleways across or proximate to the Nant Llesg site were both difficult to locate on the ground. A series of recreational surveys were undertaken during 2011 and 2012 to ascertain the level of pedestrian, equestrian and cycle use of the footpaths, bridleways and urban common potentially affected by the Project. These surveys indicated that the tracks to Rhaslas Pond and Pond Feeder and the edge of the common land

between Fochriw and Pontlloftyn/Rhymney are the most popular local resources for informal outdoor recreation. Outside the site the public footpath around Butetown reservoir (Gelligaer FP102) and those accessing the Rhymney Angling Club fishing lake at Pontlloftyn (Gelligaer FP83 and FP85) are also popular.

- 6.152 The Rhymney Valley Ridgeway Walk is an indicative line across the urban common within the Nant Llesg site, as it does not currently follow a public right of way in this location. It is currently difficult to locate and there is no clear route evident on the ground. At the southern end the Ridgeway Walk enters the common to the north of Fochriw and exits the Nant Llesg site through a newly planted hedgeline and then across Gelligaer BR93.
- 6.153 Within 24 months from the commencement of coaling new linear recreational routes would be put in place as part of the land remediation works described below. These would comprise a new public bridleway to link with the Rhymney Valley Ridgeway Walk south of the operational area and running north to link with Gelligaer BR89 and a new public footpath running north from Gelligaer BR89 on the edge of new woodland planting.
- 6.154 The assessment of the magnitude of the impact on public rights of way across the operational area takes into consideration the current level of use and access to alternative routes during the lifetime of the Project. It also has to take into account the provision of north-south and east-west pedestrian and equestrian access within the first 24 months of coaling operations. Considering these matters the magnitude of impact is assessed to be low since although there would be a temporary loss of public rights of way across the site, this would not adversely affect the integrity of the local public rights of way network. Furthermore, although the temporary loss of these public rights of way would be over a long duration, the local network would be enhanced by the provision of additional, waymarked routes within 24 months of the commencement of coaling. There are no national trails or regionally promoted routes across the site and therefore the sensitivity of these public rights of way is assessed to be low i.e. they are of low to medium importance and rarity at a local scale with potential for substitution. The significance of the temporary, long term effect on the public rights of way network during the lifetime of the Nant Llesg Project is therefore assessed as **Minor Adverse**.

Land Remediation Works

- 6.155 The land remediation works on land to the south of South Tunnel Road would require the stopping up of Gelligaer FP151 until the works on the shafts and adits have been located around the old Fochriw colliery workings have been completed. Once these features have been located, the intention is for discreet areas of remediation works to be fenced out of the common. It is intended that access to the common would remain, subject to minor deviations to avoid works. In these circumstances, there would be no restriction of public access between the remediation areas and therefore the stopping up of the footpath would have no significant effect on public access in this area. At most, the works would require minor diversions over common land where any remediation area lies over the route of this footpath. However, as set out above, the convention is for the whole area of the works to be fenced off, given that the individual locations of the works cannot be known without intrusive survey. Notwithstanding that Miller Argent does not intend fencing off the whole of the area, the assessment proceeds as if the whole area was not available, to ensure that the worst case is assessed. If Miller Argent are able to retain access through these areas, as is intended, this will further mitigate the impact.
- 6.156 On completion of the remediation works, this southern part of Gelligaer FP151 would be formalised by creation of a new path along an alignment suited to the topography.
- 6.157 The early remediation works in the area east of the operational area would require stopping up of existing public rights of way for the first 12 – 24 months of the coaling operations, as follows
- The eastern end of Gelligaer FP85 (approximately 50 metres from points C to D) would be permanently stopped-up and a permissive path provided in its place to avoid the works to

existing shafts/adits and to exit onto the dropped kerb onto the A469 opposite the waymarked Gelligaer FP88 on the northern side of the road. When the full extent of the necessary remedial works are known and the remediation works are complete, application will be made to CCBC to permanently create the alternative route as a public right of way on an alignment that avoids the remediation area.

- The southern end of Gelligaer BR89 is currently not accessible from the A469 or the roads through the Heads of the Valleys Industrial Estate. This public bridleway would therefore be permanently stopped-up (between points E to F) and a permissive path provided in its place that avoided any remediation works and exited onto the A469 at the same point as Gelligaer FP85, with an equestrian gate provided to access the Heads of the Valleys Industrial Estate road. Again, when the full extent of any remedial works are known and the remediation works are completed, application will be made to CCBC to permanently create a bridleway as a public right of way that avoids all remediation areas.
- Gelligaer FP95 running north from Gelligaer FP90 would be stopped up as part of the Project and would be replaced by a new bridleway route following new tree, woodland and hedgerow planting in accordance with the restoration plan linking with Gelligaer BR89 to the south and Gelligaer BR93 (outside the site) to the north. Part of this route would be available for permissive public access within the first 24 months of coaling. The remaining length of this new route of Gelligaer FP95, running west across the site, would be created during the site restoration works as part of the strategy to enhance the local PRoW network. The whole would be legally created as public rights of way on permanent alignments when the restoration and aftercare of the area was sufficiently advanced to permit such permanent routes to be created.
- Gelligaer FP91 in the northern part of this area would be permanently stopped up.

6.158 New permissive pedestrian and bridleway routes would be created in the area, in accordance with the agreed restoration strategy, that would be available within 2 years of the commencement of coaling. These comprise:

- A new public bridleway would be created to link with the Rhymney Valley Ridgeway Walk south of the operational area and running north to link with Gelligaer BR89 half way along the road through the Heads of the Valley Industrial Estate. It would also link to the proposed bridleway running along a similar alignment as the existing Gelligaer FP95.
- A new public footpath running north from Gelligaer BR89 on the edge of new woodland planting and up the stream valley to the edge of the common land. This would be extended to meet the re-aligned Rhymney Valley Ridgeway Walk on completion of the restoration works.

6.159 All routes so established would be legally created on permanent alignments when restoration and aftercare of the land was sufficiently advanced to permit such permanent routes to be created as outlined below.

6.160 Footbridges would be provided at stream crossings and kissing-gate type stiles or field gates would be provided at hedgerow crossings. Signposts and route markers would be provided at strategic points such as junctions of routes. Where there is access to features of particular ecological or cultural heritage interest, information signs would be provided.

6.161 The magnitude of the impact on the public rights of way within the land remediation areas takes into account the known safety hazards that have been identified within the areas (i.e. shafts and adits) through which existing routes run and the ability to access these routes, many of which are not possible to locate due to lack of signage. The duration of works in these areas would be undertaken within the first 2 years of coaling operations, after which access along permanent

routes would be available. This would enable the public to enjoy access to most of the remediated areas, with only relatively small areas fenced out for restoration/aftercare purposes e.g. landscape/ecological planting. The replacement network of PROW will be legally created when all impediments are removed. These routes would be permanently available and would provide additional pedestrian and equestrian resources within the local network. These would become part of the wider enhancements to the PROW network during the restoration of the site following the completion of coaling operations. Taking these factors into account the magnitude of impact is assessed to be medium beneficial as there would be additional features created and improvements to the quality and usability of existing diverted resources. There are no national trails or regionally promoted routes in this area and therefore the sensitivity of public rights of way is assessed to be low i.e. of low to medium importance and rarity at a local scale. The significance of the permanent effect of the land remediation works on public rights of way is therefore assessed as **Minor Beneficial**.

Restoration of the land

- 6.162 Following completion of the mining operations the site would be restored in accordance with the indicative restoration strategy for the site (shown on drawing MA/NL/ES/16/012-2), which has been developed following consultation with Caerphilly CBC.
- 6.163 The restoration of the site would be progressive, spanning several stages of restoration. For each stage a detailed restoration design and aftercare scheme would be submitted to Caerphilly CBC for approval in advance of restoration works. The creation of public rights of way would form part of the detailed restoration designs, which are set out in principle in the restoration strategy for the site.
- 6.164 The aim is to restore the site for informal recreational use, which would include the provision of the public rights of way to replace those that had been stopped up, including those across the urban common, and the creation of new public rights of way. Some of these new routes would provide linear links between the already established facilities at Cwm Darran and Bryn Bach Country Parks and also reinstate and enhance the well-used local route to and around Rhaslas Pond. These public rights of way would be established so as to maintain and improve upon the connectivity of the local network and the restoration proposals in this respect have been agreed with CCBC. As described above, with these new public rights of way, provision of public access would be sympathetic to both existing and new areas of ecological, nature conservation and cultural heritage interest retained or created as part of the restoration scheme. Footbridges, stiles (kissing gates and stone stiles), field gates and signage would be provided, together with interpretative boards where there is access to features of particular ecological or cultural heritage interest.
- 6.165 New public rights of way would be created following completion of the restoration of the land and the after-care period to replace those stopped up during the lifetime of the Project, indicative alignments of which are shown on Drawing MA/NL/06/009, as follows.
- Gelligaer FP85: a new route 'A' would be created to link with the existing length of FP85 outside the site to the south and with the road on the western side of Capital Valley Industrial Estate.
 - Gelligaer FP86: a new route 'B' would be created along a similar west to east route as its current alignment from its junction with new route 'K' immediately to the north of South Tunnel Road, linking to and crossing new route 'O' to join the existing Gelligaer FP86 at the site boundary immediately west of its junction with Gelligaer FP83.
 - Gelligaer BR89: a new route 'C' would be created along a similar north-south route as its current alignment from where it enters the site south of its junction with the road through

the Heads of the Valleys Industrial Estate to its junction with the road on the western side of Capital Valley Industrial Estate.

- Gelligaer FP90, FP97 and FP100: a new route 'D' would be created along a similar general east-west route as the current alignment of the eastern section of Gelligaer FP90, linking to and crossing the new bridleway 'K' before turning north to replace Gelligaer FP97 and meet new route 'G' that replaces Gelligaer FP95. A new route 'H' would replace the westerly leg of Gelligaer FP 90 and extend from its junction with new route 'D' in a south-westerly direction to replace Gelligaer FP100 and link with the existing Gelligaer FP100 at the site boundary.
- Gelligaer FP95: a new route 'E' would be created along a similar east-west route as the current alignment of its more easterly section, except for the south-easterly part that runs to the west of the Heads of the Valleys Industrial Estate, would be replaced by a new bridleway 'P' during the land remediation works, as described above. The westerly section of Gelligaer FP95 would be replaced by new route 'G' that would run in a south-westerly direction to join route 'D' mentioned above.
- Gelligaer FP96: a new route 'F' would be created along a similar route as its current alignment, following field boundaries to a point where it leaves the site southeast of its junction with Gelligaer BR93.
- Gelligaer BR146: a new route 'U' would be created along a similar route as its current alignment within the site boundary linking with route 'J' (replacing Gelligaer FP151).
- Gelligaer FP150: a new route 'I' would be created along a similar route as its current alignment within the site boundary linking with new route 'J', which replaces Gelligaer FP151 and running in a westerly direction to meet the existing length of Gelligaer FP150 at the site boundary.
- Gelligaer FP151: a new route 'J' would be created along a similar route as its current alignment within the site boundary between South Tunnel Road to the south and Fochriw Road to the north. This would link to cultural heritage features associated with the Dowlais Free Drainage System to the west of the site. A new route 'J' would also be created along a similar route to its current alignment within the site boundary to the south of South Tunnel Road from its junction with the road in a general south-south-easterly direction to link with new route 'U' before linking to the existing Gelligaer FP151 at the most southerly site boundary west of Fochriw.

6.166 It is proposed to create a number of other public rights of way as part of the restoration of the site, in addition to those outlined under 'Land Remediation Works' above. These comprise:

- The creation of a new bridleway 'K' running along the alignment of the dismantled railway between Fochriw in the south and new route 'L' (Bridleway AH1) created at the commencement of site operation to extend bridleway Gelligaer BR93 along the northern boundary of the site. At the southern end and beyond the site boundary, the route would link via Railway Terrace in Fochriw to link to the national cycle route (NR469) at Pontlloftyn Road. South of the Pontlloftyn Road NR469 runs along Glan-y-Nant to the traffic-free section to Parc Cwm Darran, through Deri and to Bargoed, where it meets NR468, a traffic-free riverside path. At the northern end, new bridleway 'K' would link to the extended Gelligaer BR93 (new route 'L'), which links to the NR468 at its eastern end where there is a traffic-free path on the pavement. Just south of the A465 'Heads of the Valleys Road', NR 468 joins NR46, a predominantly traffic free path between Merthyr Tydfil and Brynmawr, from where it continues east along a traffic-free former railway path. In addition to providing a new long north-south route across the common, this new route would also

facilitate new links to the national cycle network and key local facilities such as Parc Cwm Darran.

- North and east of the reinstated Rhaslas Pond, two new footpaths ('M' and 'N') would be created: new route 'M' along the northern edge of the reinstated pond, following the line of its original northern embankment and linking with new route 'J' to the west; and new route 'N', linking with the new north-south bridleway 'K' mentioned above, in two locations forming a loop around a proposed new water feature.
 - The Rhymney Valley Ridgeway Walk currently does not follow public rights of way across the site and therefore a new north-south public bridleway 'O' would be created, along which the Ridgeway Walk would run. This route would follow the topography created during the land restoration and micro-topographical features such as the stone faced terrace on the edge of the common featuring the 'Bent Iron'. It is proposed that the route would also be marked by waymark cairns at key locations. On the southern boundary of the site the route would link to the urban common just north of Fochriw and also to the new bridleway 'P' created on the eastern valley slopes during the early land remediation works and onwards to the national cycle network along NR468. As described above, it would also link to new route 'B' which replaces Gelligaer FP86. A new bridleway 'Q' would be provided from the new bridleway 'P' and run along the eastern slopes in a general easterly direction to the A469 west of Capital Valley Industrial Estate, north of Pontllynn.
 - A new footpath 'R' would be created running north-east from the new route 'O' (the Rhymney Valley Ridgeway Walk) off the urban common to link to new bridleway 'P' and existing public rights of way to the west of the Heads of the Valleys Industrial Estate.
 - A new footpath 'S' would be created from a point on new route 'J' just south of Rhaslas Pond in a south-westward direction to link to Fochriw Road and public rights of access beyond the site to the west.
 - A new footpath 'T' would be created from Fochriw Road across the restored area of the CDP to link with the urban common to the west.
 - A new footpath 'V' would provide a link southwards from new footpath 'T' to link with existing footpath Gelligaer FP147 to the south of the CDP.
 - A new footpath 'W' would provide a link in northwards from new route 'J' which replaces Gelligaer FP151 and common land beyond the site boundary.
- 6.167 The magnitude of the impact on the public rights of way network compared to the current baseline environment would be medium beneficial i.e. there would be an improvement in the quantity, quality and type of the public rights of way available for recreational users with links established to the wider Sustrans national cycle network and key local facilities such as Parc Cwm Darran. Links between the common and the adjoining areas would be also improved by the provision of the new routes. The sensitivity of the public rights of way is generally assessed to be low i.e. of low to medium importance and rarity at a local scale, although the value of traffic-free links to the Sustrans national cycle network would be of greater than local significance and is therefore assessed to be medium. The significance of the permanent long-term effect of the restoration of the land on the public rights of way network is therefore assessed as **Minor to Moderate Beneficial**.

Recreational Facilities – Rhaslas Pond and other Water Bodies

Site Establishment and Dispositions 1 to 5 (see planning application drawings MA/NL/PA/004-008)

- 6.168 In addition to the public access resources described above, the only facility located on the site or within the areas identified for temporary access and grazing that has a recreational function is Rhaslas Pond. During the preliminary works for the Project the size of Rhaslas Pond would be reduced and the site fenced. Workshops would be erected to the north west of the reduced waterbody and barrel wash facilities located in the former northern part of the pond. These would be required for the duration of the five phases of excavation during Project. Therefore there would be no public access to this area for approximately 19 years.
- 6.169 The assessment of the magnitude of the impact on Rhaslas Pond, as a recreational facility, during the mining operations is assessed to be high, as the works would result in the long-term temporary loss of this resource. The assessment of the sensitivity of Rhaslas Pond takes account of its importance and rarity, and the potential for provision of an alternative facility during the lifetime of the Project. It was stated by respondents at community consultation events that Rhaslas Pond is an important local resource and this is also acknowledged by CCBC and confirmed by the public rights of way user surveys undertaken. However, there are alternative facilities in the immediate area that are also well used by local residents. These include the fishing lake (Pond Feeder) to the west of Fochriw that is accessed from Gelligaer FP151 and the same car park on South Tunnel Road used by walkers to Rhaslas Pond. The small reservoir north of Pontllynn known as Bryn Brith Pond and the Butetown Reservoir, both leased to the Rhymney Angling Society, are also popular with walkers. The sensitivity of Rhaslas Pond is therefore assessed to be low i.e. of low to medium importance or rarity at a local scale and with potential alternatives. The significance of the temporary, long-term effect on Rhaslas Pond during the lifetime of the Project is therefore assessed as **Moderate Adverse**.
- 6.170 There would be no direct effects on any recreational facilities outside the site during the lifetime of the Project except for potential effects on some water-based recreational activities arising from the following water management measures undertaken as part of the Project. It is anticipated that the water management procedures put in place for Nant Llesg would improve water quality and therefore may result in positive impacts on local recreational fishing. Chapter 11 'Hydrology and Drainage' of the ES provides details of the waterbodies and rivers/ streams that lie within the catchment area of the site or which may receive water from water sources draining or receiving runoff from the Project. It explains at para [1.32] that the Project "*falls within the Water Framework Directive (WFD, Directive 2000/60/EC) surface water body known as "Rhymney R - source to confluence with Nant Bargoed Rhymni (GB109057033130"* and states that this water body currently has been rated as having a "moderate" ecological status based upon the reduced health of the river's fish stocks. The hydrogeological impact assessment concludes that there would be a temporary but "*significant*" benefit during the operational phase of the site by intercepting and treating Dowlais Free Drainage System (DFDS) waters before they are returned to the River Rhymney. Potential effects on fish species arising from changes to the ecology of watercourses are described in Chapter 8 'Ecology' of the ES which states that the improvement in water quality is likely to be beneficial to fish.
- 6.171 The magnitude of the impact on these water bodies, as recreational facilities, both during and after the cessation of the mining operations is assessed to be medium, as the works would result in a long-term permanent benefit. The assessment of sensitivity takes account of their importance and rarity. They are mostly of local importance, except for facilities such as Parc Cwm Darran which attracts visitors from a wider area on account of the additional facilities that they provide e.g. camp site and visitor centre. The value or sensitivity of these resources is therefore assessed to be low i.e. generally of low to medium importance or rarity at a local scale and with potential for substitution. The significance of the long-term, permanent effect on the use of these water bodies as a result of improvements to water quality is therefore assessed as **Minor Beneficial**.

Land Remediation Works and Restoration of the land

- 6.172 The proposed remediation works to the south of South Tunnel Road include a drainage scheme to stabilise the erosion of former tip areas along the eastern edge on this area. It is anticipated that these works may reduce the quantity of silt being carried downstream by the Nant Bargod Rhymni to the lake in Parc Cwm Darran to the south of the site, which may have a benefit to this recreational resource.
- 6.173 Following the cessation of coaling the final void would be filled and, in accordance with the restoration strategy, Rhaslas Pond would be re-established. The existing earth dam to the south of the pond would be protected during mining operations and the former outline of the northern embankment re-instated. In addition, a new footpath (J) would be created running along the northern side of the water body following a stone marked and raised feature marking the position of the northern embankment of the former Rhaslas Pond edge. This would link to other linear routes across the common, including the proposed bridleway (H) following the line of the disused railway.
- 6.174 There would be no direct effects on any recreational facilities outside the site as a result of the restoration of the land except for potential effects on some water-based recreational activities arising from an improvement in water quality. Chapter 11 'Hydrology and Drainage' concludes that there would be a long-term, minor benefit to water quality arising from the removal of contaminated coal seams and by the implementation of a suitable backfill strategy, approved by Natural Resources Wales. Chapter 8 'Ecology' states that, overall, the effects of restoration on fish compared to the current baseline are assessed as being beneficial.
- 6.175 The magnitude of the impact on these recreational resources during land remediation works and following the cessation of the mining operations is therefore assessed to be negligible, with their value or sensitivity assessed to be low i.e. of low to medium importance at a local scale. The significance of the permanent, long-term effect on Rhaslas Pond and other water bodies outside the site as a result of the land remediation works and the restoration of the land is therefore assessed as **Negligible**.

Tourist Resources

Preliminary Operations and Dispositions 1 to 5 (see planning application drawings MA/NL/PA/004-008)

- 6.176 No tourist resources are located within the Nant Llesg operational area and there would be no direct effects on those resources outside the area during the operational phase of the Project. The Bent Iron, a well-known landmark, which could be considered as a visual marker for visitors to the area, would be taken down and either stored or temporarily re-located, at a location agreed in consultation with The Upper Rhymney Community Committee. Overall, the magnitude of the impact on tourist resources in the local area is therefore negligible, with the Bent Iron considered to have low sensitivity i.e. important at a local scale. The significance of the temporary, long-term effect on tourist resources during the operational mining phase of the Project is therefore assessed as **Negligible**.

Restoration of the land

- 6.177 In terms of recreation and tourism, CCBC have stated that they wish to see the site restored for informal recreational use, as it is currently i.e. urban common with natural landscape features and linear recreational routes which link to the wider local and regional network. As part of the restoration strategy there would therefore be improved public access to and across the site and enhanced links between the site and existing recreational resources such as Parc Cwm Darran.

In addition, the Rhymney Valley Ridgeway Walk would be created along a new public bridleway providing links to the existing national cycle route network. The restoration strategy would also put in place ecological and cultural heritage enhancements, including seating and information signs around old shafts/adits. During the restoration of the land the Bent Iron would also be reinstated on the edge of the urban common within a stone faced terrace but, in line with CCBC's vision for the site, no formal tourist resources would be provided.

- 6.178 The magnitude of the impact on tourist resources after the cessation of the mining operations is therefore assessed to be negligible, with the Bent Iron and the introduction of heritage features is considered to have a low sensitivity i.e. important at a local scale. The significance of the permanent, long-term effect on tourist resources as a result of the restoration of the land is therefore assessed as **Negligible**, which is not significant in EIA terms.

Cumulative Effects

- 6.179 An assessment of the cumulative effects on recreation and tourism arising from the Project and other projects in the area has been undertaken, taking into account the following:

- FLRS
- Trecatti Landfill Site

- 6.180 Merthyr Industrial Services, who run an inert waste landfill operation along the alignment of the former railway line, would continue to operate this facility until the commencement of operations on the site. There are no recreational or tourist resources within this area and therefore these tipping operations have not been included in the cumulative impact assessment.

- 6.181 There are two areas of the Cwmbargoed Disposal Point which lie within the county borough of Merthyr Tydfil which are beyond the planning application site boundary. The area to the north-west partly comprises undisturbed open grassland that has been fenced out of the operational area of the CDP, despite being included within the planning application boundary for the CDP. There is little operational activity within this area apart from vehicle movements via the Bogey Road crossing point. The western part of this area is urban common, over which there is an extant right of public access and that will remain the case. The southern area includes part of the CDP water treatment area, an area for coal stocking and a baffle embankment. There are no existing rights of public access to this southern area. Overall, these areas within the CDP but beyond the planning application boundary have no effects on existing recreational resources and therefore have not been included in the cumulative impact assessment.

- 6.182 There is a public footpath (Gelligaer FP88) which runs along the western boundary of the site of the recently permitted wood pellet manufacturing facility at Unit 6 Capital Valley Eco-Park, Rhymney. This footpath is not affected by these proposals or the Nant Llesg project and therefore this development has not been included in the cumulative impact assessment.

Common Land

Ffos-y-fran Land Reclamation Scheme

- 6.183 The FLRS is the last and largest of the original three phases of the East Merthyr Reclamation Scheme and, on completion, would restore 367 hectares of derelict land, including around 251 hectares of urban common in the northern part of the Gelligaer and Merthyr Urban Common. The reclamation works include the removal of known shafts and adits previously associated

with iron ore and coal workings. Works on site commenced in June 2007 and will span 17.5 years until 2024. Following restoration there would be an after-care period of at least 5 years.

- 6.184 The principal aim of the FLRS as described on the project website (<http://www.millerargent.co.uk/restoration>) is *“to progressively restore the land to its former use, to a simple landform and landscape, characteristic of this area; void of dereliction, and incorporating certain features retained for various reasons throughout site operations; and recreating others that are presently considered to be of notable interest. A number of enhancements are also planned for the site to complement the original uses. The land reclamation will commence in year eight of the project and will then continuously progress with the movement of the excavation throughout the scheme”*.
- 6.185 For the duration of coaling works at FLRS the rights of public access to the urban common within the site are suspended and would be re-instated progressively following the restoration of the site and during after-care. The rights of access to the whole area of urban common affected by the FLRS scheme would be reinstated following completion of the after-care by 2029, with some areas being available prior to that date following early restoration works.
- 6.186 Whilst additional areas of land have been provided for temporary grazing for the duration of the FLRS, there are no rights of public access to this land. Therefore the rights of public access to a maximum of 251 hectares of urban common would be suspended until 2029, an area equating to approximately 8% of the area of the Gelligaer and Merthyr Urban Common.
- 6.187 The FLRS and the Project would therefore together affect nearly 452 hectares of urban common land, amounting to nearly 15% of the total area of the Gelligaer and Merthyr Urban Common (3090 hectares) up until 2029. Thereafter, between 2019 and 2032, only the right of public access to the common land resulting from the Project would be suspended (i.e. approximately 201 hectares). It is anticipated that all of the urban common impacted upon by the Project would be reinstated by 2032 after a minimum 5 years of after-care.

Trecatti Landfill Site

- 6.188 Trecatti is an operational landfill site which is safeguarded under the Merthyr Tydfil CBC (MTCBC) Local Development Plan Policy AS7 for unavoidable waste. It is acknowledged by MTCBC that “The demanding requirements of the National Waste Strategy and EU Directives have resulted in a shift from sending waste to landfill to managing it in a more sustainable manner. This new approach requires waste to be reduced at source and then treated as resource through re-use, recycling, composting and energy recovery. T”. The demand for landfill has reduced accordingly and it is therefore expected that the Trecatti site will remain in operation for unavoidable waste for around another 25 years.
- 6.189 Trecatti is located on the Gelligaer and Merthyr urban common and the rights of public access over approximately 35 hectares are suspended as a result of the current operations. No public access has been available on this site since works commenced in the mid 1970’s and these rights are unlikely to be reinstated before 2032, after both FLRS and the Project become available for public access. The combined effect on common land forming part of the Gelligaer and Merthyr Urban Common arising from Trecatti, FLRS and the Project is therefore 487 hectares or 15.73%.

Cumulative Effect

- 6.190 The magnitude of the impact arising from the temporary suspension of access rights to a combined maximum area of nearly 487 hectares of the urban common, mostly located within the northern area of the Gelligaer and Merthyr Urban Common, as a result of the Nant Llesg project, together with the FLRS and the Trecatti Landfill Site, has taken into account the current level and nature of use of this land, the provision of around 153 hectares of land to which there would be public access for the lifetime of the Project, the location and characteristics of this

land and the benefit that would accrue to local residents and visitors to the area, as described in the assessment above. It also takes into account those areas of common land that would be available for public access running along both sides of the Fochriw Road, land to the south of South Tunnel Road and to the east of the scheme (parts of which will be impacted by land remediation works) and the alternative access provisions that would be incorporated into the Project. Considering these matters the magnitude of impact on public access is assessed to be low since although there would be a temporary loss of the common land resource from both FLRS, Trecatti and the Project within the northern area of the Gelligaer and Merthyr urban common, these impacts would be reduced by the measures incorporated into the Project and would not affect the integrity of the common as a whole or the extensive common land resource within Caerphilly, Merthyr or the surrounding districts. The combined loss of the urban common would be over a long duration, but the additional areas of temporary access land that would be provided by the Project that would benefit residents in, and visitors to, the Merthyr Tydfil and Rhymney areas. The sensitivity of the urban common is assessed to be high i.e. it is of high importance and rarity at a national scale with limited potential for substitution. The significance of the temporary, long-term cumulative effect on the Gelligaer and Merthyr urban common during the lifetime of the Project is therefore assessed as **Minor/Moderate Adverse**.

Public Rights of Way

Ffos-y-fran Land Reclamation Scheme

- 6.191 As part of the restoration proposals for FLRS a footpath and bridleway network would be provided to complement the public right of access for air and exercise over the urban common. As there are no registered rights of way shown across the common on the Council's definitive map, the route would recognise unregistered routes referred to as 'claimed footpaths' and shown on the local authority's draft or working copy of the definitive map. The proposed alignment would provide a similar network to that of the claimed footpaths, whilst being adjusted to reflect the new site contours, landscape features and the absence of dereliction across the site. Similarly, additional footpaths would be created over the areas that are not common land to complete the proposed network.
- 6.192 Surveys undertaken prior to the commencement of works at FLRS demonstrated that the routes of the 'claimed footpaths' across the site were not evident on the ground and that there was little evidence of use.
- 6.193 During the working of the site, an alternative temporary route has been provided between the FLRS and Trecatti sites to enable east-west access for the public between Fochriw Road and the A4060.

Trecatti Landfill Site

- 6.194 PRoW across the operational Trecatti site have been stopped up since the mid 1970's and are likely to remain so until at least 2028, after public rights of way across both the FLRS and the site become available for public access as part of the restoration strategies for the two sites. North of the Trecatti site public footpaths (including Gelligaer FP95, 98 and 100) enter the urban common from the Fochriw Road and styles are in place along the road to enable access.

Cumulative Effect

- 6.195 The assessment of the magnitude of the cumulative impact on public rights of way arising from the Project, together with FLRS and Trecatti, takes into consideration the current level of use, the availability of access to alternative routes during the lifetime of the Project and the provision of around 153 hectares of land to which there would be public access for the lifetime of the

Nant Llesg project, together with recreational access provided within the land remediation areas within 2 years of commencement of coaling. In relation to existing use, the recreational survey of the site showed that the current levels of use are low. This is despite there being no access to public rights of way or claimed routes that have been stopped up across the FLRS and Trecatti. Taking these factors into account the magnitude of cumulative impact is assessed to be low since although there would be a temporary cumulative loss of public rights of way arising from the 3 projects, public access would still be available using public rights of way around these sites and linking to the wider local network. Furthermore, although the temporary cumulative loss of these public rights of way would be over a long duration, the local network would be enhanced by the provision of additional, permissive waymarked routes within 2 years of commencement of coaling operations. There are no national trails or regionally promoted routes across these sites and therefore the sensitivity of these public rights of way is assessed to be low i.e. they are of low to medium importance and rarity at a local scale. The significance of the temporary, long-term cumulative effect on the public rights of way network is therefore assessed as **Minor Adverse**.

Inter-relationships and in-combination effects

- 6.196 There are no inter-relationships between Recreation and Tourism and other EIA topics that have not already been considered. There are no in-combination effects that have not been considered.

Summary and conclusions

- 6.197 The proposed Nant Llesg Surface Mine including Land Remediation is partly located on the Gelligaer and Merthyr Urban Common (CL38) over which the public have a right of access over for air and exercise on foot and on horseback. In addition, public access is available along a number of public rights of way which cross the site and to locations such as Rhaslas Pond. Beyond the site recreational and tourist facilities include those within the Brecon Beacons National Park, Parc Cwm Darran, Parc Bryn Bach and at Bute Town Reservoir. These resources have been identified through desk studies and surveys and discussed with consultees including Caerphilly County Borough Council (CCBC).
- 6.198 The assessment of environmental effects on recreational and tourist resources during the lifetime of the Project takes into account the following key stages:
- Site establishment i.e. the preliminary operations required prior to the commencement of the mining operations, including the stopping up of public rights of way and the receipt of consent to carry out works on the urban common;
 - Land remediation works to the south, west and east of the site to address, amongst other things, instability associated with old mine shafts and adits;
 - The five operational phases for the progressive extraction and processing of the coal;
 - Operations at the existing Cwmbargoed Disposal Point and its decommissioning; and
 - The restoration of the land in accordance with the agreed restoration strategy, which has been developed following consultation with CCBC.

Mitigation Measures Adopted as Part of the Project

- 6.199 Mitigation measures that have been included within the project design have been taken into account in the assessment of potential effects on recreational and tourist resources arising during the key stages of the proposed Nant Llesg Surface Mine project. These include:
- Land remediation areas outside the area of the operational surface mine where works would include the making safe of shafts and adits in the first two years of the Project, together with the establishment of new permissive recreational routes;
 - Temporary areas for public access to the south of the Nant Llesg site and to the east and west of the railway which would provide a total of around 153 hectares of land for public access for the duration of the Project;
 - Permanent areas for public access comprising one area that would be put forward for registration as permanent common land at the commencement of the Project and one following completion of the mining operations; and
 - An area for ecological compensation at Cwm Golau to the south west of Nant Llesg, where managed permissive public would be incorporated with the ecological management proposals.
- 6.200 The assessment does not include Miller Argent's intention to retain access throughout these land remediation works to the south, west and east of the site. Convention dictates that the whole of the area is shown as being fenced off in the application under s.38 of the Commons Act 2006, but it is not Miller Argent's intention to restrict access completely, and if this can be achieved, it will, further mitigate impacts beyond those assessed.

Key Findings

Common Land

- 6.201 During site establishment the operational boundary within which the coal extraction area, overburden storage area, peat storage areas, workshops, offices and barrel wash facilities are located, would be fenced and access to these parts of the common, totalling 201 hectares, would thus be prevented. No further areas of common land would be affected during the five phases of coaling undertaken within the operational boundary. The area of common land within the fenced operational boundary represents approximately 6.5% of the total area of the Gelligaer and Merthyr urban common (3090 hectares) and to take account of the temporary suspension of access rights to the urban common, additional areas totalling around 153 hectares would be made available for public access as described above. It has therefore been assessed that the temporary, long-term effect arising from the 19 year suspension of access rights to approximately 201 hectares of the urban common as a result of the Project would be **Minor Adverse**. The impacts on common land arising from the land remediation works also takes into account the availability of the additional 153 hectares of temporary access land described above and therefore the significance of the temporary, medium-term effect of the land remediation works on the Gelligaer and Merthyr urban common is assessed as **Minor Adverse**. This does not take into account the possibility of access being retained around remediation works and assumes that the whole area is fenced off, contrary to Miller Argent's intentions.
- 6.202 Following completion of the mining operations the site would be restored in accordance with the agreed restoration strategy, including the re-establishment of the rights of public access to the common land. Additional areas would be put forward for registration as common land and the

permanent long-term effect of the restoration of the land is therefore assessed as **Minor Beneficial**. The restoration of the CDP would result in approximately 23 hectares of land being brought back into the urban common, which would also result in a permanent long-term **Minor Beneficial** effect.

Public Rights of Way

- 6.203 The operational boundary would be fenced during the preliminary operations and the public rights of way affected would be stopped up. Within 24 months from the commencement of coaling new linear recreational routes would be put in place as part of the land remediation works described above. These together with areas of common land would provide north-south and east-west pedestrian and equestrian access around the site and the significance of temporary, long-term effect on the public rights of way network during the lifetime of the Nant Llesg Project is therefore assessed as **Minor Adverse**.
- 6.204 The land remediation works would require the stopping up of some public rights of way until the works have been completed. It is intended to retain access to areas of the common, subject to minor deviations to avoid works, but this is not included in the assessment. In addition, new permissive pedestrian and bridleway routes would be created within 2 years of the commencement of coaling, which would be legally created on permanent alignments during restoration and aftercare of the land. The significance of the permanent, long-term effect of the land remediation works on public rights of way is therefore assessed as **Minor Beneficial**. The restoration of the site would include the creation of public rights of way in accordance with the restoration strategy for the site and providing an improvement in the quantity and quality of the local network. This is assessed to have a permanent long-term effect of **Minor to Moderate Beneficial** significance.

Recreational Facilities

- 6.205 During the preliminary works for the Project the size of Rhaslas Pond would be reduced and the site fenced and therefore there would be no public access to this area for approximately 19 years, which is assessed to be of **Moderate Adverse** significance. There would be no direct effects on recreational facilities outside the site but there would be **Minor Beneficial** effects on some water-based recreational activities arising from the water management measures undertaken as part of the Project. Following the cessation of coaling the final void would be filled and, in accordance with the restoration strategy, Rhaslas Pond would be re-established and there would be long-term minor benefits to water quality. These are assessed to be of permanent, long-term **Negligible** significance.

Tourist Resources

- 6.206 No tourist resources are located within the Nant Llesg operational area and there would be no direct effects on those resources located outside the site. The Bent Iron, a well-known landmark, would be taken down and either stored or temporarily re-located. As part of the restoration strategy there would therefore be improved public access to existing recreational resources, the Rhymney Valley Ridgeway Walk would be created along a new public bridleway and ecological and cultural heritage enhancements would be put in place, and the Bent Iron would be reinstated on the edge of the urban common. The temporary and permanent effects on tourist resources during the operational mining phase and the restoration of the site of the Project is therefore assessed as **Negligible**.

Additional Mitigation and Residual Effects

- 6.207 No additional recreational or tourist mitigation measures have been put in place over and above those measures that have been included as part of the Project. The residual effects are therefore the same as those described above.

Cumulative Effects

- 6.208 The potential for cumulative effects has been assessed with the Ffos y Fran Land Reclamation Scheme, the Trecatti Landfill Site, the Cwmbargoed Disposal Point outside the Application Area and the Net Wood Pellet Facility. The assessment of cumulative effects on common land as a result of the Nant Llesg project, together with the FLRS and the Trecatti Landfill Site, takes into account the temporary suspension of access rights to a combined maximum area of nearly 487 hectares together with the provision of around 153 hectares of temporary access land to which there would be public access for the lifetime of the Project. The combined loss of the urban common would be temporary but over a long duration and is therefore assessed to be of **Minor/Moderate Adverse** significance. There would also be a temporary but long term cumulative effect of **Minor Adverse** significance on public rights of way.

Conclusions

- 6.209 Following the completion of the Nant Llesg project the site would be restored in accordance with the agreed restoration strategy resulting in beneficial effects on the recreational and tourist resources within and proximate to the site. The rights of public access to be urban common would be re-instated and two new areas put forward for registration as urban common. A new network of public rights of way would be created, including those new routes provided within the first 2 years of the project within the land remediation areas. In addition, there would be managed public access within the Bryn Caerau biodiversity compensation area. Rhaslas Pond would have restored access from the common and new public footpaths and the Bent Iron would be reinstated on the edge of the urban common.

References

- Caerphilly County Borough (November 2010) Local Development Plan (LDP)
- Highways Agency (2008) Design Manual for Roads and Bridges.
- Institute of Environmental Management and Assessment (2004) Guidelines for Environmental Impact Assessment.
- Welsh Government (2009) Minerals Technical Advice Note 2: Coal (MTAN2).
- Welsh Government (2012) Planning Policy Wales (5th Edition) (PPW).
- Welsh Government (2009) Technical Advice Note 16 Sport, Recreation and Open Space (TAN 16).
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- Welsh Office, *Circular 11/99 Environmental Impact Assessment* (1999)

Nant Llesg Surface Mine

Incorporating Land Remediation

Chapter 7

Traffic and Transport

Nant Llesg Surface Mine

Incorporating Land Remediation

Environmental Statement

Chapter 7 - Traffic and Transport

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7 Traffic and Transport

Chapter Overview

- 7.1 This chapter considers the traffic and transportation effects associated with the site enabling works, operation and restoration/aftercare phases of the proposed Nant Llesg Surface Mine, Incorporating Land Remediation (hereafter referred to as the “project”), including the capture of underlying coal.
- 7.2 The study area for traffic and transport has been defined as the public road network in the vicinity of the Nant Llesg site which will be used during its construction and operation. This includes the A465 and A4060 trunk roads and the unclassified Fochriw Road, Bogey Road and Rhymney Common Road which provide access to the development site from the trunk road network.
- 7.3 Annual Average Daily Traffic (AADT) flows have been obtained for sites on the local highway network using Automated Traffic Count (ATC) data collected during the year 2010, supplemented by a traffic count data undertaken at the Fochriw Road/South Tunnel Road junction in November 2011.
- 7.4 The data show that existing traffic flows on the local highway network are highest on the A465 Heads of the Valleys Road, although traffic flows are significantly lower than design capacities on all roads. This means that local roads could continue to operate satisfactorily even with substantial increases in traffic volumes.
- 7.5 Analysis of accident data indicates very few clusters of injury accidents on the local highway network and none can be considered statistically significant. It is clear that HGVs have not been instrumental in the cause of the accidents recorded, although it is also clear that a significant number of HGVs use the local highway network.
- 7.6 If the project was implemented, there would be an increase in traffic movements on the local highway network during the site enabling works and site operation phases in particular. The increases would be greatest on the route between the Nant Llesg site and Cwmbargoed Disposal Point (CDP), a distance of approximately 800m, as well as the main route to the trunk road network, i.e. via Fochriw Road and Rhymney Common Road. An increase in traffic flows of 48% on Bogey Road (from the CDP entrance to its junction with Fochriw Road – movements west of the CDP entrance will be restricted to LGVs and so will be of a lesser magnitude) and 27% on Fochriw Road (north of its junction with South Tunnel Road) is forecast as a result of the project. However, the impact of the project upon the operation of the rail network will be negligible, as it will remain well within capacity.
- 7.7 Proposed measures to mitigate the highway impacts are:
- a Site Environmental Management Plan (SEMP), to manage the impacts of HGV movements on the local highway network; and
 - improvements to the Bogey Road/Fochriw Road junction, to improve visibility for turning vehicles.
- 7.8 Assuming that the above mitigation measures are implemented, it is considered that the traffic and transport impacts of the project will be no worse than **minor adverse** temporary (long term) with respect to highway operation, highway safety and non-motorised users (i.e. pedestrians/cyclists).

The impact on non-motorised users is judged to be no worse than **minor adverse** temporary (long term) as the number of pedestrians and cyclists is low. The impact on physical fitness is judged to be no worse than **neutral** as there are very few people living adjacent to the site or the main HGV routes to it, and so very few people would be discouraged from walking or cycling as a result of the project. However, during the site restoration/aftercare phase, the potential creation of new pedestrian and cycle routes could deliver permanent **minor benefits** in respect of non-motorised users and physical fitness.

Introduction

7.9 This chapter considers the traffic and transportation effects associated with the site enabling works, operation and restoration/aftercare phases of the proposed Nant Llesg Surface Mine, Incorporating Land Remediation (hereafter referred to as the “project”), including the capture of underlying coal. It should be noted that Chapter 12: Air Quality and Chapter 13: Noise also consider the potential environmental effects from traffic and transport.

7.10 The traffic and transportation assessment has been undertaken by Mott MacDonald.

7.11 The chapter considers the traffic that will be generated during the site enabling works, operation and restoration/aftercare phases of the project and assesses the effects on, and measures to minimise disruption to, the local transport network.

7.12 The following guidance and policy advice has been used to inform the traffic and transport assessment:

- Highways Agency/Welsh Government (2008) The Design Manual for Roads and Bridges, Volume 11, Environmental Assessment;
- The Institute of Environmental Management and Assessment (IEMA) (2004) Guidelines for Environmental Impact Assessment;
- The Institute of Environmental Management and Assessment (IEMA) (2003) Guidelines for the Assessment of Road Traffic;
- Welsh Government (2007) Technical Advice Note (TAN) 18 (Transport);
- South East Wales Transport Alliance (2010) Regional Transport Plan;
- Welsh Government (2008) Welsh Transport Planning and Appraisal Guidance (WelTAG); and
- Welsh Government (2009) Minerals Technical Advice Note 2: Coal, Sections 196 – 200 and Appendix O.

Methodology

Overview

- 7.13 This assessment has been undertaken as a combination of desk-top study, field survey and consultation with statutory agencies in line with current good practice and policy advice.
- 7.14 Predicted volumes of vehicle movements generated by the site enabling works, operation and restoration phases have been compared with baseline traffic flows recorded on the existing road network, to identify if there are likely to be periods where the increase in general traffic (or specifically HGV traffic) will exceed standard thresholds. Possible effects arising as a result of the additional traffic have been identified and their significance assessed.
- 7.15 A formal Transport Assessment (TA) has not been carried out for this development as the development site access will not be located within 67m of a trunk road (consistent with current DMRB guidance) and the local highway network has low background traffic flows and substantial spare capacity. As agreed with Caerphilly County Borough Council (CCBC), this traffic and transport chapter forms the Transport Statement for the development.

Data Sources

- 7.16 Miller Argent has provided some information with regard to traffic generation during the various phases of the project, which has been refined using Mott MacDonald's professional judgement in order to derive traffic generation and distribution assumptions for the purposes of this assessment. In addition, the following data sources have been used:
- Automated Traffic Count (ATC) data collected during the year 2010 for the Brig y Cwm Energy from Waste Facility Environmental Statement (RPS, December 2010). These data provide Annual Average Daily Traffic (AADT) flows covering the local and strategic road network in the vicinity of the development site;
 - Classified turning count data for the Fochriw Road/South Tunnel Road junction, collected for the periods 1200 to 1500 on Saturday 12th November 2011 and 0600 to 1900 on Thursday 17th November 2011; and
 - Road traffic accident data supplied by Caerphilly County Borough Council (CCBC) and Merthyr Tydfil County Borough Council (MTCBC) for Bogey Road, Fochriw Road, South Tunnel Road, Rhymney Common Road, the A465 (between Dowlais Top and Rhymney Bridge) and the A4060 (between Mountain Hare Roundabout and Dowlais Top). Both datasets cover a three year period.

Consultation

- 7.17 A written scoping opinion was received from CCBC which requested a transportation assessment to principally cover the programme for coal extraction and its overlap with the Ffos-y-fran Land Reclamation Scheme (FLRS), defining the mode by which the coal would be removed from the site (i.e. rail or road).

- 7.18 Discussions were subsequently held with CCBC and the South Wales Trunk Road Agency (SWTRA) to identify the scope of this assessment and discuss relevant traffic issues during construction and operation of the development.
- 7.19 Neither statutory consultee requested a formal Transport Assessment at the scoping stage or during follow up telephone/email correspondence. It was noted by SWTRA that the estimated traffic generation for the project would be unlikely to have a noticeable impact on the operation of the trunk road network.

Extent of study area

7.20 The transport routes that are to be used locally by traffic generated by the project have been identified. These are:

- **Towards Merthyr Tydfil/Cardiff** – via Fochriw Road, Rhymney Common Road westwards to ASDA superstore roundabout, A465 Heads of the Valleys Road, A4060;
- **Towards Rhymney/Abergavenny** – via Fochriw Road, Rhymney Common Road eastwards to A465/A469/B4297 interchange, A465 Heads of the Valleys Road, A469 (to Rhymney);
- **Towards Bargoed** (for LGV traffic) – via Fochriw Road, Ogilvie Terrace, Bailey Street, New Road, Groes-faen Terrace, A469 Factory Road; and
- **Towards Merthyr Tydfil/Cardiff** (for LGV traffic) – via Bogey Road, A4060.

Assessing Impact Significance

Overview

- 7.21 Impact magnitude and significance are defined below. The general approach to assess the impact on traffic flows and congestion (these are regarded to be “safety” and “operational” issues) has been to determine impact magnitude by reference to percentage change in total flows. Significance has then been determined on the basis of a number of factors, including percentage changes in the number of HGVs.
- 7.22 The criteria for assessing the impact magnitude on non-motorised users (NMUs), journey ambience and physical fitness are also reviewed.

Impact magnitude

- 7.23 The comparison of baseline and development scenarios will enable the magnitude of the traffic flow changes on each of the routes within the study area to be established. The criteria for the determination of impact magnitude are given in Table 7.1 below.

Table 7.1: Impact magnitude

Magnitude	Highway Operation and Safety Impacts
Negligible	None
Slight	Up to +/- 5% flow change
Moderate	+/- 5 –10% flow change
Major	>10% flow change

Note: These criteria apply to changes in total flows.

- 7.24 The criteria levels for the highway operation and safety impact magnitudes have been obtained from Institution of Highways and Transportation (IHT) Guidelines for Traffic Impact Assessment and The Institute of Environmental Assessment Guidelines for the Assessment of Road Traffic.
- 7.25 These magnitude impacts are used as the basis for assessing the significance of the highway operation and safety impacts on each of the links within the study area.
- 7.26 The criteria for assessing the impact magnitude on Non Motorised Users and physical fitness are more subjective and require an element of professional judgement, although the guidance provided in the Welsh Transport Planning and Appraisal Guidance (WelTAG) has provided the basis for each of the assessments. It would be inappropriate to review these purely in terms of changes in traffic flows on the local network. Following the traffic flow analysis and the determination of the impact magnitude in terms of highway operation, a review of the study area will be undertaken to determine the impact magnitude in terms of Non Motorised Users and physical fitness.

Impact significance

- 7.27 The significance of impacts is to a degree, subjective and requires professional judgement. Determination of significance is therefore based on expert judgement taking into account a number of factors relating to the sensitivity of the receiving environment, as well as impact magnitude. In this context, sensitive receptors are land uses which would generate a high number of vulnerable road users (i.e. significant housing, schools or hospitals, designated pedestrian/cycle routes).
- 7.28 The significance of impacts has been categorised under headings derived from WelTAG, as presented within Table 7.2 below.

Table 7.2: Definitions of significance for traffic and transport

Significance	Definition
Major Beneficial	<ul style="list-style-type: none"> • In respect of operational impacts, elements of the highway network where congestion is relieved by the magnitude of impact predicted. • In respect of safety impacts, major reductions in total traffic flow on parts of the network with a poor accident record. • In respect of safety impacts, moderate or major change to total flows at locations and at times when there are a high number of vulnerable road users (cyclists, pedestrians, equestrians) at several locations on the route, or in the vicinity of hospitals or schools combined with a lack of footways or large sections of road with direct residential frontages. • In respect of safety impacts, HGV flows decreasing by more than 50% on routes with sensitive receptors (e.g. schools, hospitals) present. • In respect of NMUs, where moderate or major changes in traffic are apparent, where NMUs are present and where significant improvements to the pedestrian / cycle facilities are provided. • In respect of physical fitness, where a substantial number of people would experience significant health benefits.
Moderate Beneficial	<ul style="list-style-type: none"> • In respect of operational impacts, isolated parts of the highway network brought below operational capacity for periods of the day. • In respect of safety impacts, moderate total flow changes on parts of the network with a poor accident record. • In respect of safety impacts, moderate or major total flow changes in locations with some vulnerable road users, or that are near schools or hospitals, or have direct residential frontages. • In respect of safety impacts, HGV flows decrease by 25% to 50% on routes with sensitive receptors present. • In respect of NMUs, where moderate or major changes in traffic are apparent, where NMUs are present and where improvements to the pedestrian / cycle facilities are provided. • In respect of physical fitness, where a large number of people would experience health benefits.
Minor Beneficial	<ul style="list-style-type: none"> • In respect of operational impacts, the network operates within capacity and flow changes on the network are slight. • In respect of safety impacts, slight total flow changes on parts of the network with a poor accident record. • In respect of safety impacts, slight total flow changes in locations with some vulnerable road users, or that are near schools or hospitals, or have direct residential frontages.

Significance	Definition
	<ul style="list-style-type: none"> • In respect of NMUs, where slight changes in traffic are apparent, where NMUs are present and where improvements to the pedestrian / cycle facilities are provided. • In respect of physical fitness, where a group of people would experience health benefits.
Negligible Beneficial	<ul style="list-style-type: none"> • In respect of operational impacts, the network operates within capacity and flow changes on the network are negligible. • In respect of safety impacts, accident rates are at or below average. • In respect of safety impacts, low vulnerable road user activity, with no large settlements or sensitive receptors on route, or negligible total flow change. • In respect of safety impacts, HGV flows decrease by less than 25%, or no sensitive receptors present. • Criteria for higher significance classification not met.
Neutral	<ul style="list-style-type: none"> • No changes to traffic flows. • No changes to local infrastructure or services.
Negligible Adverse	<ul style="list-style-type: none"> • In respect of operational impacts, the network operates within capacity and flow changes on the network are negligible. • In respect of safety impacts, accident rates are at or below average. • In respect of safety impacts, low vulnerable road user activity, with no large settlements or sensitive receptors on route, or negligible total flow change. • In respect of safety impacts, HGV flows increase by less than 25%, or no sensitive receptors present. • Criteria for higher significance classification not met.
Minor Adverse	<ul style="list-style-type: none"> • In respect of operational impacts, the network operates within capacity and flow changes on the network are slight. • In respect of safety impacts, slight total flow changes on parts of the network with a poor accident record. • In respect of safety impacts, slight total flow changes in locations with some vulnerable road users, or that are near schools or hospitals, or have direct residential frontages.

Significance	Definition
	<ul style="list-style-type: none"> • In respect of NMUs, where slight changes in traffic are apparent, where NMUs are present and where improvements to the pedestrian / cycle facilities are not provided. • In respect of physical fitness, where a group of people could experience health problems.
Moderate Adverse	<ul style="list-style-type: none"> • In respect of operational impacts, isolated parts of the highway network taken over operational capacity for periods of the day. • In respect of safety impacts, moderate total flow changes on parts of the network with a poor accident record. • In respect of safety impacts, moderate or major total flow changes in locations with some vulnerable road users, or that are near schools or hospitals, or have direct residential frontages. • In respect of safety impacts, HGV flows increase by 25% to 50% on routes with sensitive receptors present. • In respect of NMUs, where moderate or major changes in traffic are apparent, where NMUs are present and where improvements to the pedestrian / cycle facilities are not provided. • In respect of physical fitness, where a large number of people could experience health problems.
Major Adverse	<ul style="list-style-type: none"> • In respect of operational impacts, elements of the highway network taken over operational capacity by the magnitude of impact predicted. • In respect of safety impacts, major changes in total traffic flow on parts of the network with a poor accident record. • In respect of safety impacts, moderate or major change to total flows at locations and at times when there are a high number of vulnerable road users (cyclists, pedestrians, equestrians) at several locations on the route, or in the vicinity of hospitals or schools combined with a lack of footways or large sections of road with direct residential frontages. • In respect of both safety impacts, HGV flows increasing by more than 50% on routes with sensitive receptors (e.g. schools, hospitals) present. • In respect of NMUs, where moderate or major changes in traffic are apparent, where NMUs are present and where pedestrian / cycle facilities are degraded. • In respect of physical fitness, where a substantial number of people would experience significant health problems.

- 7.29 The changes (as a consequence of the project) within the study area are assessed against the criteria set out in Table 7.2, and by reviewing the significance of each of the impacts it is ultimately possible to identify the overall impact of the proposal.
- 7.30 Assessment of the magnitude of impacts takes into account the impact duration, for which the following definitions are used:
- Temporary - Short Term: A period of months, up to one year;
 - Temporary - Medium Term: A period of more than one year, up to five years;
 - Temporary - Long Term: A period greater than five years but not beyond the lifetime of the project;
 - Permanent: A period beyond the lifetime of the project.

Limitations to methodology

- 7.31 When developing the methodology for the assessment presented within this chapter, a number of assumptions have been relied upon. These assumptions are listed below;
- Construction HGVs would conform to the lorry routeing agreement, if required by CCBC, to be defined within the Site Environmental Management Plan (SEMP). This will complement the 7.5 tonne weight limit already in operation on Bogey Road. It is proposed that the SEMP would be agreed with CCBC and implemented via planning condition 1;
 - The distribution of construction contractor LGVs on the local highway network would be the same as the distribution of permanent site staff and operatives at the Nant Llesg Project;
 - When operational the project would operate at maximum capacity on weekdays;
 - Sundays and bank holidays would see no working apart from water bowzers, security or emergency maintenance, requiring fewer operatives to be on the site at these times. Although the site would operate at maximum capacity on Saturday (during working hours), only 20% of office staff would be present; and

¹ It is acknowledged that Minerals Technical Advice Note 2 considers Traffic Regulation Orders (TROs) to be the appropriate means of controlling the right of passage over public roads (paragraph O5). However, the same paragraph also states that "the MPA would need to be sure that the limitations would not unacceptably affect other businesses or residents". In this instance, therefore, a routeing agreement with CCBC is considered the most appropriate means of routeing HGVs associated with Miller Argent and its subcontractors away from inappropriate roads and sensitive receptors. It would complement the existing TRO on the Bogey Road.

- As indicated by historic trends, background traffic growth within the study area would be in-line with national predictions.

Assessment of Cumulative Impacts

- 7.32 Cumulative impacts are those effects that may result from the combination of other coincident planned activities within the study area for assessing transport impacts. Whilst a single activity may itself result in an insignificant impact, it may, when combined with other impacts (significant or insignificant) in the study area and occurring at the same time, result in a cumulative impact that is significant.
- 7.33 The traffic and transport effects of other activities taking place in parallel with this project, i.e. FLRS, Cwmbargoed Disposal Point, Merthyr Industrial Services waste tipping operations and the Trecatti landfill site, are already included in the baseline traffic flows presented in Table 7.3 of this assessment.
- 7.34 During scoping discussions with CCBC it was noted that a planning application had been submitted to MTCBC for the construction of a wind farm at Bedlinog Farm, Bedlinog. Construction would take place over a six month period with abnormal loads being delivered over a three week period. These abnormal loads would comprise wind farm turbine components, transported from the strategic highway network via Rhymney Common Road and Fochriw Road. Other deliveries would be made via various routes. However, due to the temporary nature of the traffic generated during wind farm construction and the minimal impact of traffic generated during operation, it was agreed with CCBC that a cumulative impact assessment was not required to review the traffic impacts of the proposals .
- 7.35 Since these scoping discussions, permission has been granted for a Wood Pellet Facility located at Capital Valley Eco-Park, Rhymney. A cumulative impact assessment has been undertaken to review the potential traffic impact of this facility and the Nant Llesg Project.

Baseline Environment

Study Area

- 7.36 The study area for traffic and transport has been defined as the public road network in the vicinity of the Nant Llesg site which will be used during its construction and operation. This includes the A465 and A4060 trunk roads and the unclassified Fochriw Road, Bogey Road and Rhymney Common Road which provide access to the development site from the trunk road network. The extent of the study area is shown on Drawing MA/NL/ES/07/001.

Local Road Network

Fochriw Road

- 7.37 The unclassified Fochriw Road provides access to the development site (i.e. the proposed office, car park and workshop area) from its junction with Rhymney Common Road approximately 2.5km to the north of the site access (Point "A"). Between the workshop entrance and the Rhymney Common Road junction, Fochriw Road is a two-way single carriageway road typically 7.0m in width, which is able to accommodate HGV movements associated with Trecatti Landfill Site and Cwmbargoed Disposal Point. It also provides access to a single residential property at Halfway House.

- 7.38 From the existing Cwmbargoed Disposal Point site access to the residential settlement of Pentwyn 1.6km to the south, Fochriw Road narrows to approximately 5.7m in width. The speed limit is derestricted (i.e. 60mph) throughout.

Bogey Road

- 7.39 The unclassified Bogey Road connects Fochriw Road with the A4060 approximately 4.0km to the west, crossing the local authority boundary into Merthyr Tydfil. It is generally a single track road (typical width 3.8m) with passing places. It provides access to residential dwellings, a farm and a traveller's site. Bogey Road also provides the most direct route between the A4060 and Cwmbargoed Disposal Point, although part of its length is subject to a 7.5 tonne weight limit which prohibits through HGV movements.
- 7.40 At its western end, Bogey Road forms one arm of a four armed roundabout with the A4102 Goat Mill Road and the A4060 north and south. A footway is provided on the southern side of Bogey Road for a distance of 250m eastwards from the A4060 roundabout. No other pedestrian facilities are provided.
- 7.41 The speed limit is derestricted (i.e. 60mph) throughout but with an advisory speed limit of 30mph on steep sections. There is a signal controlled crossing at GR 308840, 206240 to facilitate the crossing of HGVs and heavy plant between Cwmbargoed Disposal Point and the Ffos-y-fran Land Reclamation Scheme. Lighting is provided in the vicinity of the crossing but Bogey Road is otherwise unlit.

Rhymney Common Road

- 7.42 Rhymney Common Road is an unclassified single carriageway road running from east to west, connecting with the A465 Heads of the Valleys Road at both ends. It is typically 6.0m in width.
- 7.43 There is a priority T-junction approximately 1.2km east of the ASDA superstore roundabout from which Fochriw Road extends southwards as the minor junction arm, providing HGV access to the existing Cwmbargoed Disposal Point, Ffos-y-Fran Land Reclamation Scheme and the Trecatti Landfill Site.

South Tunnel Road

- 7.44 South Tunnel Road is an unclassified single carriageway road linking Fochriw Road with Pontlottyn Road approximately 1.5km to the east. A derestricted (i.e. 60mph) speed limit is in operation, except on the approach to the Pontlottyn Road priority T-junction from where a 30mph limit applies. The road is typically 4.2m wide with passing places on narrow sections.

Pontlottyn Road

- 7.45 The unclassified Pontlottyn Road links the villages of Fochriw and Pontlottyn and also provides access to the A469 Rhymney to Cardiff road. Between Fochriw and Pontlottyn street lighting is provided and a 30mph speed limit applies throughout. Pontlottyn Road is single carriageway with a typical width of 6.0m although within Pontlottyn village a number of kerb build outs have been installed to calm traffic. There are a number of residential frontages as well as a primary school.

A465 Heads of the Valleys Road

- 7.46 The A465 is a trunk road managed by SWTRA which links Swansea and the M4 to the west with Abergavenny and Hereford to the east. It connects with Dowlais Top and the

A4060 via a dumbbell roundabout. To the east of the roundabout, the A465 is a dual carriageway with an approximate road width of 7.5m. To the west of the roundabout, the A465 is a single carriageway road with two westbound lanes and one eastbound lane with a total width of approximately 10.0m. A derestricted speed limit applies (i.e. 60mph single carriageway/70mph dual carriageway).

A4060

7.47 The A4060 is also a trunk road managed by SWTRA. It is a dual carriageway which forms the eastern boundary of Merthyr Tydfil and provides a strategic route between the A465/Dowlais Top to the north and the A470 to the south. Within the built up area of Pentrebach a 40mph speed limit applies but northwards of the A4060/Triangle Business Park roundabout a derestricted (i.e. 70mph) speed limit is in operation.

Existing Traffic Flows

7.48 Annual Average Daily Traffic (AADT) flows have been obtained for sites on the local highway network using Automated Traffic Count (ATC) data collected during the year 2010 for the Brig y Cwm Energy from Waste Facility Environmental Statement (RPS, December 2010). The 2010 flows do incorporate traffic associated with the operation of FLRS, as works commenced in 2007. Use of the 2010 flows to calculate the baseline was agreed during scoping discussions with CCBC. The 2010 baseline flows do not, however, include coal exports by HGV, which commenced in May 2012 and consist of a maximum of 20 two-way HGV movements per day.

7.49 These flows were supplemented by classified turning count data for the Fochriw Road/South Tunnel Road junction collected in November 2011. The latter dataset has been factored to AADT data using national data from the Design Manual for Roads and Bridges (DMRB), Volume 13 Section 1 Part 4. This manual contains factors to convert 12 hour (0700-1900) weekday average traffic flows to 24 hour flows.

7.50 All figures are expressed as two-way AADT flows, which refer to the sum of journeys in both directions.

7.51 The proportion of AADT flow that is due to HGVs was also derived from the traffic data. The recorded 2010 and factored 2011 AADT (7-day) flows for the roads within the study area are presented in Table 7.3 and illustrated geographically within Drawing MA/NL/ES/07/002.

Table 7.3 Baseline traffic flows

Road	Year	Location	AADT	HGV %
Bogey Road	2010	West of junction with Fochriw Road	967	4.3%
Fochriw Road	2010	South of junction with Bogey Road	2193	2.8%
Fochriw Road	2011	North of junction with South Tunnel Road	2447	10.0%

Road	Year	Location	AADT	HGV %
Fochriw Road	2011	Between junction with South Tunnel Road and junction with Bogey Road	2451	9.1%
South Tunnel Road	2011	East of junction with Fochriw Road	1227	4.1%
Fochriw Road	2010	North of junction with unclassified road linking to Pontlloftyn Road (through Fochriw village)	2159	3.4%
Fochriw Road	2010	South of junction with Rhymney Common Road	2304	3.1%
Rhymney Common Road	2010	West of junction with Fochriw Road	3864	1.7%
Rhymney Common Road	2010	East of junction with Fochriw Road	2185	1.6%
Rhymney Common Road	2010	East of ASDA Roundabout	3943	3.4%
Road north of Dowlais Top Roundabout	2010	South of ASDA Roundabout	11185	2.3%
A465 Heads of the Valleys Road	2010	West of A4060 Roundabout	16147	7.5%
A465 Heads of the Valleys Road	2010	East of A4060 Roundabout	22714	7.7%
A4060	2010	South of A465 Roundabout	11949	7.3%
Rhymney Common Road	2010	North of A465/A469 Dumbbell Roundabout	2193	1.6%
A465 Heads of the Valleys Road	2010	Eastbound entry slip road (A469)	1773	4.1%
A469	2010	Between A465/A469 Dumbbell Roundabouts	5981	2.8%

Road	Year	Location	AADT	HGV %
A465 Heads of the Valleys Road	2010	Eastbound exit slip road (A469)	2738	2.7%
A465 Heads of the Valleys Road	2010	Westbound exit slip road (A469)	1909	1.8%
A465 Heads of the Valleys Road	2010	Westbound entry slip (A469)	2924	1.7%
B4257	2010	East of A465/A469 Dumbbell Roundabouts	2850	1.5%
A469	2010	South of A465/A469 Dumbbell Roundabouts	7656	2.3%

7.52 The traffic count data show that flows on the local road network are highest on the A465 Heads of the Valleys Road, although traffic flows are significantly lower than the design capacities of 13,000 AADT on 7.3m wide single carriageway roads and 39,000 AADT on dual 2 lane all purpose carriageways, as set out in DMRB Volume 5 Section 1 Part 3 TA46/97 Table 2.1.

Road Traffic Accidents

7.53 Personal Injury Accident (PIA) data has been obtained for the most recently available three year period on the surrounding road network, as agreed with CCBC. The full data is included as MA/NL/ES/A07/001.

Roads within Caerphilly County Borough Council boundary

7.54 Capita Symonds has provided PIA data for the period 01/09/2008 to 31/08/2011. The study area includes the following roads:

- part of Bogey Road (for a distance of 500m westwards from its junction with Fochriw Road);
- Fochriw Road (from Pentwyn to Rhymney Common Road);
- Rhymney Common Road (from the county boundary eastwards to the A465 “dumbbell” roundabout);
- South Tunnel Road; and
- A465 (from the county boundary eastwards to the A4048 roundabout at Duke’s Meadow).

- 7.55 A total of 22 accidents were recorded on the above roads during the three year period, of which three resulted in serious injury and the remaining 19 resulted in slight injury. No fatal injury accidents were recorded.
- 7.56 Of the 19 slight injury accidents, two involved light goods vehicles, two involved pedestrians and one involved a bus. The remainder involved only cars.
- 7.57 On Fochriw Road, three injury accidents were recorded in the vicinity of its junction with Bogey Road. Of these, one was of serious severity and the others slight, as summarised below:
- the serious injury accident occurred as a result of a southbound car which skidded and rolled down the banking in wet weather. No other vehicles were involved;
 - a slight injury accident occurred when a northbound car went to overtake a vehicle on the approach to a brow in the road and collided with an oncoming car; and
 - a second slight injury accident took place when a vehicle turned right into Bogey Road, colliding with the offside of a car travelling north towards Dowlais.
- 7.58 Further north along Fochriw Road, three slight injury accidents were recorded between its junction with South Tunnel Road and its junction with Rhymney Common Road. One of these involved a car braking sharply to avoid a stone in the carriageway, causing the passenger to sustain neck pain. Another resulted from a car swerving to avoid a sheep in the carriageway during the hours of darkness, which collided with an oncoming car. The third accident also occurred during darkness hours, involving a car travelling south which overtook stationary vehicles waiting to turn right into the Trecatti Landfill Site and colliding with an oncoming car as a result.

Roads within Merthyr Tydfil County Borough Council boundary

- 7.59 The local authority has provided PIA data for the period 01/01/2008 to 31/12/2010. The study area includes the following roads:
- Bogey Road (from the A4060/A4102 roundabout to a point 500m west of its junction with Common Road);
 - A4060 (from Mountain Hare to Dowlais Top); and
 - A465 (from Pant Road eastwards to the county boundary); and
 - Rhymney Road (from Dowlais Top eastwards to the county boundary).
- 7.60 A total of 27 injury accidents were recorded on the above roads during the three year period. Of these, one resulted in fatal injury, three resulted in serious injury and the remaining 23 resulted in slight injury.
- 7.61 The fatal injury accident occurred on the A465, 250m west of the Dowlais Top roundabout, where a car collided with a crossing pedestrian in darkness.
- 7.62 Of the three serious injury accidents, two occurred to the west of Dowlais Top roundabout. One of these was the result of a car performing an unlawful U-turn 500m to the west of the roundabout which caused a collision with two other cars. The other occurred 300m to the west of the roundabout as a result of a car driver clipping the nearside kerb and leaving the carriageway. The third serious injury accident occurred on the A4060, 250m north of the A4102/Bogey Road roundabout, as a result of a car driver leaving the carriageway.

- 7.63 Closer to the development site, one slight injury accident was recorded on Bogey Road as a result of a car driving at speed during the hours of darkness in wet weather directly towards a second car, which was forced to take evasive action and entered a ditch.
- 7.64 A cluster of four injury accidents has been identified on the eastbound A465 approach to Dowlais Top roundabout, three of these being rear end shunts and the other involving a loss of control under heavy braking. A fifth accident occurred in the same area, but involved a car travelling westbound which lost control in wet weather. No other clusters of injury accidents were identified from the MTCBC data during the three year period.

Summary

- 7.65 Few clusters of injury accidents have been identified in either of the three-year data sets analysed, and none involving more than four accidents.
- 7.66 Three accidents were recorded in the vicinity of the Fochriw Road/Bogey Road junction, and although these do not represent a statistically significant cluster (as the number of recorded accidents is too small and the causation of each is different), the restricted visibility to the south of this junction may make this section of Fochriw Road sensitive in road safety terms.
- 7.67 It is clear from the data that HGVs have not been instrumental in the cause of the accidents recorded.

Planned Changes to the Road Network

- 7.68 Works on Section III of the A465 Heads of the Valleys Road Dualling Scheme commenced in January 2013, covering the section between Dukestown and Brynmawr, although SWTRA has advised that 60% of the construction works will be away from the current road alignment. Section II (Brynmawr to Gilwern) is programmed for 2014. Closer to the project site, the dualling of the A465 west of Dowlais Top does not yet have a programme date although completion by 2020 is anticipated.
- 7.69 There are no programmed maintenance works on the A465 which are anticipated to cause significant disruption to, or the diversion of, traffic generated by the project. SWTRA advise that most cyclic maintenance works involve standard lane closures during the daytime, with minimal disruption. Full carriageway closures are infrequent and would usually occur overnight.

Pedestrian and Cycle Access

- 7.70 A pedestrian footway is provided on the southern side of Bogey Road for a length of approximately 250m eastwards from the A4060 roundabout. No other dedicated pedestrian facilities are provided.
- 7.71 Gelligaer and Merthyr Urban Common is an area of open access land, although there are way-marked public rights of way which cross Common Road and the road linking Common Road with Pontlottyn Road to the north of Fochriw village.

- 7.72 National Cycle Network (NCN) Route 46 (Merthyr Tydfil to Brynmawr) provides a signed cycle route from Rhymney Common Road, east of its junction with Fochriw Road, to Dukestown, Tredegar via a combination of off-road links and minor roads. NCN 469 provides a signed off-road cycle route between Bargoed and Parc Cwm Darran, south of Pentwyn.

Public Transport Access

- 7.73 There is very limited public transport provision in the vicinity of the Nant Llesg scheme. The closest bus stops to the site are on Pontlottyn Road in the village of Fochriw, approximately 2.0km to the east of the proposed site access. Service 1 provides 13 buses per weekday between Merthyr Tydfil and Bargoed, and Service 4 provides five buses per weekday between Tredegar and Bargoed.
- 7.74 The nearest railway station is at Pontlottyn, approximately 3.5km to the east of the proposed site access. Pontlottyn is served by hourly Rhymney Valley services from Penarth via Cardiff to Rhymney, one stop to the north of Pontlottyn. Merthyr Tydfil railway station, approximately 5.0km to the west of the site, is the terminus for half-hourly rail services from Bridgend and Barry Island, both routes via Cardiff.
- 7.75 The distance from the nearest bus stops/rail stations to the site means that it is unlikely that public transport services will be used by either Miller Argent personnel or sub-contractors.
- 7.76 A freight-only rail line diverges from the Rhymney Valley line at Ystrad Mynach, which provides access to Cwmbargoed Disposal Point (CDP) via Bedlinog. Rail sidings at CDP are currently used for the despatch of coal extracted from FLRS primarily to Aberthaw Power Station with lesser dispatches going to TATA Steel Works, Port Talbot and other destinations. Of the 36 rail paths per week available for this purpose (no trains are despatched on Sundays and this would be unlikely to change), 14 are currently used on average.

Baseline scenario

- 7.77 If the development proposals were not to be implemented, it has been assumed that background traffic flows on the local highway network would increase broadly in line with the National Transport Model (NTM), adjusted to local circumstances using TEMPRO 6.2 local growth factors (car driver, average day) for Rhymney and Merthyr Tydfil.
- 7.78 TEMPRO/NTM growth factors have been used to forecast traffic flows for baseline years of 2014 (site enabling works), 2015 (site operation) and 2029 (site aftercare). The resulting growth factors (for minor, principal and trunk roads) are presented in Table 7.4.

Table 7.4: TEMPRO/NTM (Version 6.2) traffic growth factors

Years	Rhymney			Merthyr Tydfil		
	00PK10 - Minor	00PK10 - Principal	00PK10 - Trunk	00PH1 - Minor	00PH1 - Principal	00PH1 – Trunk
2010-2011	1.0039	1.0031	1.0023	1.0162	1.0154	1.0146
2010-2014	1.0206	1.0175	1.0143	1.0337	1.0305	1.0273
2011-2014	1.0167	1.0143	1.012	1.0171	1.0148	1.0124
2010-2015	1.0263	1.0224	1.0184	1.0394	1.0355	1.0314
2011-2015	1.0222	1.0191	1.016	1.0228	1.0197	1.0165
2010-2029	1.233	1.242	1.2431	1.2373	1.2463	1.2475
2011-2029	1.2282	1.2381	1.2402	1.2175	1.2273	1.2294

7.79 The resulting 2014, 2015 and 2029 baseline flows are shown in Tables 1.5, 1.7 and 1.10 respectively and illustrated geographically within Drawings MA/NL/ES/07/003, MA/NL/ES/07/005 and MA/NL/ES/07/007 respectively.

Impact Assessment

Overview

7.80 Estimates of traffic generation during the site enabling works, operational and restoration phases were developed based on a work programme and assumed staffing levels provided by Miller Argent.

7.81 Impacts during these phases have been identified in terms of the effect of development traffic on road capacity and safety. The environmental impacts associated with transport, specifically air quality and noise, are addressed in Chapters 12 and 13 respectively.

Assessment of Impacts during Site Enabling Works

Description of Impacts

7.82 It is anticipated that most works will take place during 2014. These works will include:

- archaeological excavations;

- preliminary soil stripping;
- construction of soil mounds/baffle embankments;
- the removal of a small volume of waste off-site, from the former railway cutting currently used by Merthyr Industrial Services (MIS), with MIS operations scheduled to cease during 2014;
- construction of coal stocking and barrel wash areas on the northern section of Rhaslas Pond;
- construction of the office, car park, workshops and internal roads;
- construction of the site access road, connecting with Fochriw Road via a priority T-junction approximately 130m north of its junction with South Tunnel Road (Drawing MA/NL/ES/07/001);
- carriageway re-profiling on Fochriw Road, to the south of its junction with Bogey Road, together with resurfacing on the other junction approaches and the installation of directional and junction warning signs;
- the erection of vehicle washing and weighbridge facilities;
- the remediation of land owned by CCBC.

7.83 Working hours will be 0700 to 1900 on weekdays and 0700 to 1400 on Saturdays. No HGV movements will be generated outside of these times, although a small number of operatives (no more than 15 at any one time) will be present on Sundays to operate pumps, maintain plant and provide site security.

7.84 Other general traffic movements will take place during the site enabling works. Fuel deliveries will be required, at a rate of approximately two per week for construction plant (months 1 to 6) and then approximately six per week thereafter as overburden and coal extraction is commissioned.

7.85 All HGVs associated with site enabling works will be prohibited from using Bogey Road west of CDP (in accordance with the recently introduced 7.5 tonne weight limit). The specific HGV access routes will vary depending on journey origin, however the anticipated routes are:

- Plant mobilisation/demobilisation – from the Cardiff area via the A470, A4060, Rhymney Common Road and Fochriw Road;
- Fuel deliveries – from the Cardiff area via the A470, A4060, Rhymney Common Road and Fochriw Road;
- Removal of wastes – non-hazardous waste via Fochriw Road to the Trecatti waste disposal site (alternatively waste may be transported to sites in Ebbw Vale or Brynmawr) and hazardous waste via Fochriw Road, Rhymney Common Road and the A4060 southwards to the M4 and then eastwards to Swindon;
- Other deliveries – 90% from Fochriw Road to the north of the site (45% from the Cardiff/Merthyr area via Dowlais Top roundabout and Rhymney Common Road, 45% from the Rhymney area and eastwards via the A465/A469 dumbbell

roundabouts and Rhymney Common Road), 10% from Fochriw Road to the south of the site (i.e. from the Bargoed area via Ogilvie Terrace).

- 7.86 A small number of HGV movements associated with coal exports from CDP will be made via a short length of Bogey Road from its junction with Fochriw Road. These movements,, which commenced in May 2012, will continue at their current levels. As these movements did not take place when the 2010/2011 baseline traffic data (presented in Table 7.3) was collected, they have been included in the assessment of site enabling works but do not form part of the Nant Llesg Project (since these movements are already accounted for in the traffic generated by the FLRS). These coal exports generate a maximum of 40 one-way HGV movements per day. Although these movements actually form part of the baseline, for the purposes of testing a worst case scenario, these have been included in the development flows. Additionally, the number of daily movements associated with coal exports is typically half of this number. These coal export HGV movements access the strategic highway network via Fochriw Road and Rhymney Common Road, with approximately 50% travelling west via Dowlais Top Roundabout and 50% east via the A465/A469 dumbbell roundabout.
- 7.87 It is estimated that a total of 89 plant deliveries will be made to site during months 1 to 6 (January to June 2014), comprising excavators, graders and dump trucks. Of these, 30 deliveries will require an abnormal load escort.
- 7.88 During months 1 to 6 a maximum of 118 personnel are expected to be employed (25 Miller Argent employees and 93 sub-contractors) although it should be noted that these numbers are maximum, and the average could be below this. After this period Miller Argent operatives (e.g. excavator and dump truck drivers) will commence employment, leading to a peak of 290 personnel between July and September 2014.
- 7.89 All personnel will live in offsite accommodation and will be transported to and from site by LGV (i.e. car, minibus or van). It is not intended that site personnel LGVs will be restricted to specific site access routes. However, based on the personnel trip distribution previously identified for FLRS, together with professional judgement, it is assumed for assessment purposes that LGVs will be distributed between the following routes:
- 42% to site via Bogey Road (12% Goat Mill Road, 30% A4060 (S));
 - 36% to site via Fochriw Road (N) (14% Rhymney Common Road (W), 22% Rhymney Common Road (E));
 - 11% to site via South Tunnel Road; and
 - 11% to site via Fochriw Road (S) and Ogilvie Terrace.
- 7.90 Occupancy of two persons per vehicle has been assumed for sub-contractors (this is considered realistic as it is likely that most will car share with one or more colleagues) with the exception of machine erection staff and consultants, who are assumed to drive to site alone. All Miller Argent staff and operatives are assumed to drive to site alone. This is considered a robust estimate as it is anticipated that some employees will car share.
- 7.91 The estimated traffic flow impact on local roads during site enabling works (using the month when average development flows are at their peak) is shown in Table 7.5 and illustrated geographically within Drawing MA/NL/ES/07/006. It should be noted that the AADT flows presented in the table include private cars, LGVs (i.e. goods vehicles up to 3.5 tonnes gross vehicle weight) and HGVs (i.e. goods vehicles over 3.5 tonnes gross vehicle weight).

Table 7.5: Traffic flow impact during site enabling works (total numbers)

Road	Route description	2014 Baseline			2014 during site enabling works		
		AADT	HGVs	HGV %	AADT	HGVs	HGV %
Bogey Road	West of junction with Fochriw Road	987	43	4.3%	1180	83	7.0%
Fochriw Road	South of junction with Bogey Road	2238	63	2.8%	2278	65	2.9%
Fochriw Road	North of junction with South Tunnel Road	2488	248	10.0%	2899	315	10.8%
Fochriw Road	Between junction with South Tunnel Road and junction with Bogey Road	2492	227	9.1%	2725	269	9.9%
South Tunnel Road	East of junction with Fochriw Road	1247	51	4.1%	1287	51	4.0%
Fochriw Road	North of junction with unclassified road linking to Pontlottyn Road (through Fochriw village)	2203	75	3.4%	2243	76	3.4%
Fochriw Road	South of junction with Rhymney Common Road	2351	73	3.1%	2530	138	5.5%
Rhymney Common Road	West of junction with Fochriw Road	3944	66	1.7%	4018	98	2.4%
Rhymney Common Road	East of junction with Fochriw Road	2230	37	1.6%	2334	69	3.0%
Rhymney Common Road	East of ASDA Roundabout	4076	140	3.4%	4150	172	4.1%
Road north of Dowlais Top Roundabout	South of ASDA Roundabout	11526	260	2.3%	11601	292	2.5%
A465 Heads of the Valleys Road	West of A4060 Roundabout	16588	1243	7.5%	16649	1257	7.6%

Road	Route description	2014 Baseline			2014 during site enabling works		
		AADT	HGVs	HGV %	AADT	HGVs	HGV %
A465 Heads of the Valleys Road	East of A4060 Roundabout	23334	1795	7.7%	23334	1795	7.7%
A4060	South of A465 Roundabout	12275	902	7.3%	12294	920	7.5%
Rhymney Common Road	North of A465/A469 Dumbbell Roundabout	2238	37	1.6%	2342	69	3.0%
A465 Heads of the Valleys Road	Eastbound entry slip road (A469)	1798	73	4.1%	1839	88	4.8%
A469	Between A465/A469 Dumbbell Roundabouts	6086	173	2.8%	6149	190	3.1%
A465 Heads of the Valleys Road	Eastbound exit slip road (A469)	2777	76	2.7%	2777	76	2.7%
A465 Heads of the Valleys Road	Westbound exit slip road (A469)	1936	36	1.8%	1977	51	2.6%
A465 Heads of the Valleys Road	Westbound entry slip (A469)	2966	51	1.7%	2966	51	1.7%
B4257	East of A465/A469 Dumbbell Roundabouts	2900	45	1.5%	2911	46	1.6%
A469	South of A465/A469 Dumbbell Roundabouts	7790	179	2.3%	7801	180	2.3%

7.92 Table 7.6 demonstrates the impact of the project during site enabling works in terms of percentage changes to the total traffic flows and HGV movement

Table 7.6: Traffic flow impact during site enabling works (percentage)

Road	Route description	Change in 2014 weekday flows due to scheme			
		Total change	Total % change	HGV change	HGV % change
Bogey Road	West of junction with Fochriw Road	193	20%	40	93%
Fochriw Road	South of junction with Bogey Road	40	2%	2	3%
Fochriw Road	North of junction with South Tunnel Road	411	17%	67	27%
Fochriw Road	Between junction with South Tunnel Road and junction with Bogey Road	233	9%	42	18%
South Tunnel Road	East of junction with Fochriw Road	40	3%	0	0%
Fochriw Road	North of junction with unclassified road linking to Pontlloyn Road (through Fochriw village)	40	2%	2	3%
Fochriw Road	South of junction with Rhymney Common Road	178	8%	65	88%
Rhymney Common Road	West of junction with Fochriw Road	74	2%	32	48%
Rhymney Common Road	East of junction with Fochriw Road	104	5%	33	89%
Rhymney Common Road	East of ASDA Roundabout	74	2%	32	23%
Road north of Dowlais Top Roundabout	South of ASDA Roundabout	74	1%	32	12%

Road	Route description	Change in 2014 weekday flows due to scheme			
		Total change	Total % change	HGV change	HGV % change
A465 Heads of the Valleys Road	West of A4060 Roundabout	61	0%	14	1%
A465 Heads of the Valleys Road	East of A4060 Roundabout	0	0%	0	0%
A4060	South of A465 Roundabout	19	0%	18	2%
Rhymney Common Road	North of A465/A469 Dumbbell Roundabout	104	5%	33	89%
A465 Heads of the Valleys Road	Eastbound entry slip road (A469)	41	2%	15	21%
A469	Between A465/A469 Dumbbell Roundabouts	63	1%	17	10%
A465 Heads of the Valleys Road	Eastbound exit slip road (A469)	0	0%	0	0%
A465 Heads of the Valleys Road	Westbound exit slip road (A469)	41	2%	15	43%
A465 Heads of the Valleys Road	Westbound entry slip (A469)	0	0%	0	0%
B4257	East of A465/A469 Dumbbell Roundabouts	11	0%	1	2%
A469	South of A465/A469 Dumbbell Roundabouts	11	0%	1	1%

7.93 Tables 7.5 and 7.6 show that there would be changes to the traffic flows on some of the links within the study area, with the changes particularly pronounced on the routes leading to and from the main site access, i.e. Fochriw Road and Rhymney Common Road.

Significance of Impacts

7.94 The significance of impacts during the site enabling works with respect to transport can be summarised as follows:

- in respect of safety, although the magnitude of traffic flow changes is major (i.e. 10% or greater) on some road links, the only sensitive receptors along these are a small number of residential dwellings on Fochriw Road and Bogey Road, none of which have a direct frontage onto the highway. The impact on the Bogey Road receptors will be limited to car and LGV movements only. It is therefore considered that there will be a **minor adverse** temporary (medium term) impact;
- in respect of highway operation, the network operates well within capacity and has a low sensitivity to traffic flow changes (as described in paragraphs 1.36 to 1.40, Fochriw Road and Bogey Road are both single carriageway roads, have adequate geometries and a low number of junctions and private access points), therefore changes in traffic flows will have a negligible impact on the operation of local roads. A **negligible adverse** temporary (medium term) impact is therefore anticipated;
- in respect of non-motorised users, major changes in traffic flow on Rhymney Common Road could affect users of National Cycle Network route 46, although the number of pedestrians and cyclists is low. A **minor adverse** temporary (medium term) impact is therefore anticipated; and
- in respect of physical fitness, due to the very small number of residential dwellings it is considered that the project will have a **neutral** impact. It is unlikely that the project would lead to a significant change in physical activity (i.e. walking or cycling) by a substantial number of people.

Assessment of Operational Impacts

Description of Impacts

7.95 It is anticipated that the extraction of coal from Nant Llesg will commence in 2015 and continue until 2024. Site access for cars and service vehicles will be taken via a new priority T-junction on Fochriw Road, approximately 130m north of the existing junction with South Tunnel Road.

7.96 HGV movements associated with the export of coal by road (restricted to 50,000 tonnes per annum from CDP) will continue. In addition to these movements, extracted coal (a maximum of 750,000 tonnes per annum) will be transported by HGV (payload 20 tonnes assumed) for processing at the CDP via the existing highway network, i.e. via the site access and entering Fochriw Road at Access Point 'A', and entering CDP via the existing HGV entrance from Bogey Road at Access Point 'B'. HGVs will return from the CDP to the coal extraction area via a separate exit onto Bogey Road approximately 150m further west at Access Point 'C'. This will maximise highway visibility for exiting HGVs and for oncoming vehicles. The location of the access points is shown on Drawing MA/NL/PA/003.

7.97 The remaining coal exports (a maximum of 700,000 tonnes per annum) will be despatched by rail using the currently allocated, but not used, train paths. Assuming a payload of

1,450 tonnes per train, this will result in a total of approximately 10 two-way train movements per week. These are in addition to the 14 two-way train movements currently made per week in association with the maximum of 1,000,000 tonnes per annum which is currently exported from the FLRS. Between both sites, a total of 24 train paths will be used on average per week, compared with the 36 train paths which are available.

- 7.98 The above assumes that a maximum of 1,750,000 tonnes of coal is processed at CDP during any one year (50,000 tonnes despatched by road and the remainder by rail). However, during the period when both sites are working simultaneously, the average annual tonnage will be approximately 1,500,000 tonnes. The average number of train paths used per week is therefore likely to be lower than the 24 paths stated, which represents a worst case. The Nant Llesg Project will therefore have a negligible impact on the operation of the rail network as it will remain well within capacity. The only potential impacts assessed with respect to rail transport are therefore air quality and noise and the results of these assessments are presented in chapters 12 and 13 respectively.
- 7.99 A maximum of 290 personnel will be employed during the operational phase, i.e. from early 2015 when coal extraction will overlap with archaeological excavations, the removal of waste off-site and lagoon works (employing a total of 28 sub-contractor personnel) to 2024. From the middle of 2015 onwards, a maximum of 271 Miller Argent personnel will be employed at the site. These staffing numbers represent absolute maximums based on a two shift working pattern, to be adopted if the Working Time Directive is implemented. This represents a worst case traffic generation scenario. If existing working time legislation remains in effect, a single shift working pattern will be adopted with reduced traffic generation. The assessment is therefore worst case scenario.
- 7.100 Working hours will vary by position, with office staff working 0800 to 1700 Monday to Friday and 0800 to 1400 on Saturdays, but operatives will work on a rotating shift pattern. Normal site operating hours will be 0700 to 1900 from Monday to Friday and 0700 to 1400 on Saturdays, but pumps and security operatives will be on site 24 hours per day, seven days per week (three shifts per day). All Miller Argent staff and operatives are assumed to drive to site alone, for the purposes of a robust assessment.
- 7.101 The estimated traffic flow impact on local roads during site operation (assuming the peak monthly average development flow for each road, which occurs in 2015 due to the overlap with some site enabling works) is shown in Table 7.7 and illustrated geographically within Drawing MA/NL/ES/07/006.

Table 7.7: Traffic flow impact during site operation (total numbers)

Road	Route description	2015 Baseline			2015 during site operation		
		AADT	HGVs	HGV %	AADT	HGVs	HGV %
Bogey Road	West of junction with Fochriw Road	992	43	4.3%	1467	367	25.0%
Fochriw Road	South of junction with Bogey Road	2251	64	2.8%	2290	64	2.8%
Fochriw Road	North of junction with South Tunnel Road	2502	249	10.0%	3188	576	18.1%
Fochriw Road	Between junction with South Tunnel Road and junction with Bogey Road	2505	229	9.1%	3020	553	18.3%
South Tunnel Road	East of junction with Fochriw Road	1254	52	4.1%	1293	52	4.0%
Fochriw Road	North of junction with unclassified road linking to Pontlottyn Road (through Fochriw village)	2216	75	3.4%	2255	75	3.3%
Fochriw Road	South of junction with Rhymney Common Road	2365	74	3.1%	2537	117	4.6%
Rhymney Common Road	West of junction with Fochriw Road	3966	67	1.7%	4039	90	2.2%
Rhymney Common Road	East of junction with Fochriw Road	2242	37	1.6%	2341	57	2.4%
Rhymney Common Road	East of ASDA Roundabout	4098	140	3.4%	4172	163	3.9%
Road north of Dowlais Top Roundabout	South of ASDA Roundabout	11582	261	2.3%	11655	284	2.4%
A465 Heads of the Valleys Road	West of A4060 Roundabout	16654	1248	7.5%	16714	1258	7.5%

Road	Route description	2015 Baseline			2015 during site operation		
		AADT	HGVs	HGV %	AADT	HGVs	HGV %
A465 Heads of the Valleys Road	East of A4060 Roundabout	23427	1802	7.7%	23427	1802	7.7%
A4060	South of A465 Roundabout	12324	906	7.3%	12337	919	7.4%
Rhymney Common Road	North of A465/A469 Dumbbell Roundabout	2251	37	1.6%	2350	57	2.4%
A465 Heads of the Valleys Road	Eastbound entry slip road (A469)	1806	73	4.1%	1844	83	4.5%
A469	Between A465/A469 Dumbbell Roundabouts	6115	174	2.8%	6175	184	3.0%
A465 Heads of the Valleys Road	Eastbound exit slip road (A469)	2788	76	2.7%	2788	76	2.7%
A465 Heads of the Valleys Road	Westbound exit slip road (A469)	1944	36	1.8%	1983	46	2.3%
A465 Heads of the Valleys Road	Westbound entry slip (A469)	2978	51	1.7%	2978	51	1.7%
B4257	East of A465/A469 Dumbbell Roundabouts	2914	45	1.5%	2925	45	1.5%
A469	South of A465/A469 Dumbbell Roundabouts	7827	180	2.3%	7838	180	2.3%

7.102 Table 7.8 demonstrates the impact of the project during operation in terms of percentage changes to the total traffic flows and HGV movements.

Table 7.8: Traffic flow impact during site operation (percentage)

Road	Route description	Change in 2015 weekday flows due to scheme			
		Total change	Total % change	HGV change	HGV % change
Bogey Road	West of junction with Fochriw Road	475	48%	324	752%
Fochriw Road	South of junction with Bogey Road	39	2%	0	0%
Fochriw Road	North of junction with South Tunnel Road	686	27%	327	131%
Fochriw Road	Between junction with South Tunnel Road and junction with Bogey Road	514	21%	324	142%
South Tunnel Road	East of junction with Fochriw Road	39	3%	0	0%
Fochriw Road	North of junction with unclassified road linking to Pontlloyn Road (through Fochriw village)	39	2%	0	0%
Fochriw Road	South of junction with Rhymney Common Road	172	7%	43	58%
Rhymney Common Road	West of junction with Fochriw Road	73	2%	23	35%
Rhymney Common Road	East of junction with Fochriw Road	99	4%	20	54%
Rhymney Common Road	East of ASDA Roundabout	73	2%	23	16%
Road north of Dowlais Top Roundabout	South of ASDA Roundabout	73	1%	23	9%

Road	Route description	Change in 2015 weekday flows due to scheme			
		Total change	Total % change	HGV change	HGV % change
A465 Heads of the Valleys Road	West of A4060 Roundabout	60	0%	10	1%
A465 Heads of the Valleys Road	East of A4060 Roundabout	0	0%	0	0%
A4060	South of A465 Roundabout	13	0%	13	1%
Rhymney Common Road	North of A465/A469 Dumbbell Roundabout	99	4%	20	54%
A465 Heads of the Valleys Road	Eastbound entry slip road (A469)	39	2%	10	14%
A469	Between A465/A469 Dumbbell Roundabouts	60	1%	10	6%
A465 Heads of the Valleys Road	Eastbound exit slip road (A469)	0	0%	0	0%
A465 Heads of the Valleys Road	Westbound exit slip road (A469)	39	2%	10	28%
A465 Heads of the Valleys Road	Westbound entry slip (A469)	0	0%	0	0%
B4257	East of A465/A469 Dumbbell Roundabouts	11	0%	0	0%
A469	South of A465/A469 Dumbbell Roundabouts	11	0%	0	0%

Significance of Impacts

Highway operation

7.103 Tables 7.7 and 7.8 show that there would be changes to the traffic flows on some of the links within the study area. The magnitude of the traffic flow impact is major on some links, with an increase in traffic volume of 48% (all traffic) and 752% (HGV traffic) on Bogey Road (although to the west of CDP Access Point 'C', where HGV movements are banned, the increase is significantly lower), and a corresponding increase of 21% and 142% on Fochriw Road between its junction with South Tunnel Road and the site access.

7.104 These increases are imposed upon baseline data which was collected prior to the implementation of the 7.5 tonne weight limit on Bogey Road in May 2012. As such, some through HGV traffic which would previously have used the entire length of Bogey Road before the May 2012 restriction was in place, will have been redistributed via the A4060, Rhymney Common Road and Fochriw Road. The impact of the additional traffic associated with the development may therefore be overstated on Rhymney Common Road and Fochriw Road in percentage terms, as baseline flows may be higher on those roads than is shown in Table 7.3. Irrespective of these considerations, the traffic flow increase is major, but it is imposed upon a highway network with low background traffic flows and substantial spare capacity, and so the network is considered to have a low sensitivity to traffic flow changes.

7.105 The 752% (HGV traffic) increase on Bogey Road will only occur over a short link to the east of CDP Access Point 'B', and this road is not sensitive to changes in traffic flow. To confirm the validity of this assertion, a capacity assessment was undertaken for the Bogey Road/Fochriw Road junction using the PICADY modelling software. The results are presented in "Nant Llesg Surface Mine Technical Note 03" (Mott MacDonald, November 2012) Appendix MA-NL-ES-A07-001. A very worst case scenario has been tested, using the following assumptions:

- a peak hour of 0800 to 0900, identified from the 2010 ATC data for Bogey Road and Fochriw Road;
- 2010 baseline traffic flows factored to a 2020 assessment year using a TEMPRO/NTEM growth factor of 1.1128. The baseline traffic flows include a maximum of five two-way HGV movements per hour associated with the export of coal from CDP via Bogey Road and Fochriw Road;
- all HGV deliveries/despaches distributed evenly throughout the working day (0700 to 1900), i.e. 12 two-way HGV movements per hour associated with the haulage of extracted coal;
- all daily car/LGV movements assumed to enter/exit the Nant Llesg site between 0800 and 0900;
- 100% of the baseline eastbound flow on Bogey Road assumed to turn right onto Fochriw Road (South); and
- 100% of the baseline westbound flow on Bogey Road assumed to have turned right from Fochriw Road (North).

7.106 A maximum threshold of 0.85 is normally considered the desirable Ratio of Flow to Capacity (RFC) at which a junction can operate satisfactorily. However, a junction will continue to operate adequately up to theoretical maximum capacity threshold with an RFC value of 1.0. If this threshold is exceeded on any arm, delays to that traffic tend to

increase disproportionately with the potential for congestion and considerable queue lengths.

7.107 The results of the capacity assessment are presented in Table 7.9 below. These include assessment of an improved junction arrangement, with visibility to the right (i.e. south) of Bogey Road being improved from the current 70m to 160m (involving the re-profiling of the carriageway), to improve the safety of turning HGVs (see Mitigation).

Table 7.9: Results of PICADY junction capacity assessment, Bogey Road/Fochriw Road

Arm	Description	2010 Base & Existing Layout		2020 Dev & Existing Layout		2020 Dev & Improved Layout	
		RFC	Queue	RFC	Queue	RFC	Queue
A	Fochriw Road (S)	-	-	-	-	-	-
B	Bogey Road	0.100	0	0.168	0	0.155	0
C	Fochriw Road (N)	0.140	0	0.368	1	0.339	1

7.108 The results demonstrate that the Bogey Road/Fochriw Road junction will operate satisfactorily in all future conditions with no adverse queuing predicted. The improvement to the junction sightline visibility does slightly improve the capacity results although this should have no overall impact on the operation of the junction.

7.109 As the increase in traffic flows on other links is, in both absolute and percentage terms, lower than on Bogey Road and Fochriw Road, it is concluded that the additional traffic associated with the development can be adequately accommodated on the highway network. It is therefore considered that the scheme would have a **minor adverse** temporary (long term) impact on the operation of the local highway network.

Other impacts

7.110 The significance of other impacts with respect to transport can be summarised as follows:

- in respect of highway safety, the magnitude of traffic flow changes is major (i.e. 10% or greater) on some road links. Although the number of sensitive receptors along these links is small, it is considered that the increase in HGV turning movements at the Bogey Road/Fochriw Road junction would result in a **moderate adverse** temporary (long term) impact if highway improvements are not made;
- in respect of non-motorised users, major changes in traffic flow on Rhymney Common Road could affect users of National Cycle Network route 46, although the number of pedestrians and cyclists is low. A **minor adverse** temporary (long term) impact is therefore anticipated; and
- in respect of physical fitness, due to the very small number of residential dwellings it is considered that the project will have a **neutral** impact. It is unlikely that the

project would lead to a significant change in physical activity (i.e. walking or cycling) by a substantial number of people.

Assessment of Decommissioning, Restoration and Aftercare Impacts

Description of Impacts

- 7.111 The extraction of coal from Nant Llesg is scheduled to cease in 2024. During the following three years, the void left by the coaling operations will be backfilled and restored to its final contours using overburden and soils stored within the site. By December 2027 these works will be completed as well as the decommissioning of plant, machinery and buildings. It is assumed that all plant will be removed from site, with the same levels of traffic generation and the same number of abnormal loads as during the site enabling works. Restoration works are scheduled to take a total of approximately three years, and will include preparation of the landscape/water features and public rights of way. Following the completion of restoration, and lasting a minimum of 5 years, aftercare works will take place. These involve predominantly agricultural operations to rehabilitate the land surface ready for the proposed after-use.
- 7.112 The maximum number of site personnel will reduce from approximately 265 at the end of coal extraction to 131 during the latter phases of site restoration (in the second and third quarters of 2027). Additionally there will be a significant reduction in the number of HGV movements as the coal extraction will have ceased at this time. Given that the number of traffic movements associated with the restoration phase will be much reduced as compared with the operational phase, a full traffic assessment of this phase has not been undertaken. As presented in paragraph 1.76, it is predicted that baseline traffic will continue to grow across the local highway network. However, paragraphs 1.102 to 1.108 demonstrate that the local highway network has significant spare capacity and Table 7.8 demonstrates that the potential impacts of the development on the wider highway network are negligible.
- 7.113 It is anticipated that approximately 10 sub-contractor personnel will be employed to undertake aftercare works. A small number of HGV deliveries/collections (estimated at approximately 10 two-way movements per month) are anticipated during restoration. The estimated traffic flow impact on local roads during site aftercare has been estimated for a 2029 design year, i.e. 15 years from the commencement of site enabling works, as agreed during scoping discussions with CCBC at the meeting held on 18th October 2011. This is shown in Table 7.10 and illustrated geographically within Drawing MA/NL/ES/07/008.

Table 7.10: Traffic flow impact during site aftercare (total numbers)

Road	Route description	2029 Baseline			2029 during site aftercare		
		AADT	HGVs	HGV %	AADT	HGVs	HGV %
Bogey Road	West of junction with Fochriw Road	1192	52	4.3%	1201	52	4.31%
Fochriw Road	South of junction with Bogey Road	2704	76	2.8%	2706	76	2.82%
Fochriw Road	North of junction with South Tunnel Road	3006	299	10.0%	3028	300	9.92%
Fochriw Road	Between junction with South Tunnel Road and junction with Bogey Road	3010	275	9.1%	3022	275	9.09%
South Tunnel Road	East of junction with Fochriw Road	1507	62	4.1%	1509	62	4.11%
Fochriw Road	North of junction with unclassified road linking to Pontlottyn Road (through Fochriw village)	2662	90	3.4%	2664	90	3.38%
Fochriw Road	South of junction with Rhymney Common Road	2841	89	3.1%	2850	90	3.15%
Rhymney Common Road	West of junction with Fochriw Road	4764	80	1.7%	4768	81	1.69%
Rhymney Common Road	East of junction with Fochriw Road	2694	44	1.6%	2699	45	1.66%
Rhymney Common Road	East of ASDA Roundabout	4879	167	3.4%	4882	167	3.43%
Road north of Dowlais Top Roundabout	South of ASDA Roundabout	13940	314	2.3%	13943	315	2.26%
A465 Heads of the Valleys Road	West of A4060 Roundabout	20143	1509	7.5%	20147	1510	7.49%
A465 Heads of the Valleys Road	East of A4060 Roundabout	28336	2179	7.7%	28336	2179	7.69%
A4060	South of A465 Roundabout	14906	1095	7.3%	14907	1096	7.35%

Road	Route description	2029 Baseline			2029 during site aftercare		
		AADT	HGVs	HGV %	AADT	HGVs	HGV %
Rhymney Common Road	North of A465/A469 Dumbbell Roundabout	2704	44	1.6%	2709	45	1.66%
A465 Heads of the Valleys Road	Eastbound entry slip road (A469)	2204	89	4.0%	2206	89	4.03%
A469	Between A465/A469 Dumbbell Roundabouts	7428	210	2.8%	7432	210	2.82%
A465 Heads of the Valleys Road	Eastbound exit slip road (A469)	3404	93	2.7%	3404	93	2.74%
A465 Heads of the Valleys Road	Westbound exit slip road (A469)	2373	44	1.8%	2375	44	1.84%
A465 Heads of the Valleys Road	Westbound entry slip (A469)	3635	62	1.7%	3635	62	1.71%
B4257	East of A465/A469 Dumbbell Roundabouts	3540	55	1.5%	3540	55	1.54%
A469	South of A465/A469 Dumbbell Roundabouts	9509	219	2.3%	9509	219	2.30%

7.114 Table 7.11 demonstrates the impact of the project during aftercare in terms of percentage changes to the total traffic flows and HGV movements.

Table 7.11: Traffic flow impact during site aftercare (percentage)

Road	Route description	Change in 2029 weekday flows due to scheme			
		Total change	Total % change	HGV change	HGV % change
Bogey Road	West of junction with Fochriw Road	9	1%	0	0%
Fochriw Road	South of junction with Bogey Road	2	0%	0	0%
Fochriw Road	North of junction with South Tunnel Road	23	1%	1	0%
Fochriw Road	Between junction with South Tunnel Road and junction with Bogey Road	12	0%	0	0%
South Tunnel Road	East of junction with Fochriw Road	2	0%	0	0%
Fochriw Road	North of junction with unclassified road linking to Pontlloyn Road (through Fochriw village)	2	0%	0	0%
Fochriw Road	South of junction with Rhymney Common Road	9	0%	1	1%
Rhymney Common Road	West of junction with Fochriw Road	4	0%	0	1%
Rhymney Common Road	East of junction with Fochriw Road	5	0%	0	1%
Rhymney Common Road	East of ASDA Roundabout	4	0%	0	0%
Road north of Dowlais Top Roundabout	South of ASDA Roundabout	4	0%	0	0%

Road	Route description	Change in 2029 weekday flows due to scheme			
		Total change	Total % change	HGV change	HGV % change
A465 Heads of the Valleys Road	West of A4060 Roundabout	3	0%	0	0%
A465 Heads of the Valleys Road	East of A4060 Roundabout	0	0%	0	0%
A4060	South of A465 Roundabout	0	0%	0	0%
Rhymney Common Road	North of A465/A469 Dumbbell Roundabout	5	0%	0	1%
A465 Heads of the Valleys Road	Eastbound entry slip road (A469)	2	0%	0	0%
A469	Between A465/A469 Dumbbell Roundabouts	3	0%	0	0%
A465 Heads of the Valleys Road	Eastbound exit slip road (A469)	0	0%	0	0%
A465 Heads of the Valleys Road	Westbound exit slip road (A469)	2	0%	0	0%
A465 Heads of the Valleys Road	Westbound entry slip (A469)	0	0%	0	0%
B4257	East of A465/A469 Dumbbell Roundabouts	1	0%	0	0%
A469	South of A465/A469 Dumbbell Roundabouts	1	0%	0	0%

Significance of Impacts

7.115 The significance of impacts during site aftercare with respect to transport can be summarised as follows:

- in respect of highway safety and operation, the magnitude of traffic flow changes is negligible or slight on all road links. It is therefore considered that there will be a **negligible adverse** permanent impact for both criteria;
- in respect of non-motorised users, low numbers of pedestrians and cyclists are present but this may change with decommissioning, restoration and aftercare works and the potential creation of new pedestrian and cycle linkages through the site. A **minor beneficial** permanent impact is therefore assessed; and
- in respect of physical fitness, although the number of residential dwellings in the immediate vicinity is very small, the potential creation of new pedestrian and cycle linkages could lead to an increase in walking and cycling activity, particularly by residents of Fochriw and Pontlloftyn. It is therefore considered that the project will have a **minor beneficial** permanent impact.

Mitigation

7.116 If the Nant Llesg Surface Mine, Incorporating Land Remediation project was implemented, there would be an increase in traffic movements on the local highway network during the site enabling works and site operation in particular. Measures to mitigate these impacts would be:

- Site Environmental Management Plan (SEMP);
- Off-site highway improvements; and
- Site Travel Plan.

7.117 These measures are outlined in the following sections.

Site Environmental Management Plan

7.118 Continuing the environmental best practice implemented for FLRS, to ensure the impact of the traffic related to the project is minimised, a number of proposals would be implemented through a Site Environmental Management Plan (SEMP). The measures specific to transport issues would include the following:

- Restricted hours of operation, to include restriction on hours which vehicles can enter and leave the site. HGV movements, including coal haulage from Nant Llesg to CDP, will be restricted to 0700 to 1900 Mondays to Fridays and 0700 to 1400 on Saturdays.
- Development of an HGV routing agreement to ensure that all HGVs (Miller Argent, sub-contractors and material deliveries) are restricted to using defined routes. Whenever possible HGVs will access the site from the A465/A4060 Dowlais Top

Roundabout or the A465/A469 dumbbell roundabout, continuing via Rhymney Common Road and Fochriw Road;

- Abnormal loads (these will be needed to transport large objects such as dump trucks) will travel on agreed routes and will be supervised by a dedicated team and escorted by the local police;
- Appropriate vehicle washing facilities will be provided as per the FLRS site to ensure that mud would not be transferred from the Nant Llesg site onto local roads. If on any occasion mud is accidentally deposited on local roads, the routes would be cleaned immediately.

Proposed off-site highway improvements

7.119 Although PIA data analysis indicates that the accidents in the vicinity of the Fochriw Road/Bogey Road priority T-junction do not represent a statistically significant cluster, the restricted visibility to the south of this junction is a potential road safety concern given the major increase in the number of HGV turning movements during site operation.

7.120 A **moderate adverse** temporary (long term) impact with respect to highway safety is anticipated; however this impact could be mitigated with junction improvement works. The applicant is therefore volunteering off-site highway improvements to address such concerns. The proposed works would include:

- carriageway re-profiling on Fochriw Road, to the south of the junction, to improve visibility to the south for vehicles entering/exiting Bogey Road from the current 70m 'y' distance to approximately 160m;
- carriageway resurfacing on the other approaches to the junction, i.e. Bogey Road and Fochriw Road (North); and
- the installation of directional and junction warning signs.

7.121 With junction improvement works, it is considered that the impact significance during site operation with respect to highway safety could be reduced from moderate adverse to a **minor adverse** temporary (long term) impact.

Site Travel Plan

Introduction

7.122 To further manage the impacts of traffic generated by the project on the local highway network, the applicant will introduce a Site Travel Plan to encourage the use of sustainable modes of travel by staff, operatives and visitors as well as improving access to the site for potential new employees. Travel Plans are widely supported by national and regional policy guidance including TAN 18 (Transport) and the SEWTA Regional Transport Plan. A proposed framework for the Site Travel Plan is set out below.

Objectives

7.123 Objectives for the new Travel Plan may include the following:

- To ensure staff, operatives and visitors are aware of car sharing options (staff only), cycle routes and public transport options (for the main part of the journey to the site); and
- To reduce single-occupancy car use amongst Miller Argent staff and operatives.

Initiatives

7.124 A “tool-kit” of measures which could possibly be implemented when the proposed development becomes operational is set out below.

- A Travel Plan Co-ordinator will be appointed to co-ordinate and promote the use of sustainable travel for journeys to and from the site by staff and visitors, liaising with Caerphilly County Borough Council and making use of local travel planning resources such as www.gettravelwise.com. The Co-ordinator will also monitor the success of various measures and develop new measures as necessary;
- There will be a full amenity block incorporating changing and washing facilities as well as secure lockers;
- Covered and secure cycle parking provision;
- Place sustainable travel information on staff noticeboards. This could include staff home postcode plots to encourage car sharing, and information on the potential travel cost savings. The Wales car sharing database www.liftshare.com/wales should also be promoted. Information on cycling routes and the nearest public transport hubs could also be provided. The Travel Plan Co-ordinator will be responsible for keeping this information up to date; and
- When issuing location details to business visitors, provide information on how to travel to local railway stations near to the site by public transport along with details of local taxi operators or the possible provision of courtesy transport to facilitate access to and from local railway stations.

7.125 However, the Travel Plan is a dynamic process, and the appropriate measures will evolve over time in accordance with changing circumstances.

Targets

7.126 Realistic mode share targets, commensurate with the location and nature of the Nant Llesg site, should be included in the Site Travel Plan. These should be based on a detailed understanding of staff, operative and visitor travel patterns. Within a period of six months of the site becoming operational, a short travel questionnaire could be distributed (potentially via staff newsletter) to identify the modal split, with the Travel Plan Co-ordinator sharing the results with the local authority to identify realistic targets and agree whether any additional measures or initiatives are needed to achieve these.

Monitoring

7.127 Regular monitoring of the Site Travel Plan is essential to review progress against the identified targets, evaluate which measures have been successful and those which have been less successful, and develop new measures with the participation of staff and operatives. Snapshot surveys of staff, operative and visitor travel patterns should be undertaken, and Site Travel Plan results and experiences should be an agenda item at employee meetings, being fed back to staff and operatives via newsletters. Surveys should be undertaken and new targets set and reviewed annually.

Cumulative Impacts

7.128 A cumulative impact assessment has been undertaken to review the potential traffic impact of the Development and the recently permitted Wood Pellet Facility located at Capital Valley Eco-Park, Rhymney. The assessment has been undertaken to determine whether any significant impacts could be caused by cumulative traffic generation which may not be considered within the individual site assessments for each of the sites.

7.129 It is understood that the Wood Pellet Facility will produce up to 39,000 tonnes of pellets per year and the wood will be received from the local area. The facility will be operational 24 hours a day and will run 7 days a week, although traffic movements are expected to occur Monday to Friday from 0700 to 1800 and on Saturday mornings.

7.130 The information provided within the Transport Statement (document ref: 1203-12/TS/01) produced by Transport Planning Associates has been reviewed and the following vehicle movements have been identified.

- The facility will generate a total of 44 HGV movements per day and the majority of these will be routed to the north along the A469 and will then use the A465 "Heads of the Valleys Road" to connect with the surrounding area.
- A total of 32 private car movements will be generated by the 16 staff who will be employed at the site.

7.131 For the purposes of the cumulative assessment it has been assumed that the Wood Pellet Facility is fully operational by 2014 and that all vehicles are routed to the north and then split 50 / 50 on each direction of the A465 "Heads of the Valleys Road".

7.132 The cumulative impacts of the traffic generated by both development schemes within the operational phase of the Nant Llesg development are presented in Tables 7.12 and 7.13 below. The cumulative impacts have been assessed against the worst case scenario for the development, which is the operational phase. As explained in paragraph 1.111, the impacts during any other phase would be of a lesser magnitude and have therefore not been assessed. In later years of the development it is possible that other developments may come forward and which could have a cumulative traffic impact. However, at this time it is only possible to assume that these have been accounted for in the baseline traffic growth allowances. As demonstrated in paragraph 1.93 and paragraphs 1.102 to 1.108, it is not anticipated that the capacity of the local highway network will be exceeded because the geometry of local roads and the low number of junctions and private access points allows significantly greater volumes of traffic to be accommodated than those which are predicted during the operational phase. If any major development comes forward at a future date, it will be appropriate for that developer to consider the potential cumulative impacts at that time.

Table 7.12 Cumulative traffic flow impact during site operation (total numbers)

Road	Route description	2015 Baseline			2015 cumulative impacts		
		AADT	HGVs	HGV %	AADT	HGVs	HGV %
Bogey Road	West of junction with Fochriw Road	992	43	4.3%	1467	367	25.0%
Fochriw Road	South of junction with Bogey Road	2251	64	2.8%	2290	64	2.8%
Fochriw Road	North of junction with South Tunnel Road	2502	249	10.0%	3188	576	18.1%
Fochriw Road	Between junction with South Tunnel Road and junction with Bogey Road	2505	229	9.1%	3020	553	18.3%
South Tunnel Road	East of junction with Fochriw Road	1254	52	4.1%	1293	52	4.0%
Fochriw Road	North of junction with unclassified road linking to Pontlottyn Road (through Fochriw village)	2216	75	3.4%	2255	75	3.3%
Fochriw Road	South of junction with Rhymney Common Road	2365	74	3.1%	2537	117	4.6%
Rhymney Common Road	West of junction with Fochriw Road	3966	67	1.7%	4039	90	2.2%
Rhymney Common Road	East of junction with Fochriw Road	2242	37	1.6%	2341	57	2.4%
Rhymney Common Road	East of ASDA Roundabout	4098	140	3.4%	4172	163	3.9%
Road north of Dowlais Top Roundabout	South of ASDA Roundabout	11582	261	2.3%	11655	284	2.4%
A465 Heads of the Valleys Road	West of A4060 Roundabout	16654	1248	7.5%	16733	1269	7.6%

Road	Route description	2015 Baseline			2015 cumulative impacts		
		AADT	HGVs	HGV %	AADT	HGVs	HGV %
A465 Heads of the Valleys Road	East of A4060 Roundabout	23427	1802	7.7%	23465	1824	7.8%
A4060	South of A465 Roundabout	12324	906	7.3%	12356	930	7.5%
Rhymney Common Road	North of A465/A469 Dumbbell Roundabout	2251	37	1.6%	2350	57	2.4%
A465 Heads of the Valleys Road	Eastbound entry slip road (A469)	1806	73	4.1%	1863	94	5.1%
A469	Between A465/A469 Dumbbell Roundabouts	6115	174	2.8%	6213	206	3.3%
A465 Heads of the Valleys Road	Eastbound exit slip road (A469)	2788	76	2.7%	2807	87	3.1%
A465 Heads of the Valleys Road	Westbound exit slip road (A469)	1944	36	1.8%	2002	57	2.8%
A465 Heads of the Valleys Road	Westbound entry slip (A469)	2978	51	1.7%	2997	62	2.1%
B4257	East of A465/A469 Dumbbell Roundabouts	2914	45	1.5%	2925	45	1.5%
A469	South of A465/A469 Dumbbell Roundabouts	7827	180	2.3%	7914	224	2.8%

7.133 As shown in Tables 7.12 and 7.13, the cumulative assessment has identified that the impacts are limited and do not affect sensitive parts of the highway network included within the study area. In summary, these results do not alter the findings presented in paragraphs 1.97 to 1.104.

Table 7.13 Cumulative traffic flow impact during site operation (percentage)

Road	Route description	Change in 2015 weekday flows due to cumulative impacts			
		Total change	Total % change	HGV change	HGV % change
Bogey Road	West of junction with Fochriw Road	475	48%	324	752%
Fochriw Road	South of junction with Bogey Road	39	2%	0	0%
Fochriw Road	North of junction with South Tunnel Road	686	27%	327	131%
Fochriw Road	Between junction with South Tunnel Road and junction with Bogey Road	514	21%	324	142%
South Tunnel Road	East of junction with Fochriw Road	39	3%	0	0%
Fochriw Road	North of junction with unclassified road linking to Pontlloyn Road (through Fochriw village)	39	2%	0	0%
Fochriw Road	South of junction with Rhymney Common Road	172	7%	43	58%
Rhymney Common Road	West of junction with Fochriw Road	73	2%	23	35%
Rhymney Common Road	East of junction with Fochriw Road	99	4%	20	54%
Rhymney Common Road	East of ASDA Roundabout	73	2%	23	16%
Road north of Dowlais Top	South of ASDA Roundabout	73	1%	23	9%

Road	Route description	Change in 2015 weekday flows due to cumulative impacts			
		Total change	Total % change	HGV change	HGV % change
Roundabout					
A465 Heads of the Valleys Road	West of A4060 Roundabout	79	0%	21	2%
A465 Heads of the Valleys Road	East of A4060 Roundabout	38	0%	22	1%
A4060	South of A465 Roundabout	32	0%	24	3%
Rhymney Common Road	North of A465/A469 Dumbbell Roundabout	99	4%	20	54%
A465 Heads of the Valleys Road	Eastbound entry slip road (A469)	58	3%	21	29%
A469	Between A465/A469 Dumbbell Roundabouts	98	2%	32	18%
A465 Heads of the Valleys Road	Eastbound exit slip road (A469)	19	1%	11	14%
A465 Heads of the Valleys Road	Westbound exit slip road (A469)	58	3%	21	59%
A465 Heads of the Valleys Road	Westbound entry slip (A469)	19	1%	11	22%
B4257	East of A465/A469 Dumbbell Roundabouts	11	0%	0	0%
A469	South of A465/A469 Dumbbell Roundabouts	87	1%	44	24%

Summary

7.134 The significance of impacts with respect to transport during the project is summarised in Tables 7.14 to 7.16. The tables also present the residual impacts of the project (following mitigation). The tables do not present impacts during restoration, as these have not been specifically modelled. However it is anticipated that they will be less significant than the impacts during site operation, using professional judgement.

7.135 Table 7.14 shows that the residual transport impacts (i.e. following mitigation) of the development during site enabling works are anticipated to be **minor adverse** temporary (medium term) with respect to highway safety due to the small number of sensitive receptors along local road links, **negligible adverse** temporary (medium term) in respect of highway operation as Fochriw Road and Bogey Road are single carriageway roads with adequate geometries and a low number of access points, **minor adverse** temporary (medium term) in respect of non-motorised users as the number of pedestrians and cyclists is low, and a **neutral** impact on physical fitness as there are very few people living adjacent to the site or the main HGV routes to it who would be discouraged from walking or cycling.

Table 7.14: Summary of transport impacts during site enabling works – Nant Llesg Surface Mine, Incorporating Land Remediation

Impact	Impact magnitude	Mitigation	Residual impact magnitude
Highway safety	Minor adverse (temporary medium term)	<ul style="list-style-type: none"> Off-site highway improvements (Bogey Road/Fochriw Road) Site Environmental Management Plan 	Minor adverse (temporary medium term)
Highway operation	Negligible adverse (temporary medium term)		Negligible adverse (temporary medium term)
Non-motorised users	Minor adverse (temporary medium term)		Minor adverse (temporary medium term)
Physical fitness	Neutral		Neutral

7.2 Table 7.15 shows that the residual transport impacts of the development during site operation are anticipated to be **minor adverse** temporary (long term) with respect to highway safety due to the small number of sensitive receptors along local road links, **minor adverse** temporary (long term) in respect of highway operation as Fochriw Road and Bogey Road are single carriageway roads with adequate geometries and a low number of access points, **minor adverse** temporary (long term) in respect of non-motorised users as the number of pedestrians and cyclists is low, and a **neutral** impact on physical fitness as there are very few people living adjacent to the site or the main HGV routes to it who would be discouraged from walking or cycling.

Table 7.15: Summary of transport impacts during site operation – Nant Llesg Surface Mine, Incorporating Land Remediation

Impact	Impact magnitude	Mitigation	Residual impact magnitude
Highway safety	Moderate adverse (temporary long term)	<ul style="list-style-type: none"> Off-site highway improvements (Bogey Road/Fochriw Road) Site Environmental Management Plan 	Minor adverse (temporary long term)
Highway operation	Minor adverse (temporary long term)		Minor adverse (temporary long term)
Non-motorised users	Minor adverse (temporary long term)		Minor adverse (temporary long term)
Physical fitness	Neutral		Neutral

7.2 Table 7.14 shows that the residual transport impacts of the development during site aftercare are anticipated to be negligible **adverse** permanent with respect to highway safety and operation due to the negligible or slight change in traffic flow on local road links, and **minor beneficial** permanent in respect of non-motorised users and physical fitness as there may be an increased number of pedestrians and cyclists (and therefore an increase in physical activity) with the creation of new links through the site.

Table 7.16: Summary of transport impacts during site aftercare – Nant Llesg Surface Mine, Incorporating Land Remediation

Impact	Impact magnitude	Mitigation	Residual impact magnitude
Highway safety	Negligible adverse (permanent)	<ul style="list-style-type: none"> Off-site highway improvements (Bogey Road/Fochriw Road) Site Environmental Management Plan 	Negligible adverse (permanent)
Highway operation	Negligible adverse (permanent)		Negligible adverse (permanent)
Non-motorised users	Minor beneficial (permanent)		Minor beneficial (permanent)
Physical fitness	Minor beneficial (permanent)		Minor beneficial (permanent)

- 7.3 In accordance with the defined significance criteria, only impacts of major or moderate magnitude are considered significant in terms of the EIA Regulations, therefore the transport impacts of the project summarised above are assessed as **not significant**, following mitigation.
- 7.4 The cumulative assessment has identified that there are **no significant impacts** on sensitive parts of the highway network associated with other committed developments and so the findings of Tables 7.14 to 7.16 are unaltered.
- 7.5 With respect to the impacts of the project upon the operation of the rail network, these are considered to be **neutral** as it will remain well within capacity.

Nant Llesg Surface Mine

Incorporating Land Remediation

Chapter 8

Ecology and Nature Conservation

Nant Llesg Surface Mine

Incorporating Land Remediation

Environmental Statement

Chapter 8 - Ecology and Nature Conservation

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8 Ecology and Nature Conservation

Chapter overview

- 8.1 Sites of importance for nature conservation, habitats, species populations, and species assemblages present within and in the vicinity of the site have been identified through desk study and surveys. The effects of the Nant Llesg proposals on ecology and nature conservation have been assessed taking into account measures to avoid or reduce the effects which are integral to the design of the project and which will be secured as part of the proposal.
- 8.2 The restoration and aftercare proposals for the site take account of the habitats and species currently present within the site, and seek to re-establish topographical, soil and drainage conditions and management practices which would support these habitats and species. In particular habitats and species included in the Caerphilly Biodiversity Action Plan (BAP) have been taken into account. Local BAPs are intended to focus resources to conserve and enhance biodiversity by taking account of national and local priorities. Thus the restoration and after care proposals include specific measures to reinstate wet dwarf shrub heath in the area south of Rhaslas Pond. New ponds would be created by modifying the water treatment areas used for the development, and elsewhere, and watercourses would be established as part of the drainage of the restored site. A network of hedgerows would be established within the farmland area in the north of site, with new woodland areas here and in the east of the site. The restored site would provide habitat for Caerphilly BAP species such as great crested newt and other amphibians, common lizard, bats, otter, lapwing and a range of other breeding and wintering birds.
- 8.3 For the purposes of the assessment, the land take of the scheme as a result of site clearance and the working of the site are considered first. In practice a high proportion of this land take would take place in the early stages of working as a result of clearing and stripping the land required for the soil and overburden stores, and the initial box cut, as well as the areas for the site offices, workshops and other facilities. The remaining land take would take place in small increments as the scheme progressed. Since most of the land take occurs in the early stages of the scheme there is little to be gained from assessment of the effects of the land take for individual stages of the scheme separately, and thus the effects of the overall land take are assessed together.
- 8.4 The operational effects of the mining operation are assessed next. These are the additional effects, over and above the effects of the land take, and include effects arising from the activity on site such as noise generated by site activities, disturbance of wildlife as a result of vehicle and pedestrian movements, risk of spills or leaks of fuel, oil, and chemicals, pollution as a result of site drainage; and dust deposition on vegetation. These effects would occur throughout the scheme. They are assessed against the impact of land take, rather than against the baseline situation prior to commencement of the Nant Llesg development and are intended to show the additional effects of activity, in addition to the effects of land take. This is the logical approach to assessment of these effects since they would only occur if the land take for the scheme took place, so it is not reasonable or practical to assess them against the existing baseline.
- 8.5 The Restoration Strategy forms the basis for the assessment of the effects of the restoration of the site. This is a comparison of the ecological characteristics of the restored landform and vegetation against the baseline situation before the commencement of the scheme.
- 8.6 As a result of the land take of the project there would be an impact of major significance on breeding birds (in particular the loss of the nesting area for two pairs of little ringed plover, suitable habitat for which would be reinstated on restoration). There would be impacts of moderate significance on non-statutory designated sites (loss of much of the Cefn Gelligaer SINC, although this would be restored on completion of the scheme), habitat loss (particularly wet heath, unimproved acid grassland and marshy grassland), wintering/passage birds (especially those associated with Rhaslas Pond), terrestrial invertebrates (including grayling and small heath butterflies and broom moth), and dragonflies and damselflies (including the scarce blue-tailed damselfly). Suitable habitat for species which currently occur on the site

- would be reinstated on restoration. Other than for these instances, the remainder of the ecological effects would be of negligible or minor significance.
- 8.7 During operation of the site no additional adverse effects would be of greater than minor significance. There would potentially be beneficial effects on amphibians and bats as a result of habitat creation (and for amphibians, through provision of road crossings), and to otter and fish as a result of improvements to downstream water quality.
- 8.8 Comparing the restored site with the baseline, the majority of effects would be of negligible or minor significance. There would be potential moderate adverse effects on non-statutory sites and habitats, breeding and wintering/passage birds (taking account of the long timescales required for full recovery of the restored areas).. There are likely to be beneficial effects on amphibians, reptiles, bats and otter as a result of habitat creation (and for amphibians, provision of road crossings), and on fish as a result of improvements to downstream water quality.
- 8.9 The nature of the proposed development means that it is not possible to fully mitigate the ecological effects of the proposals within the Nant Llesg Site. In order to off-set these effects it is proposed to implement ecological enhancements and management in an area to the south west of Nant Llesg.
- 8.10 The land at Bryn Caerau already contains a variety of habitats of value and supports protected and notable flora and fauna. However, there are a number of opportunities available to enhance the overall ecological value of the area by creating new habitats and by managing both the existing habitats and new habitats created. The land is part of the holding known as Bryn Caerau Farm which is owned by Miller Argent (South Wales) Limited and farmed by tenants. Management of the land at Bryn Caerau would be secured by means of a S106 agreement.
- 8.11 The land at the north of the Nant Llesg site which would be restored to enclosed agricultural grazing land would, at the end of the aftercare period, return to the current landowner who would continue to farm the land.
- 8.12 Management of the land at the south of the Nant Llesg site, following the aftercare period, would be the responsibility of the commoners as is currently the case. This would include the area of restored wet heathland as well as extensive areas of restored grassland to the north and east. These grasslands on mineral soils would provide better quality grazing than the wet heathland areas restored on peat, and it is likely that stock would tend to avoid these areas in favour of the better quality grasslands. Thus in all likelihood, overgrazing of the wet heath would not occur as sheep would tend to use the nearby areas of better grazing on mineral soils which would be comparatively more attractive, as is currently the case. However, as is also currently the case, there can be no guarantee that a favourable grazing regime would continue.
- 8.13 Taking into account the likelihood of the wet heath recovering, the existing and continued threats from overgrazing, and the habitat improvement and management of Bryn Caerau, then the overall balance of biodiversity of the area would be maintained

Introduction

- 8.14 This chapter has been prepared by RPS Planning and Development Limited and describes and assesses the ecology and nature conservation effects of the proposed Nant Llesg Surface Mine including Land Remediation. The habitat types at the site and in its vicinity are described, and the protected and other notable species and areas of nature conservation interest which would be affected by the development of the site are identified. This information has been used to identify likely ecological effects and the measures to avoid or mitigate such effects. The likely significant effects on ecology and nature conservation, taking into account the proposed mitigation measures, are described in this chapter.
- 8.15 The Nant Llesg site includes the northern part of Gelligaer and Merthyr Common (C38) and farmland to the north of the common. Areas proposed to mitigate for the loss of grazing and

public access across the section of the common within the site are also described and the ecological effects of these uses on this land are assessed.

- 8.16 Measures for the ecological enhancement of an area of land at Bryn Caerau Farm to the south west of the Nant Llesg site to offset the ecological effects of the Nant Llesg development are also described.
- 8.17 The settlements of Fochriw and Rhymney lie to the south and east of the Nant Llesg site, and open areas comprising farmland and common lie to the north and to the west (with the overburden mounds of the Ffos y fran Land Reclamation Scheme beyond).

Methodology

- 8.18 The methodology for the assessment of ecological effects takes account of the following relevant guidance:
- Institute of Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment;
 - Department for Transport (2004) Transport Analysis Guidance (TAG): The Biodiversity Sub-Objective (TAG Unit 3.3.10); and
 - Institute of Ecology and Environmental Management (2006) Guidelines for Ecological Impact Assessment in the United Kingdom.
- 8.19 In accordance with this guidance, the assessment has been undertaken in four main stages:
- Baseline studies (review of existing conditions);
 - Identification of ecological receptors;
 - Identification and characterisation of likely effects, including suitable mitigation/compensation measures; and
 - Assessment of significance of effects.
- 8.20 Information relating to sites designated for their nature conservation importance and records of protected (or otherwise important) species was requested for a 2km study area around the site. This study area was extended to 5km for records of otters and bats and for nationally and internationally designated sites. The Desk Study Report is at Appendix MA/NL/ES/A08/001.
- 8.21 The following statutory and non-statutory organisations were consulted.
- Countryside Council for Wales (CCW) ;
 - Environment Agency Wales (EAW);
 - Caerphilly County Borough Council (CCBC);
 - Merthyr Tydfil County Borough Council (MTCBC);
 - Blaenau Gwent County Borough Council (BGCBC);
 - South East Wales Biodiversity Records Centre (SEWBReC);
 - South and West Wales Wildlife Trust (SWWWT); and
 - Biodiversity Information Service for Powys and Brecon Beacons National Park (BIS).

- 8.22 As from 1st April 2013, CCW and EAW have been incorporated into Natural Resources Wales (Cyfoeth Naturiol Cymru) (NRW). For the purposes of this section of the chapter they will be referred to under their former names to make it clear which of the previous organisations is being referred to.
- 8.23 At the request of CCW and the EAW, consideration has also been given to European Sites at greater distances from the site, these being:
- Aberbargoed Grasslands SAC (7.9km);
 - Usk Bat Sites / Safleodd Ystlumod Wysg SAC (8km);
 - Cwm Cadlan SAC (12.5km); and
 - Blaen Cynon SAC (14km).
- 8.24 The following ecological surveys have been carried out at the Nant Llesg Site as part of this EIA.
- Vegetation and habitats;
 - Great crested newt and other amphibians;
 - Reptiles;
 - Bats;
 - Breeding birds;
 - Wintering birds;
 - Otter and water vole;
 - Badger;
 - Aquatic invertebrates;
 - Terrestrial invertebrates;
 - Dragonflies; and
 - Fish.
- 8.25 The results of the ecological surveys are summarised in this chapter and the full reports of the surveys are at Appendices MA/NL/ES/A08/002 to MA/NL/ES/A08/014.

Identification of Ecological Receptors and Ecological Impact Assessment

- 8.26 Having identified, through desk study and surveys, the sites of importance for nature conservation, habitats, species populations, and species assemblages present within the zone of influence of the proposed development, Valued Ecological Receptors (VERs) which could be affected by the project were identified. The receptors identified are set out in the section 'Valued Ecological Receptors' later in this chapter.
- 8.27 Identified sites, populations of species, species assemblages and habitats have been evaluated with reference to their importance in terms of 'biodiversity conservation' (which relates to the

need to conserve representative areas of different habitats and the genetic diversity of species populations).

- 8.28 Where appropriate, reference is made to social benefits that species and habitats deliver (e.g. relating to enjoyment of flora and fauna by the public) and economic benefits that they provide, but only where these are considered, using professional judgement, to be of significance.
- 8.29 The methodology for the assessment of the ecological effects of the Nant Llesg project is set out in the sections 'Assessment Criteria' and Assessment of Significance' later in this chapter.

Scoping and Consultation

- 8.30 An EIA scoping request was sent to Caerphilly County Borough Council (CCBC) in June 2011. Following consultation with a range of consultees, CCBC responded with a Scoping Opinion on 26th August 2011. Appended to the Scoping Opinion were responses from consultees including the Countryside Council for Wales (CCW) and the Environment agency Wales (EAW).
- 8.31 A request for an updated Scoping Opinion was sent to CCBC in December 2011 due to changes made to the proposal. An update scoping opinion was issued by CCBC in March 2012, but with no material changes to the initial scoping opinion.
- 8.32 The key issues raised in the initial Scoping Opinion in relation to ecology and nature conservation are set out in Table 8.1 below.

Table 8.1 Summary of Key Points identified in Scoping Opinion

Matter Raised	Comment
CCW	
Cumulative effects, particularly with respect to the Ffos-y-fran Land Reclamation Scheme.	Cumulative effects are assessed.
Effects of dust emissions on statutory designated sites (SACs and SSSIs). Habitats Regulations Assessment required with respect to SACs.	Potential effects of dust emissions on statutory designated sites are considered and a Habitats Regulations Assessment provided for Aberbargoed Grasslands SAC, Usk Bat Sites SAC, Cwm Cadlan SAC and Blaen Cynon SAC.
Effects of dust emissions on Sites of Importance for Nature Conservation (SINCs)	Potential effects of dust emissions on SINCs are considered.
Effects of dust emissions on Biodiversity Action Plan (BAP) habitats.	Potential effects of dust emissions on BAP Habitats are considered.
Physical and chemical effects of dust emissions on vegetation.	Potential physical and chemical effects of dust emissions on vegetation are considered.
Effects on protected species including great crested newt, breeding birds	Surveys for protected species including great crested newt, breeding birds and reptiles have

Matter Raised	Comment
(including lapwing) and reptiles.	been carried out as described in this section, and the effects on these species are assessed.
Direct and indirect effects on UK and Local BAP habitats including upland heath (particularly to the south of Rhaslas Pond).	NVC survey has been carried out and vegetation and habitats mapped. This information has been used as the basis for the assessment of effects on these habitats.
Direct and indirect effects on UK and Local BAP species.	A comprehensive range of species surveys has been carried out as described in this chapter, and the data collected has been used to assess the direct and indirect effects on UK and Local BAP species.
A Phase 1 Habitat Survey should be carried out adhering to NVC guidelines.	Habitat mapping has been carried out based on Phase 1 Habitat and NVC survey as described in this chapter.
Effects of changes in hydrology on habitats within and adjacent to the site, and on receiving streams and rivers during operation and following reinstatement.	Effects of changes in hydrology on habitats and receiving streams and rivers during operation and following reinstatement have been assessed.
Restoration should aim to enhance the site's biodiversity value and consider the maintenance and enhancement of future habitat connectivity.	Biodiversity is a key element in the restoration scheme and the need for maintenance and enhancement of habitat connectivity is addressed.
EAW	
<p>Ecological survey required to identify:</p> <ul style="list-style-type: none"> • any rare, declining or otherwise important flora, fauna or habitats within the site; • The importance of such features at a local, regional and national level • the impacts of the scheme on those features; • mitigation for adverse ecological effects or compensation for loss; • avoidance of impacts; • wildlife enhancement; • post-project appraisal, management plans and management responsibilities, and • full protected species surveys including great crested newt, water vole, lapwing, bats, reptiles and otter. 	A comprehensive range of ecological surveys has been carried out (including great crested newt, water vole, lapwing, bats, reptiles and otter) as described in this chapter. The findings have informed the assessment of impacts and the need for mitigation and compensation. Opportunities for wildlife enhancement have been considered and the post project monitoring, and management requirements addressed.

Matter Raised	Comment
Watercourses and any waterbodies within the site need to be fully considered.	Full consideration has been given to effects on watercourses and waterbodies within the site.
Any diverted watercourses should include 'soft' engineering options wherever possible.	Soft engineering options will be used subject to the need to maintain the stability of any diverted watercourses.
Potential impacts on hydrogeology and hydrological connectivity should be assessed to inform understanding of potential impacts on surrounding habitats and to inform restoration plans.	The effects of changes in hydrogeology and hydrology on habitats have been assessed and taken into account in development of the restoration scheme.
Impacts on SINC's should be considered and avoided wherever possible. Where impacts are unavoidable there should be proposals for mitigation and compensation on site and if necessary off site in the wider area.	Effects on SINC's have been considered together with mitigation and compensation measures with respect to unavoidable impacts.
Four SACs just beyond 10km from the site have long range air quality issues (Aberbargoed Grasslands SAC, Usk Bat Sites SAC, Cwm Cadlan SAC and Blaen Cynon SAC). The zone of influence of air emissions on designated sites should be established and the ES will need to address the cumulative impacts of the air emissions on air quality affecting these SACs	The potential for effects of air emissions on these SACs have been considered, including cumulative effects.
The ES should include a full restoration and management plan. Consideration should be given to avoidance and mitigation measures to ensure there is no net loss to biodiversity. Enhancement measures should be identified, such as habitat creation, restoration, improvement of features and future management.	A Restoration Strategy has been prepared. Biodiversity has been a key element in the development of this plan.
The ES should consider the effects in combination with the Ffos-y-fran Land Reclamation Scheme.	The effects of the proposals in combination with the Ffos-y-fran Land Reclamation Scheme have been considered.

- 8.33 A meeting was held with the Countryside Council for Wales (CCW) on 22nd July 2011. Matters raised in CCW's response to consultation are set out in Table 8.1 above.
- 8.34 A further meeting was held with CCW on 14th March 2013 to discuss the proposals for provision of alternative areas for grazing and recreation during the operation of the site to offset the temporary loss of common land. The proposals for biodiversity enhancement at Bryn Caerau were also explained.

- 8.35 A meeting was held with Caerphilly County Borough Council (CCBC) on 20th October 2011 to discuss a range of matters including ecology and nature conservation. The Council emphasised the importance of the wet heath and grassland habitats within the Nant Llesg site and that the restoration scheme for the site should be ecology and landscape led. The need to restore the full range of species characteristic of these habitats, including bryophytes, was emphasised.
- 8.36 A further meeting was held on site with CCBC on 4th February 2013 to discuss the proposals for remediation to Fochriw Tip, including ecological considerations. A meeting to discuss the proposals for provision of alternative areas for grazing and recreation during the operation of the site to offset the temporary loss of common land was held with CCBC on 27th March 2013. The proposals for biodiversity enhancement at Bryn Caerau were also discussed.
- 8.37 A meeting to discuss the proposals for provision of alternative areas for grazing and recreation during the operation of the site to offset the temporary loss of common land was held with Merthyr Tydfil County Borough Council (MTCBC) on 27th March 2013. The proposals for biodiversity enhancement at Bryn Caerau were also explained.

Baseline Environment

Climate change

- 8.38 Consideration should be given to the potential for changes in the baseline conditions in the medium to long-term as a result of climate change. Simmons (2003) considered the potential effects of climate change on the moorlands of England and Wales and indicated that, although scenarios were plentiful, certainty about future trends was impossible. He emphasised that the economics of sheep production will be more important for moorland nature conservation in the short to medium term than any climatic shifts.
- 8.39 The potential effects of climate change in the Welsh uplands (specifically SSSIs) have been reviewed by Jones (2007). She reports that:

“Climate change will result in significant seasonal changes in temperature, rainfall and wind which will impact upon most habitats to a greater or lesser extent in the future. The models predict with some certainty that we will have warmer wetter winters with much less snow and frost, while summers will be hotter and drier. However, the extent or rate of climatic changes are difficult to determine owing to the limitations of climate change models and the range of greenhouse gas emission projections for the future. More significant still are the uncertainties of the impacts upon species, soils and the wider ecosystem.....However, there is so much we do not know about these habitats, their response to changing conditions and interactions between climate change and changes in management. Furthermore, the genetic diversity of species and their inherent ability to adapt to a changing climate are as yet largely unquantified for most species; without this we cannot make predictions about their fate under changed climatic conditions.”

- 8.40 She reports in relation to Welsh upland SSSIs that:

“Although climate change will have a range of effects on upland habitats in Wales, the distribution and extent of habitats as outlined on the vision maps is based on current climate and our current knowledge of habitats, species and their responses to environmental variables....”

and

“...to produce alternative climate change scenarios at the moment, based on incomplete knowledge, would be confusing and misleading when the major impact on upland habitats is currently still direct land management.”

- 8.41 Thus for the purposes of this assessment no attempt has been made to predict future changes in the ecological baseline which may arise as a result of climate change. Land management, particularly grazing pressure, is likely to have a greater influence on vegetation over much of the uplands.

Designated Sites

Statutory designated sites

- 8.42 There are 28 sites with a total of 36 statutory designations within the 10km search area. These comprise two Special Areas of Conservation (Aberbargoed Grasslands SAC and Usk Bat Sites SAC), 18 Sites of Special Scientific Interest (SSSI), 11 Local Nature Reserves (LNR) and four Country Parks. Some sites have more than one designation. These are listed in Table 8.2 and shown on Drawing MA/NL/ES/08/001. There are no Special Protection Areas (SPAs) or Ramsar Sites within the search area.
- 8.43 No statutory sites are located within the site boundary.

Table 8.2 Statutory designated sites within 10km of the site

Site Name	Designation	Distance from Site	Description
Brynbach	Country Park	0.5km	The Country Park was created from an extensive coal mining site and now comprises a mosaic of semi-improved neutral and acidic grassland, marshy grassland, plantation coniferous and broadleaved woodland, scrub, ponds and ditches, and a lake. Part of the park is a LNR.
Parc Bryn Bach	LNR	2km	
Parc Cwm Darran & Cwmllywdrew Meadows	Country Park & LNR	1km	The Country Park follows a river valley and comprises woodland and a fishing lake. It incorporates Cwmllywdrew Meadows LNR which comprises three hay meadows, a pond and a small oak woodland and supports protected and notable species.
Lower House Stream Section	SSSI	1.2km	Designated for its palaeontological interest. Not considered further.
Cefn y Brithdir	SSSI	2.7km	This site supports the best example in Mid Glamorgan of a dwarf shrub heath community in which crowberry <i>Empetrum nigrum</i> occurs as a co-dominant species (which is close to the southern edge of its range in Britain). A range of dry heath species are found and the diversity and relative density of the dwarf shrub species is unusual in Mid Glamorgan.

Site Name	Designation	Distance from Site	Description
Cwm Taf Fechan Woodlands	SSSI & LNR	3.5km	Mixed deciduous woodlands with interesting plant communities in flushes around tufa springs and luxuriant growths of bryophytes in the splash zone of the river.
Baltic and Tyle'r-Bont Quarries	SSSI	3.8km	Designated for its geological interest.
Sirhowy Hill Woodlands and Cardiff Pond	LNR	4km	The reserve straddles a mountain ridge and was historically worked for coal. A series of tree planting schemes have taken place since the 1970's and the site now supports 12 bird species of conservation concern, including kestrel and green woodpecker.
Cwm Glo a Glyndyrys	SSSI	4.6km	The site comprises extensive areas of marshy grassland, species-rich neutral grassland and acid grassland plus woodland and heath. It has an outstandingly diverse assemblage of grassland fungi, including 32 species of waxcap <i>Hygrocybe</i> spp, making it one of the best sites in Britain.
Abercriban Quarries	SSSI	4.6km	Designated for its geological interest. Not considered further.
Cwar Yr Ystrad A Cwar Blaen Dyffryn	SSSI	5.1km	Designated for its geological interest. Not considered further.
Nant Glais Caves	SSSI	5.1km	Designated for its geological interest. Not considered further.
Parc Coetir Bargod	Country Park	6.7km	A Country Park created from three old collieries beside the River Rhymney and containing fragments of old woodland.
Beaufort Hills Pond And Woodland	LNR	7km	In the past the site has been subject to heavy industrial activity but when this ceased, the land was reclaimed which involved extensive remodelling and landscaping of the site. The reserve is now of high wildlife value. Surveys have shown that a number of mammals, including bats and otters, are seen here, as well

Site Name	Designation	Distance from Site	Description
			as 12 types of butterfly and 9 types of damselfly including the scarce blue tailed damselfly.
Penmoelallt	SSSI	7.1km	Penmoelallt is of special interest for its ash woodland and its rare and scarce plants including Ley's Whitebeam, one of the rarest trees in the world.
Daren Fach	SSSI	7.2km	An important example of upland ash woodland that has developed over limestone. The site also supports good examples of limestone grassland and the cliffs and scree at Daren Fach and Fawr also support a variety of uncommon plants.
Silent Valley	LNR	7.2km	Silent Valley LNR includes Cwm Merddog Woodlands SSSI and is open woodland, interspersed with wet flushes and areas that were once meadows. The woods form part of one of the most westerly and highest natural beech woods in Britain.
Cwm Merddog Woodlands	SSSI	7.3km	The Cwm Merddog Woodlands comprise an extensive area of beech woodland, part of the site is also the highest known station for beech in Britain. Wetter areas and flushes have a rich flora of mosses, ferns and flowering plants.
Parc Nant-Y-Waun	LNR	7.7km	The Reserve supports a rich variety of plants, mammals, birds and insects. Over 132 species of plants and over 38 bird species have been seen here.
Aberbargoed Grasslands	SAC SSSI	7.9km	Aberbargoed Grasslands is of special interest for its marshy grassland with associated habitats and for a population of the rare marshy fritillary butterfly. It is rich in plant species, and supports a good range of invertebrate species.
Usk Bat Sites / Safleodd Ystumod Wysg & Mynydd Llangatwg (Mynydd Llangattock)	SAC & SSSI	8km	The SAC has been primarily selected to conserve lesser horseshoe bats. The site is made up of several lesser horseshoe bat roosts, upland habitats, woodlands and cave systems located around the valley of the River Usk near to Abergavenny. The base-rich grassland, heather dominated blanket mire, and dry heath, are of special

Site Name	Designation	Distance from Site	Description
			interest. The crags, woodland and grassland of the limestone escarpments support important assemblages of rare and scarce vascular plants, bryophytes and lichens. Parts of cave system are of special interest for the lesser horseshoe bat. Additional habitat interest is provided by wet heath, acid grassland, modified blanket mire, and other less extensive habitats including a small raised mire.
Talybont Reservoir	SSSI & LNR	8.5km	This reservoir is an important inland overwintering site for wildfowl. The uncommon grass, orange foxtail occurs at the south-western end, together with needle spike-rush.
Bryncarnau Grasslands, Llwyncoed	SSSI	8.6km	Bryncarnau Grasslands supports a range of different plant communities, including marshy grassland, acid grassland and species-rich neutral grassland and part of the special interest of the SSSI is in the areas where they meet and merge. The grassland supports many insects and other invertebrates and the wide variety of plants found here allows numerous different insects to thrive.
Nelson Bog	SSSI	9.2km	Nelson bog is a good example of valley mire with a range of habitats from marshy grassland through to swamp and open water communities. The site also supports a diverse bird fauna.
Parc Penallta	Country Park	9.5km	A Country Park containing grasslands, wetlands and woodlands.
Brynmawr Sections	SSSI	9.8km	Designated for its geological interest
Brecon Beacons	SSSI	9.9km	This area is of importance for both geodiversity and biodiversity. Some of the cliffs and slopes in the SSSI support areas of rare mosses, tall-herb vegetation and heathland. Dense woodland is present and is largely dominated by oak, ash and alder. Bog orchid has been recorded in wet flushes below the main escarpment.
Waun Gogh,	SSSI	9.9km	A site comprising species-rich neutral grassland and marshy grassland with associated acid flush.

Site Name	Designation	Distance from Site	Description
Penrhiw-Caradoc			The site supports a large population of soft-leaved sedge <i>Carex montana</i> , a locally rare plant which is scarce in Great Britain and has a restricted distribution in Wales.

Non-statutory designated sites

- 8.44 There is a total of 20 non-statutory designated sites within the 2km search area, all designated as Sites of Importance for Nature Conservation (SINCs). Much of Cefn Gelligaer, west of Deri SINC is within the site boundary, and there are three further SINCs located within 50m of the site boundary. Descriptions of all 14 SINCs are given in Table 8.3 below and their locations are shown in Drawing MA/NL/ES/08/002. There are also several small areas of Ancient Woodland and Plantation on Ancient Woodland Sites within the 2km search area which are shown on Drawing MA/NL/ES/08/002. The nearest is 1.4km from the site.

Table 8.3 Non-statutory designated sites within the 2km search area

Site Name and (County Borough)	Designation	Distance from Site	Description
Cefn Gelligaer, west of Deri (Caerphilly)	SINC	Within site boundary	An extensive upland area of acid grassland, marshy grassland and wet heath plus ponds, flushes, small streams and bare rock. Areas of former mineral workings support dry heath, often with abundant bryophytes, lichens and fungi. Locally significant populations of dragonflies, breeding lapwing and waxcap fungi have been recorded. The site is likely to support good numbers of reptiles, provides potential breeding habitat for wading birds and may support locally significant bryophyte and lichen communities.
Tair Carreg Moor, northwest of Fochriw (Caerphilly)	SINC	10m	An extensive upland area supporting a mosaic of wet and dry acid grassland and heath. Several ponds are present. The site supports locally significant populations of dragonflies, is likely to support reptiles and has the potential to support breeding wading birds, great crested newts and populations of grassland fungi.
Nant Bargod Rhymni, Darran Valley (Caerphilly)	SINC	10m	This SINC comprises almost the full length of the river corridor within the county borough comprising the stream and adjacent semi-natural habitats including lakes in Parc Cwm Darran Country Park. Atlantic salmon, bullhead and brown/sea trout have been recorded. Otter has also been recorded and the site provides potential habitat for foraging and

Site Name and (County Borough)	Designation	Distance from Site	Description
			roosting bats and is likely to have significant local value for bryophytes.
Butetown, Llechryd and Rhmney Grasslands (Caerphilly)	SINC	50m	Several small pieces of land supporting marshy grassland and semi-improved acid grassland with potential to support reptiles, marsh fritillary butterflies and waxcap fungi.
Nant Bargod Flush, Deri (Caerphilly)	SINC	0.3km	The site comprises a mix of marshy grassland and flush vegetation with semi-improved acid grassland, wet woodland and a stream along the boundaries. The site is likely to support good numbers of reptiles, have significant local value for bryophytes, potential to support small pearl-bordered fritillary butterfly and provide foraging opportunities for bats.
Cwm Golau (Merthyr Tydfil)	SINC	0.4km	A small semi-upland valley system comprising mainly valleyside marshy grasslands, with acid grasslands and small areas of wet heathland. Other habitats include dry heath, acid flushes and bracken slopes. Lower sections of the Gyrawd valley are wooded mainly by sessile oak, which may be of ancient origin. Small areas of colliery spoil are present mainly re-vegetated with acid grassland and contain several ponds. The site supports a diverse range of breeding birds including reed bunting, tawny owl, redstart, skylark, snipe, whinchat and wheatear.
Cefn y Brithdir, south of Pontlottyn (Caerphilly)	SINC	0.4km	An extensive upland area supporting a mix of acid grassland and heath and a narrow margin of ancient upland oak woodland. The site is likely to support reptiles and has the potential to support breeding wading birds, uncommon species of bryophytes and lichens and populations of grassland fungi.
Pen March and Traed y Milwyr, Llechryd (Caerphilly)	SINC	0.5km	An extensive upland area supporting a mix of wet and dry acid grassland and heath, several flushes and ditches and two reservoirs. The site provides potential habitat for breeding wading birds, reptiles and uncommon species of bryophytes, lichens and grassland fungi.

Site Name and (County Borough)	Designation	Distance from Site	Description
Blaenmorlais (Merthyr Tydfil)	SINC	1km	A large area supporting a mosaic of upland habitats comprising mainly acid grasslands with some acidic, species-rich flushes, grass-heaths, dry heathlands, marshy grasslands and smaller areas of wet heathland. The site also contains small disused quarries and acid scree, an area of limestone spoil tips supporting unimproved upland calcareous grassland, as well as some limestone outcrops and scree. A section of the Nant Morlais within the site has steep valley sides with rocky outcrops. A large pond supports floating bur-reed, a regionally rare plant, and several uncommon dragonflies. The site supports the grayling butterfly, a population of the nationally rare mossy saxifrage as well as many regionally rare and scarce species. The site is likely to be important for a range of ground-nesting birds.
Afon Bargoed Taf (Merthyr Tydfil)	Candidate SINC	1.2km	The cSINC covers all sections of the Bargoed Taf and Nant Bargoed which do not fall in other cSINCs along the route. It includes adjacent bankside habitats, particularly semi-natural woodland (mostly dominated by alder) along with areas of semi-improved neutral grasslands, bracken slopes and swamp. Large mature trees are frequent along the banks, and these may support roosting bats. Otter occurs along the Bargoed Taf, which is also important for a range of birds of interest, including kingfisher, grey wagtail, dipper and spotted flycatcher. Great crested newt is recorded in the floodplain at Bryn Caerau.
Merthyr Common South (Merthyr Tydfil)	SINC	1.3km	A very extensive upland / semi-upland common comprising a mosaic of habitats including marshy grassland, acid grassland, wet heath, dry heath and bracken slopes. There are also areas of acid flush, broad-leaved woodland, dense and scattered gorse scrub, numerous ponds and streams (including a section of the Nant Bargoed), extensive outcrops of rock and some disused quarries and on old colliery spoil; largely re-vegetated with acid grasslands and heathlands, but calcareous influences also occur locally. The ponds support a rich dragonfly and damselfly fauna. The site is important for a range of ground-nesting birds, along with peregrine falcon on the high cliffs in the south.
Cwm Bargoed (Merthyr Tydfil)	SINC	1.4km	A very large and diverse system of semi-upland 'ffridd' (valleyside) and valley-bottom habitats associated with the Afon Bargoed Taf. Complex

Site Name and (County Borough)	Designation	Distance from Site	Description
			mosaic of semi-natural habitats including ancient semi-natural woodland, bracken slopes with scattered trees and scrub, marshy grassland, wet and dry heathland, acid grassland, swamp and acid flush. Several ponds are also present. The site supports small pearl-bordered fritillary and grayling butterflies, along with several scarce dragonfly and moth species. Otter ranges along the Bargod Taf, and the site is important for birds including cuckoo, pied flycatcher, wood warbler, whinchat and dipper.
Cwmlydrew Wood, south of Fochriw (Caerphilly)	SINC	1.6km	The site comprises the steep-sided valley of the Nant Hir stream, bordered by remnant ancient broad-leaved woodland, a small disused quarry and semi-improved acid grassland. The stream channel is only intermittently wet, but its rocky bed supports a range of bryophytes. Likely to provide opportunities for badgers and foraging and roosting bats. May support reptiles and uncommon species of bryophytes.
Mynydd Bedwellte (Blaenau Gwent)	SINC	1.6km	A large area of upland common land comprising acid grassland, mixed flushes, dry and wet heathland, marshy grassland, standing water and spoil. Overall the site is a rich mosaic of habitats of great value to a variety of wildlife.
Mile End Pond, Abertyswg (Caerphilly)	SINC	1.6km	A small, narrow wetland containing standing water with a diverse assemblage of wetland vegetation. The wetland has potential to support a high diversity of invertebrates, including dragonflies and has potential to support breeding wetland birds such as reed bunting.
Gelligaer Common (Merthyr Tydfil)	SINC	1.8km	A very extensive upland common comprising mainly unimproved acid grassland and grass-heath, with areas of dry heath and bracken slopes with scattered trees. There are also scattered marshy grasslands and acid flushes, which are often species-rich, and species-rich neutral and acid grassland, and small remnants of mature oak woodland. The site is important for birds including skylark, meadow pipit, red kite, peregrine falcon, yellowhammer, curlew and cuckoo. Several small ponds are present and support scarce blue-tailed damselfly.

Site Name and (County Borough)	Designation	Distance from Site	Description
Y Graig Mire, south of Abertyswg (Caerphilly)	SINC	1.8km	A site supporting heavily grazed semi-improved acid grassland, with areas of marshy grassland and drainage ditches fringed by flush vegetation including a high proportion of sedges and bryophytes. Alder and sessile oak border a small stream along the south eastern boundary. Some of the drier grassland areas support anthills. The site has potential to support uncommon species of bryophytes, breeding wetland birds such as reed bunting and populations of grassland fungi.
River Rhymney (Caerphilly)	SINC	1.9km	The site comprises the full length of the River Rhymney river corridor within the county borough and represents a significant linear wildlife corridor. The river valley is lined by trees along most of its length, and flows in a largely natural, rocky channel. Atlantic salmon, brown/sea trout, bullhead, grayling, common eel and otter have been recorded. Rock ledges and other areas along the river are important for rare bryophytes.
Troed-rhiw'r-fuwch, New Tredegar (Caerphilly)	SINC	1.9km	The site comprises a former quarry with rock exposures, scree, acid grassland, heathland, marshy grassland and wet woodland. The site is likely to support good populations of reptiles, provide roosting and foraging opportunities for bats and support waxcap fungi and uncommon bryophytes and lichens. The disused quarry has potential to support breeding peregrine and raven.
Parc Bryn Bach (Blaenau Gwent)	SINC	2km	The SINC is located within a Country Park and LNR and comprises a mosaic of semi-improved neutral, calcareous and acidic grassland, marshy grassland and post industrial land. Coniferous and broadleaved woodland has been planted and scrub, ponds and ditches, and a lake are present.

Vegetation and Habitats

- 8.45 Surveys of vegetation and habitats have been carried out. These have included a National Vegetation Classification (NVC) survey and Phase 1 habitat mapping, together with a survey of aquatic plants and grassland fungi. The principal NVC survey was carried out over the period July to October 2008, with an additional survey in July 2011. Phase 1 Habitat survey of areas not covered by the NVC survey was also carried out in October 2011. Reference has also been made to a Phase 1 Habitat Survey carried out at Nant Llesg by Humphries Rowell Associates in 1996 and to a Phase 1 Habitat Survey of the whole of Wales was carried out by the Countryside Council for Wales between 1979 and 1997. Account has also been taken of ecology surveys undertaken at Fochriw Tips in the south of the Nant Llesg site by Sturgess

Ecology for Caerphilly County Borough Council. The full reports of these surveys are included at Appendix MA/NL/ES/A08/002 and its appendices.

- 8.46 A Phase 1 Habitat Survey plan of the Nant Llesg site is provided in Drawing MA/NL/ES/08/003. The vegetation over much of the north of the Nant Llesg site comprises improved grassland on land previously subject to surface mining. In the centre and east of the site are extensive areas of semi-improved dry acid grasslands. These areas are of relatively low nature conservation value. However, to the south of Rhaslas Pond and extending to the south east the predominant vegetation is wet heath and mire. Wet dwarf shrub heath covers a large area in the central and southern part of the site. The plant communities here are the most sensitive and valuable within the site. There is also some mire vegetation in the north east of the site. Sheep tend to graze the drier grassland areas on mineral soils towards the north and east. However, there can be no guarantee that this more favourable grazing regime will continue in the long term and there are accordingly threats to the wet heath areas even in the absence of the proposed development. .
- 8.47 A survey of grassland fungi was carried out and identified 10 waxcap species and three clavarioids. No UK or local BAP species, or Provisional Red Data List species were recorded. On the basis of the survey, the site was assessed as being of local significance for grassland fungi. Effects on grassland fungi are assessed within the overall consideration of effects on unimproved grassland which is considered to be of County Borough importance.
- 8.48 Rhaslas Pond is a large water body in the centre west of the site and there are numerous small ponds, particularly in the west and south east of the site. Several minor watercourses drain the site.
- 8.49 The habitats identified on the site during the Phase 1 Habitat Survey included:
- Semi-natural broadleaved woodland
 - Mixed plantation
 - Coniferous plantation
 - Unimproved acid grassland
 - Semi-improved acid grassland
 - Poor semi-improved grassland
 - Improved grassland
 - Marshy grassland
 - Acid dry dwarf shrub heath
 - Wet dwarf shrub heath
 - Acid flush
 - Standing water
 - Running water
 - Natural inland cliff
 - Quarry

- Ephemeral/short perennial
- Dry ditch
- Intact, native species-rich hedge
- Intact species-poor hedge
- Defunct species-poor hedge
- Species-rich hedge and trees
- Species-poor hedge and trees
- Stone wall

Amphibians

- 8.50 A survey of 26 ponds within and in the vicinity of the site for great crested newt and other amphibians has been carried out with regard to best practice guidelines and recommendations published in the Great Crested Newt Mitigation Guidelines (English Nature, 2001a) and the Herpetofauna Workers Manual (Gent & Gibson, 2003). A plan showing the ponds and where newts were recorded is provided in Drawing MA/NL/ES/08/004. The full great crested newt survey report is included at Appendix MA/NL/ES/A08/003.
- 8.51 Each of the ponds was visited between mid-March and mid-June 2011, with two of these survey visits being between mid-April and mid-May. During each survey visit, at least three of four potential survey methods (namely bottle trapping, torch survey, netting and egg search) were undertaken. All surveys were carried out during appropriate weather conditions; when night-time air temperatures were greater than 5°C and there was no/little wind or rain.
- 8.52 One juvenile great crested newt was recorded and another possible adult great crested newt was seen. Caerphilly County Borough Council has reported the recording of an adult great crested newt near the reservoir adjacent to the Fochriw Road to the south of the site. Palmate newts were recorded in 20 of the 26 ponds surveyed. Although no smooth newts were positively identified, due to the fact that it can be difficult to distinguish the species from palmate newts by torchlight, it is considered that smooth newts might also have been present. Overall the findings of the survey indicate the presence of a small population of great crested newts and a large population of palmate and potentially smooth newts on site.

Reptiles

- 8.53 A survey of reptiles has been carried out in areas considered as most suitable habitat at the site, using professional judgement, in 2011. The reptile survey followed the recommended methodology outlined in the Herpetofauna Workers' Manual (JNCC, 2003) and Froglife's Advice Sheet 10 (1999). A plan showing where reptiles were recorded is provided in Drawing MA/NL/ES/08/004. The full reptile report is included at Appendix MA/NL/ES/A08/004.
- 8.54 Eighty six reptile refugia were placed in areas identified as providing the greatest suitability for reptiles and which had optimal basking opportunities in two areas of the site. The first area was in the centre and west of the site where a number of suitable features were present, including; south and west facing banks around Rhaslas Pond and along a dismantled railway; mounds around small ponds; and a low dry stone wall. The second area was located in the east of the site around a stream with south facing banks covered in rough grassland and scrub.
- 8.55 The refugia were left undisturbed for 20 days prior to the first survey visit being undertaken in order to allow them to bed down and to give time for reptiles to find them. In order to conform to best practice guidelines, seven survey visits were undertaken to inspect the refugia and a

visual search was undertaken when the refugia were being laid. The survey visits were undertaken during June with one visit in July.

- 8.56 One species of reptile; common lizard, was recorded in the study area and its population size class is categorised as 'good'. Common lizards were recorded during in areas of rough grassland and scattered rocks around a disused tip, a pond, the southern bank of Rhaslas Pond and a stone wall. These areas were more or less connected and common lizards are likely to move between them.

Bats

- 8.57 Bat surveys have been carried out in 2008 and 2011. A plan showing the areas identified as being of bat interest on the Nant Llesg site is provided in Drawing MA/NL/ES/08/004. The full bat report is included at Appendix MA/NL/ES/A08/005.
- 8.58 In 2008 two transects for bat activity survey were chosen for the site, using professional judgement. The two transects were visited twice (in July and September) during 2008. One species of bat was identified during the surveys – common pipistrelle. Two bat contacts were not identified to species due to poor sound quality. Feeding calls were also recorded. The line of broadleaved trees adjacent to the Heads of the Valleys industrial estate was a key foraging area for bats, and bats were also detected foraging and commuting in the vicinity of the reservoirs just beyond the site boundary at the south east and south west. Within the Nant Llesg site foraging and commuting activity was not restricted to linear features or waterbodies. A significant amount of foraging activity was detected within open environments adjacent to the Fochriw Road that forms the western boundary of the site, and within open environments around old iron workings and within marshy areas towards the west. There was also significant foraging activity around Rhaslas Pond, particularly on the western side. Although only one species was recorded, the level of foraging activity at the Nant Llesg site indicates that it is of value for bats in a local context.
- 8.59 An inspection of potential roosts was also carried out in 2008. The exposed cliff faces on site and the five disused concrete/brick structures adjacent to the site were examined for evidence of roosting bats and for roosting potential.
- 8.60 The exposed cliff faces were assessed as having low potential for summer and winter roosts. Three partially underground brick buildings may provide roosting opportunities for hibernating bats, but are unlikely to be suitable as important summer roosts. Two above-ground concrete structures provide low potential for summer roosts and low-medium potential as hibernation roosts.
- 8.61 The semi-mature trees on the eastern border of the site adjacent to the industrial estate were also examined, but were found not to have any potential for roosting bats due to their young age and lack of features such as holes, hollow limbs or cracked bark.
- 8.62 The daytime ground-based inspection was repeated in June 2011 to identify whether the roost potential of the structures had changed. Structures identified as having bat roost potential on site, including disused built structures and rock faces, were inspected. Each structure was inspected for features that may support a bat roost, such as cavities, cracks and splits in the rock faces and holes and gaps in the built structures which provided access to sheltered cavities and no change in roost potential was identified. Emergence surveys were carried out on two disused reservoirs as these were the structures identified as having greatest roost potential (low to medium) during the daytime inspection. The remaining structures had low suitability.
- 8.63 No bats were observed emerging from the structures during an evening emergence survey. Further automatic surveys undertaken near the structures identified high levels of activity within the surrounding woodland. Bats were recorded early in the evening which suggested they were roosting nearby but as no signs of use had been identified during the previous surveys it was considered unlikely that they had emerged from the disused reservoir structures. The eastern

- boundary of the site is close to the settlement of Rhymney and it is likely that suitable roost sites are present within buildings there.
- 8.64 The daytime roost inspection identified that the structures may be suitable as hibernation roosts. As the structures are outside the site boundary they are not likely to be directly affected by the proposals for the site.
- 8.65 Three evening bat activity surveys were carried out in 2011 in accordance with the Bat Surveys: Good Practice Guidelines (BCT, 2007). Three transect routes (two walked and one driven) were surveyed as part of each survey and these were devised to cover all of the habitat types found on the site and incorporated areas thought likely to be of most value, such as streams, ponds and woodland edge. Stationary automated surveys were also undertaken. ANABAT SD2 CF Bat Detectors were left overnight at remote locations on the site to gain additional information about bat activity in areas not covered by the transects.
- 8.66 Areas of open water, including Rhaslas Pond, a fishing pond just outside the south east corner of the site, and a number of smaller ponds, were identified as features of Medium bat interest. A high density of bat contacts were recorded in these areas and sustained foraging was recorded at times. High levels of activity were recorded during automatic surveys within an area of rough grassland in the centre of the site and around a woodland strip along the eastern boundary.
- 8.67 During some surveys, periods of very high levels of activity were recorded in the centre of the site. Feeding buzzes confirmed that bats were foraging in this area but it is also likely that bats were commuting to and from potential roost sites in Rhymney to the high value foraging sites around Rhaslas Pond and surrounding habitats.
- 8.68 Areas of Medium bat interest were also identified in the centre-west of the site and around parts of the southern and eastern boundaries. The remaining parts of the site were of overall Low bat interest.
- 8.69 At least four species of bat were recorded on the site; common pipistrelle was found to be abundant on the site and soprano pipistrelle and *Myotis* bats were recorded frequently. A noctule was recorded once.

Breeding Birds

- 8.70 An upland breeding bird species survey was undertaken during the period April to June 2011 using the Brown & Shepherd (1993) upland breeding waders method. The method was adapted, by undertaking three survey visits and by starting at, or within an hour of, dawn, in order to survey all species of open uplands or scrubby habitats.
- 8.71 A total of 61 species was recorded during the breeding bird survey, 37 species were confirmed to be breeding. Plans showing where notable breeding birds were recorded on the site is provided in Drawing MA/NL/ES/08/005. The full breeding bird report is included at Appendix MA/NL/ES/A08/006.
- 8.72 The most numerous breeding birds across the site were meadow pipit (104 territories) and skylark (97 territories).
- 8.73 None of the species confirmed breeding within the survey area is included on Annex 1 of the EU Birds Directive. One species confirmed as breeding (little ringed plover) is included on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).
- 8.74 Ten species confirmed breeding (ringed plover, lapwing, skylark, dunnoek, song thrush, starling, house sparrow, linnet, bullfinch and reed bunting) are included on the list of Species of Principal Importance prepared under Section 42 of the Natural Environment and Rural Communities Act 2006.

- 8.75 Eight species confirmed breeding (lapwing, skylark, dunnoek, song thrush, willow warbler, starling, house sparrow, linnet and bullfinch) are included on the UK and/or Welsh Birds of Conservation Concern (BoCC) Red Lists.
- 8.76 Fifteen species confirmed breeding (mallard, ringed plover, snipe, skylark, swallow, meadow pipit, grey wagtail, dunnoek, wheatear, song thrush, mistle thrush, willow warbler, house sparrow, bullfinch and reed bunting) are included on the UK and/or Welsh BoCC Amber Lists.
- 8.77 Nine species confirmed as breeding (lapwing, skylark, dunnoek, song thrush, starling, house sparrow, linnet, bullfinch and reed bunting) are priority species listed in the UK Biodiversity Action Plan (BAP) and seven (lapwing, skylark, song thrush, house sparrow, bullfinch, linnet and reed bunting) is also a priority species listed in the Biodiversity Action Plan for Caerphilly County Borough.
- 8.78 Lapwing and little ringed plover were present in numbers of importance at the Welsh geographical scale; and ringed plover and snipe were present in locally important numbers.
- 8.79 Red Kites were recorded on one of the survey visits and considered to be non-breeding immature birds from the local population. There was no evidence of nesting within the site. Since use of the site by Red Kites is only occasional and there is ample foraging habitat in the surrounding area, there is no likelihood of significant effects on the population and this species is not considered further.
- 8.80 Other species included in the BOCC Red or Amber Lists recorded occasionally in low numbers (typically on passage) but which did not breed on the site and for which the site is not likely to be of particular significance and thus are not considered further are golden plover, curlew, green sandpiper, sand martin and fieldfare.
- 8.81 The overall diversity of the breeding bird assemblage of the survey area is of Local importance.

Wintering Birds

- 8.82 Wintering bird surveys were carried out over the winter period in 2008/2009 and 2011/2012. A plan showing areas of particular value to wintering birds on the site is provided in Drawing MA/NL/ES/08/006. The full wintering bird reports are at Appendices MA/NL/ES/A08/007 and MA/NL/ES/A08/008.
- 8.83 The first survey extended from November 2008 to February 2009. The standard British Trust for Ornithology (BTO) method for recording wintering birds was used.
- 8.84 The winter bird assemblage recorded at the site in 2008/2009 was a mixture of common, lowland, wider-countryside or urban species such as wren, house sparrow, robin, buzzard, carrion crow, blue tit, rook, jackdaw, magpie and blackbird and more typical upland species such as meadow pipit, raven and stonechat. Several declining species often associated with lowlands such as skylark, song thrush and starling were also seen, many of which were also present in the areas of rougher grassland. Reed buntings were observed feeding in and around the tree planting belts and the allotments at Fochriw. Five specially protected species, seven UK BAP Priority species, five red-listed species of high conservation concern and sixteen amber-listed species of medium conservation concern were observed at Nant Llesg.
- 8.85 In addition to the species regularly seen during the surveys several rarer, more specialised species were also seen including peregrine falcon and short-eared owl.
- 8.86 No specially protected species were observed on Rhaslas Pond during the winter of 2008/9 but two UK BAP Priority species and eleven amber-listed species of conservation concern were observed.

- 8.87 The 2011/2012 surveys of wintering bird species were based on monthly 'walkover' surveys between October and March. A survey route was followed ensuring all parts of the site were visited to within approximately 100m and all species were recorded.
- 8.88 In 2011/2012 a total of 72 species were recorded during the wintering birds survey. Of these, 42 species meet at least one of a range of criteria relating to conservation importance.
- 8.89 Five species (hen harrier, merlin, lesser black-backed gull and herring gull may be present in numbers notable at a regional level (>1% of the Welsh wintering population). However, the records of hen harrier and merlin consisted of lone individuals located on single survey visits, hen harrier on 23rd November 2011 and Merlin on 27th January 2012. Both birds were seen foraging within the central section of the survey site. Three records of single hen harriers and a record of a single merlin were also included within the SEWBReC data. The infrequency at which these species were recorded suggests the survey area is not used by wintering hen harrier or merlin on an annual basis; and, when they are present, does not provide critical roosting or foraging habitat for these individuals but probably forms part of a larger winter feeding range. The site is thus assessed as being of community importance for these species.
- 8.90 The populations of lesser black-backed gull and herring gull are associated with the neighbouring Trecatti Landfill Site and are thus artificially maintained. Their use of the site is generally restricted to roosting on Rhaslas Pond. On this basis the site is assessed as being of community importance for these species.
- 8.91 Wigeon, tufted duck, goldeneye, goosander, red kite, jack snipe, snipe, short-eared owl and reed bunting may be present in numbers notable at a local level (>1% of the county population). The populations of these species are considered to be of County Borough importance.
- 8.92 The waterbirds recorded (including wigeon, tufted duck, goldeneye and goosander) were strongly associated with Rhaslas Pond on the western side of the survey site.
- 8.93 Snipe were recorded across much of the survey area; however, concentrations occurred to the south-east of Rhaslas Pond and in the south-east part of the survey area. Jack snipe were also recorded across the southern half of the survey area.
- 8.94 Reed buntings were recorded across the central and southern parts of the survey area
- 8.95 The diversity and abundance of species recorded during the 2011/2012 survey was similar to that previously found during 2008/2009. However, counts of lesser black-backed gull, herring gull and starling were significantly greater in 2011/2012 possibly as a result of changes in landfill activity at Trecatti adjacent to the west of the survey area.

Otter and Water Vole

- 8.96 There are previous records of otter from watercourses in the Nant Llesg area. There are no records of water vole in vicinity of the site. The full otter and water vole report is included at Appendix MA/NL/ES/A08/009. A plan showing where signs of otter were recorded in the survey area is provided in Drawing MA/NL/ES/08/004.
- 8.97 The otter survey was undertaken with regard to the methodology described in the *Design Manual for Roads and Bridges*, Volume 10 Section 1, Part 9 (Highways Agency 1999). This methodology was developed primarily for linear schemes which are likely to affect otter habitats or populations, but is considered useful in undertaking surveys relating to larger sites covering substantial areas as it allows for a clearer picture of potential otter use of the landscape on and around the site. It was modified to include survey of all stretches of watercourse directly affected by the scheme and inspection of accessible bridges over water-courses in the vicinity of the site.
- 8.98 The survey comprised three elements:

- A survey of all watercourses (ditches, streams and rivers) located within the site;
 - A spot check survey of watercourses at road and footbridge crossings in the vicinity of the site;
 - A consideration of likely routes to be used by otters while making use of their territories.
- 8.99 The water vole survey was based on the survey methodology described in Strachan and Moorhouse (2006). The survey was completed at the same time as the otter survey and covered the same survey areas.
- 8.100 The survey of watercourses and ponds on site was carried out on 4th and 5th July 2011 and was repeated updated on 8th to 11th October 2011, and again on 8th and 9th March 2012. A further survey was carried out on 16th January 2013.
- 8.101 The findings of the survey indicate that otters are active on some of the water bodies within the Nant Llesg site. The water bodies include Rhaslas Pond and water courses to the south of it, and Pond 10.
- 8.102 The survey of bridges did not provide any evidence of otter activity during 2011/12, but previous surveys of some of the same locations showed that in 2010 otters had been active on a number of watercourses, including the River Rhymney, Nant Bargoed Rhymney (and tributaries) and Nant Gyrawd. Fresh spraints were found at a bridge on the River Rhymney during the 2013 survey.
- 8.103 No evidence of otter resting sites, holts or laying up locations has been identified.
- 8.104 The pattern of otter activity detected has been interpreted as indicating that otters occasionally migrate along these water-courses for the purposes of foraging, but the limited resources available mean that these areas probably do not represent the core territory for any individuals, and are only used on an occasional basis.
- 8.105 Looking at the patterns of otter activity it appears that otter presence within the site generally comes from the south, rather than the north. It appears that otters are most likely to access the site via the Nant Bargoed Rhymney and River Rhymney. Known otter activity on water-courses further to the west, such as the Nant Gyrawd and Bargoed Taf may also contribute to the levels of activity on Nant Llesg.
- 8.106 No evidence for the presence of water voles has been found. The watercourses present are not ideal for water voles due to frequent fluctuations in water level and in some cases inappropriate bank conditions.

Badger

- 8.107 A badger survey was carried out in December 2011 and February 2012. The full badger report is included at Appendix MA/NL/ES/A08/010. .
- 8.108 The survey followed the methodology of the Highways Agency (2001a) and investigated potential badger habitats on site. The survey covered all areas of the site, in particular woodland edges, hedge lines, banks, fences and ditches. The site was walked and searched for badger setts and signs of badgers, such as droppings, latrine sites, diggings, footprints, hair, runs and trails. Where areas of scrub are dense and impenetrable, the perimeter would be searched for the presence of badger field signs.
- 8.109 No signs of badger activity were identified on the site. The lack of habitat suitable for badgers to create setts is probably the main reason for their absence. Much of the site is either too wet, or too rocky for badgers to excavate a well-drained and substantial sett although there are some areas of suitable habitat present.

- 8.110 Badger is a relatively mobile species, and if subjected to population pressure or unusual levels of disturbance, they are capable of moving into new areas. Therefore, the site should be resurveyed before any development activities began to ensure that no new populations of badgers have moved into the area and taken up residence. In the unlikely event that badgers were found to be present, the most likely location would be in the low lying eastern margin of the site. Should any badger sett be found to be present at that time, appropriate measures would need to be taken to protect or relocate the sett. This would be done under a licence from NRW in accordance with the Protection of Badgers Act 1992.
- 8.111 Given that badger is not currently present in the area of the site, no assessment of the effects of the Nant Llesg project on badger has been made.

Aquatic Invertebrates

- 8.112 A survey of aquatic invertebrates was carried out in November 2008 and May and October 2011. The full Aquatic Invertebrates Report is included at Appendix MA/NL/ES/A08/011.
- 8.113 In November 2008 samples were collected from 18 sites on a range of open waterbodies (ponds) and from eight sites on five streams within the site. The objective was to determine the nature conservation interest of the aquatic habitats, with emphasis on rare or notable macro-invertebrate species ahead of proposed mining activities. Identification was carried out to species level provided appropriate diagnostic features were available.
- 8.114 The survey was repeated in May 2011 and a further survey carried out in October 2011. None of the species recorded were of particular nature conservation significance.
- 8.115 For the purposes of description the ponds were described in four groups in the following parts of the study area: North east, Centre west, West, and South east. The full survey report at Appendix MA/NL/ES/A08/011 should be consulted for the detailed findings and a summary is as follows:

Centre-West of the Study Area

- 8.116 The area was dominated by Rhaslas Pond with smaller ponds linked to it. Habitat was depositing and macro-invertebrates were generally adapted to exploit the detritus and decomposing material associated with quiescent conditions. By Spring 2011, some species previously present were not recorded in Ponds 10 or 12. By autumn 2011 however, numbers had recovered which may reflect the dry Spring conditions and an associated decline in pond surface area and open water habitat in the earlier part of the year.
- 8.117 Rhaslas Pond supported few plants and therefore lacked many of the beetle and bug species that exploited vegetation within the smaller ponds. In 2008, the pollution-intolerant cased caddisfly (Great red sedge) was present but was not recorded in 2011. This species occurs throughout southern and central England and south Wales.

North-East of the Study Area

- 8.118 The macro-invertebrates of ponds in this area were adapted to exploit detritus and decomposing material associated with quiescent conditions and included molluscs, various haliplid and dytiscid beetles, as well as water boatmen, chironomid larvae and the water hog louse. In addition, various insects had established populations but none was of particular national or local conservation importance. These included the widespread and locally common hawker dragonfly, damsel flies (blue tailed damsel and red damsel) as well as Baetid mayflies and Leuctrid (needle or willow flies) stoneflies. By Spring 2011, species diversity had fallen. The dry weather in Spring 2011 caused the ponds to shrink in surface area thus restricting open water habitat which appears to have impacted on the macroinvertebrate community. Diversity within the macroinvertebrate community had not increased by Autumn 2011 and there was evidence of recent low water levels in the ponds and associated habitat loss.

8.119 The stream habitat in contrast, was generally firm, accessible and eroding (riffles) but with intermittent depositing regions (pools) and few plants. Many of the colonising macro-invertebrates thrive only in good quality water and were well adapted to rapid flows. Species that exploit detritus and decomposing material (leeches) and vegetation (bugs, beetles and many molluscs) were scarce. In Autumn 2008, the golden ringed dragonfly which is widely distributed but predominant in the north and west of England, occurred at all three stream sites but was not recorded in Spring 2011. The low Spring rainfall appears to have affected the stream community less than the pond community. Flows in 2011 were generally lower than in 2008 but there was no evidence that the streams had dried out.

West of the Study Area

8.120 Ponds and streams in this area lay inside the western boundary of the study area between the north-west corner of Rhaslas Pond and the south-west corner of the site.

8.121 In the ponds in the north-west of the area, fauna was limited and comprised species adapted to exploit the detritus and quiescent, decomposing conditions. Although few bugs and beetles were found in 2008, dytiscid and hydrophilid beetles were recorded in Ponds 5 and 6 in 2011. With this exception, the macroinvertebrate community had not changed markedly between 2008 and 2011.

8.122 Biotic indices at stream site (iv) which flowed north were much lower than at sites in the north-east of the study area and reflected a dearth of high-scoring pollution-intolerant stonefly, mayfly and caddisfly families. However, Leuctridae were present indicating good quality water and suggesting that flow might have been insufficient to sustain other high-scoring insects.

8.123 In both 2008 and 2011, ponds to the south of the area supported a more diverse fauna than those in the north-west although in both areas, the fauna was dominated by the molluscs, worms, crustacea, bugs and beetles that exploit detritus and decomposing material associated with quiescent conditions. In ponds in the south of the area Baetid may flies and damselfly and dragonfly species occurred. A range of bugs and various beetles associated with marginal and aquatic plants were also present. In 2011, Ponds 6 and 9 had been disturbed by the deposition of waste material and excavation spoil within their basins but the macroinvertebrate community was generally similar to that in 2008. By autumn 2011 Pond 9 had been destroyed by vehicle movements on the site but conditions in the other ponds had not changed markedly.

8.124 Biotic indices at stream site (v) were similar to those at site (iv) and lower than at sites in the north-east of the study area. Except for the absence of Leuctrid mayflies in Spring 2011, the macroinvertebrate community was similar to that found in 2008.

South-East of the Study Area

8.125 With the exception of Rhaslas Pond, Pond 18 was larger than other ponds in the study area and was stocked with coarse fish. It dominated the area. Two streams drained the area and flowed in a generally easterly direction. The pond habitat supported a limited fauna comprising macro-invertebrates adapted to exploit the detritus and decomposing material associated with quiescent conditions. In 2008, the pollution intolerant caddisfly *Phryganea grandis* was present suggesting that water quality was good. This species is known to favour slow-flowing environments such as ponds and canals but was not recorded in 2011.

8.126 The macroinvertebrate community at the stream sites was similar to those of streams to the west of Rhaslas Pond and much less diverse than at sites in the north-east of the study area. This reflected a lack dearth of high-scoring pollution-intolerant stonefly and mayfly families.

Terrestrial Invertebrates

8.127 A survey of terrestrial invertebrates has been carried out over the period June to October 2011 using a variety of techniques including direct observation, sweep netting, beating vegetation,

pitfall trapping, MV light trapping and actinic light trapping. The full Terrestrial Invertebrates Report is included at Appendix MA/NL/ES/A08/012.

- 8.128 A total of 177 invertebrate species were recorded. No invertebrate species that are afforded direct legal protection under any UK or European legislation were encountered. Small heath butterfly was recorded which is on the list of Species of Principal Importance prepared under Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006 and UK BAP Priority Species (UK Biodiversity Reporting and Information Group 2007). Four "Research Only" BAP moth species were recorded (dusky brocade, shoulder-striped wainscot, white ermine and the anomalous); several others are likely to be present. No species listed in the British Red Data Books (Shirt, 1987; Bratton, 1991) or which has been elevated to the status of Critically Endangered, Endangered, Nationally Vulnerable or Near Threatened (formerly Nationally Rare) by subsequent formal reviews was recorded. No species recorded feature in the Nationally Scarce (formerly Nationally Notable) categories. Three species listed as Nationally Local were recorded. These were a species of dor beetle, a hoverfly and the scarce silver-y moth).
- 8.129 In addition, supplemental recording of Lepidoptera was carried out during the dragonfly survey visits. A total of 21 species of Lepidoptera were recorded.
- 8.130 None of the Lepidoptera recorded were included on Schedule 5 of the Wildlife and Countryside Act. Three species (grayling, small heath and broom moth) are on the list of Species of Principal Importance (S42 NERC Act 2008) and UK BAP Priority Species; and one species (Grayling) is also a Locally Important Species (as identified by local specialists) in the SEWBReC area. Small heath and Wall butterflies were also recorded in surveys of Fochriw tips for Caerphilly CBC. Wall butterfly is also a Species of Principal Importance and UK BAP Priority Species.

Dragonflies

- 8.131 A survey of Odonata was carried out based on fortnightly transect visits carried out from the beginning of June to the end of September 2011. The full Odonata Report is included at Appendix MA/NL/ES/A08/013.
- 8.132 Information on Odonata recorded within 2km of the site was obtained from the South East Wales Biodiversity Records Centre (SEWBReC); and an Odonata survey was undertaken using a standardised transect method.
- 8.133 Fourteen species of Odonata were identified as occurring, or having occurred, within the Nant Llesg survey area boundary.
- 8.134 Of the species recorded within the survey area, none are included in Schedule 5 of the Wildlife and Countryside Act 1981; one (scarce blue-tailed damselfly) is a Red Data List Species; none are species on the list of Species of Principal Importance prepared under Section 42 of the Natural Environment and Rural Communities Act 2006 or UK BAP priority species (UK Biodiversity Reporting and Information Group 2007); and five are Locally Important Species (as identified by local specialists) in the SEWBReC area (emerald damselfly, scarce blue-tailed damselfly, golden-ringed dragonfly, keeled skimmer and black darter).
- 8.135 The greatest diversity and abundance of Odonata were found to occur in those parts of the survey area adjacent to Rhaslas Pond, between Rhaslas Pond and South Tunnel Road to the south, and to the south of the road.

Fish

- 8.136 A survey of fish in Rhaslas Pond and watercourses within the Nant Llesg site was carried out in October 2011. Rhaslas Pond was surveyed by Seine netting and electro-fishing and the watercourses by electro-fishing. The full fish report is included at Appendix MA/NL/ES/A08/014.

- 8.137 The surveys revealed that Rhaslas Pond supported a very low density, species poor fish community. Both the quantitative and qualitative techniques showed a simple piscivore dominated fish community, i.e. dominated by Perch with Pike, supported by cyprinids, Common Bream and Roach.
- 8.138 At the time of surveying, three of the eight streams within Nant Llesg were dry and the presence of terrestrial macrophytes in two streams suggests that these may have previously been dry or at least suffered reduced flows.
- 8.139 Fish were recorded in two streams. Brown Trout was recorded in a stream which ultimately connects to the River Rhymney and 3-spined sticklebacks were recorded in a stream which is the outflow of a fishing pond just beyond the south east of the site. The streams do not provide suitable spawning ground for brown trout.
- 8.140 Information on fish species in the River Rhymney itself is provided in the Environment Agency Wales report 'The Rhymney Catchment Abstraction Management Strategy Document' (EAW, 2006). This reports that:

"Improvements in water quality in recent years have allowed the return of salmon and sea trout to the River Rhymney. Both species occur mostly in the lower reaches below Machen, although sea trout have been recorded further upstream. Brown trout are present throughout the Rhymney catchment, although their distribution is patchy. The river is stocked for fishing purposes and has historically been stocked with juvenile salmon to boost the recovery of the salmon population. Self-sustaining populations of salmonids are now present. Some tributaries and reaches of the river comprise salmonid spawning and nursery areas.

Coarse fish, principally roach, chub and dace occur in the lower reaches of the Rhymney river, but their distribution has been restricted by the bed stabilisation weirs at Cwmlas. Following consultation with our Flood Defence Team and appraisal of options to assist fish migration at these weirs, alterations to some of the weirs were undertaken in October 2003. This has improved conditions for fish passage. Grayling are present from the tidal limit to the middle reaches. However, numbers are compromised by intermittent episodes of poor water quality. Eels are also present throughout the river and its tributaries.

The diversity of fish along the length of the Rhymney river is very good, because of this the catchment is a regionally important fishery. The quality of spawning ground and fish habitats are considered to be good."

- 8.141 The report also refers to discharges of minewater as follows:

"The closure of the last deep mines in the late 1980's and the cessation of pumping operations have resulted in a recovery of groundwater levels across much of the eastern part of the coalfield. This recovery has resulted in many groundwater emergences through mine shafts, drifts and drainage adits over the last 10 years. There are locations within the Rhymney catchment where orange minewater seepages can be seen flowing into the watercourses, in particular around the Cefn Hengoed area. It is not always possible to distinguish the mines from which these discharges originate, due to the interconnections between the different shaft systems."

and

"...Although these minewater discharges can cause water quality problems, they do benefit the volume of river flow as they maintain a fairly consistent discharge during the summer months. Without these, river flows would be lower."

- 8.142 Problems associated with mine water discharges to the River Rhymney in the vicinity of the Nant Llesg site are described in Chapter 10 Hydrogeology and Chapter 11 Hydrology and Drainage. In summary, whilst a variety of broader water quality indicators are generally good around the Nant Llesg site, the water quality is impacted by the area's historic mining/industrial

legacy, with elevated levels of iron and other metals being recorded. A key influence on water quality is the discharge of untreated minewater, which is particularly high in iron and manganese, into the River Rhymney from the Bute Level (a minewater drainage system). This discharge occurs towards the southern end of the Rhymney culvert at Pontllytyn and is responsible for the current severe orange ochre staining of the river bed in this area.

8.143 The impacts of discharges of minewater from abandoned mines are described in the Environment Agency report 'Abandoned mines and the water environment' (EA, 2008). The report explains that the effects on aquatic communities may not be immediately obvious, but can have serious environmental consequences which include:

- reduced numbers and diversity of invertebrates;
- fish mortalities, particularly of sensitive salmonid species;
- loss of spawning gravels for fish reproduction and nursery streams; and
- a reduction in numbers and biodiversity in the river corridor.

8.144 The report explains that:

"The ochre deposited by iron-rich minewaters can decimate freshwater ecology by smothering the river bed with iron hydroxides. Natural game fish populations - salmon, sea trout and trout - are particularly susceptible to such pollution as they need open, well-aerated gravels to lay their eggs in.

Low-pH waters can be directly toxic, causing damage to fish gills. Acidic conditions can also increase the solubility and toxicity of metals such as aluminium, copper, lead, zinc and cadmium.

In some areas, particularly upland streams, the natural fish and invertebrate populations are greatly reduced because of minewater pollution. These streams are important as fish-breeding grounds and nursery areas for developing juveniles. The loss of these areas is a major cause of the decline in fish populations which has been demonstrated in some locations. Any changes in the river's ecology can have a knock on effect on the river corridor as a whole, since riverine birds and mammals such as dippers and otters may be unable to feed sufficiently."

8.145 Chapter 11 of this ES also reports that the Environment Agency Wales (now Natural Resources Wales) Water Framework Directive (WFD) classifications indicate that for the River Rhymney, Nant Bargod Rhymni and Nant Bargod Taf in the area of the site, classifications for all but one parameter are all relatively high, indicating good quality watercourses. Macrophytes, invertebrates, phosphate, DO, pH, Ammonia, WFD Annex 8 substances, morphology and hydrology are all consistently classified as 'Good' or 'High' (although this classification is for the whole watercourse length, hiding the effects of the severe physical modification to the watercourse associated with the Rhymney culvert). The only low scoring parameter for all three watercourses is fish, which is indicated as 'Poor'. This indicates that the fish present in these watercourses compare poorly with what would be expected in a typical un-impacted reference reach. Poor channel structure, siltation from sediment inputs from adjacent land use, in channel obstructions (i.e. weirs) and poor water quality are the most common reasons for poor fish scores.

8.146 Chapter 10 Hydrogeology refers to Coal Authority data which is useful in characterising the effect of the discharge from the Bute Watercourse and the associated Dowlais Free Drainage System on water quality in the River Rhymney and the decline in water quality between the Rhymney and Pontllytyn Bridges. The Coal Authority has advised that the Environment Agency (now NRW) have assessed that the Pontllytyn discharge is the second worst impacting coal mine water discharge in Wales which has not yet been remediated. On average it affects a length of some 3km of the river (although this may vary from time to time). The Coal Authority has investigated this discharge and considers at the present time that remediation is

probably infeasible mainly due to health and safety concerns of entering the river culvert to capture and transfer the water.

- 8.147 Chapter 11 also refers to the Severn River Basin Management Plan (RBMP) (EA, 2009), of which the Nant Llesg Site is situated in the South East Valleys sub-district. The Nant Llesg site falls within the RBMP surface water body known as: "Rhymney R - source to confluence with Nant Bargod Rhymni". This water body currently has reported moderate ecological status due to the reduced health of the River Rhymney's fish stocks. The WFD Ecological Objective is for this water body to achieve good ecological status by 2015.

Valued Ecological Receptors

- 8.148 Valued Ecological Receptors (VERs) comprising sites, habitats and species which could be affected by the project and which are of particular nature conservation interest or concern are identified in Table 8.4 below. With respect to statutory designated sites, since many of these are distant from the site, and the only potential for significant effects on the features for which the sites are designated arises from potential changes in air quality, only those sites within 2km of the site are listed. Beyond this distance there is no possibility of adverse impacts on the integrity of statutory designated sites. However, the four SACs for which CCW have requested that Habitats Regulations Assessment be provided have been considered, notwithstanding their distance from the site. These are the Aberbargoed Grasslands SAC, Usk Bat Sites SAC, Cwm Cadlan SAC and Blaen Cynon SAC. For species the value is based on the level of importance of the site for the species, not the conservation status of the species.

Table 8.4 Valued Ecological Receptors

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
<i>Statutory Designated Sites (10km radius)</i>		
Aberbargoed Grasslands	SAC (and component SSSI) (7.9km)	International
Usk Bat Sites/ Safleodd Ystlumod Wysg & Mynydd Llangatwg (Mynydd Llangattock)	SAC (and component SSSIs) (8.0km)	International
Cwm Cadlan SAC	SAC (and component SSSI) (>10km)	International
Blaen Cynon SAC	SAC (and component SSSI) (>10km)	International
Parc Brynbach	Country Park (and part LNR) (0.5km)	County Borough
Parc Cwm Darran & Cwmllywdrew	Country Park (and part	County Borough

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
Meadows	LNR) (1km)	
<i>Non-Statutory Designated Sites (2km radius)</i>		
Cefn Gelligaer, West of Deri	Site of Importance for Nature Conservation (within site)	County Borough
Tair Carreg Moor, North West of Fochriw	Site of Importance for Nature Conservation (10m)	County Borough
Butetown, Llechryd and Rhymney Grasslands	Site of Importance for Nature Conservation (50m)	County Borough
Nant Bargod Rhymni, Darran Valley	Site of Importance for Nature Conservation (0.2km)	County Borough
Nant Bargod Flush, Deri	Site of Importance for Nature Conservation (0.3km)	County Borough
Cwm Golau	Site of Importance for Nature Conservation (0.4km)	County Borough
Cefn y Brithdir, south of Pontlottyn	Site of Importance for Nature Conservation (0.4km)	County Borough
Pen March and Traed y Milwyr, Llechryd	Site of Importance for Nature Conservation (0.5km)	County Borough
Blaenmorlais	Site of Importance for Nature Conservation (1km)	County Borough

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
Afon Bargoed Taf	Site of Importance for Nature Conservation (1.2km)	County Borough
Merthyr Common South	Site of Importance for Nature Conservation (1.3km)	County Borough
Cwm Bargoed	Site of Importance for Nature Conservation (1.4km)	County Borough
Cwmlludrew Wood, south of Fochriw	Site of Importance for Nature Conservation (1.6km)	County Borough
Mynydd Bedwellte	Site of Importance for Nature Conservation (1.6km)	County Borough
Mile End Pond, Abertysswg	Site of Importance for Nature Conservation (1.6km)	County Borough
Gelligaer Common	Site of Importance for Nature Conservation (1.8km)	County Borough
Y Graig Mire, south of Abertysswg	Site of Importance for Nature Conservation (1.8km)	County Borough
River Rhymney	Site of Importance for Nature Conservation (1.9km)	County Borough
Troed-rhiw'r-fuwch, New Tredegar	Site of Importance for Nature Conservation (1.9km)	County Borough
<i>Habitats recorded within the Nant Llesg site</i>		

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
Acid dry dwarf shrub heath	HD Annex 1 NERC S42 UK BAP Priority (Upland Heathland) Caerphilly BAP	County Borough
Wet dwarf shrub heath	HD Annex 1 NERC S42 UK BAP Priority (Lowland Heath) Caerphilly BAP	County Borough
Wet heath/acid grassland mosaic	NERC S42 UK Priority BAP (lowland)	County Borough
Acid flush	NERC S42 UK BAP Priority	County Borough
Basic flush	NERC S42 UK BAP Priority	County Borough
Rivers and streams (running water)	UK Priority BAP NERC S42 Caerphilly BAP	Community
Ponds (standing water)	NERC S42 UK BAP Priority (Ponds) Caerphilly BAP	County Borough

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
Lakes and reservoirs (standing water)	Caerphilly BAP	County Borough
Hedgerows	NERC S42 UK BAP Priority (Ponds) Caerphilly BAP (species-rich)	Community
Unimproved acid grassland	NERC S42 UK BAP Priority (lowland acidic grassland) Caerphilly BAP	County Borough
Semi-improved acid grassland		Community
Poor semi-improved grassland		Community
Improved grassland		Community
Marshy grassland (includes Purple moor-grass marsh)	NERC S42 UK BAP Priority Caerphilly BAP (Rhos pasture)	County Borough
Inland Rock Outcrop and Scree Habitat (natural inland cliff and quarry)	NERC S42 UK BAP Priority Caerphilly BAP (Quarry)	Community
Dry ditch		Community
Semi-natural broadleaved	NERC S42	Community

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
woodland	UK BAP Priority	
Mixed plantation		Community
Coniferous plantation	Caerphilly BAP	Community
Stone walls	Caerphilly BAP	Community
Scattered Scrub		Community
Naturally Revegetated Colliery Spoil (ephemeral/short perennial vegetation)	Caerphilly BAP	Community
Introduced shrub		Community
<i>Species recorded within the Nant Llesg site</i>		
Great crested newt	HR S2 WCA S5 NERC S42 UK BAP Priority Caerphilly BAP	County Borough
Other amphibians: Palmate newt Common frog Common toad	WCA S5 (partial) NERC S42 (Common toad) UK BAP Priority (Common toad) Caerphilly BAP	County Borough

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
Common lizard	WCA S5 (partial) NERC S42 UK BAP Priority Caerphilly BAP	Community
Bats: Common pipistrelle Soprano pipistrelle Noctule Myotis sp	HR S2 WCA S5 NERC S42 UK BAP Priority (not Common pipistrelle) Caerphilly BAP	Community
Otter	HR S2 WCA S5 NERC S42 UK BAP Priority Caerphilly BAP	Community
<i>Breeding Birds</i>		
Little ringed plover	WCA Schedule 1	Welsh (national)
Lapwing	NERC S42 UK BAP Priority Red list Caerphilly BAP	Welsh (national) and part of nationally important Heads of the Valleys metapopulation.

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
Ringed plover	NERC S42 Amber list	County Borough
Snipe	Amber list	County Borough
Skylark Spotted flycatcher Linnet House Sparrow Song Thrush	NERC S42 UK BAP Priority Red list Caerphilly BAP (Skylark, Linnet)	Community
Starling	NERC S42 UK BAP Priority Red list	Community
Dunnock Reed bunting Bullfinch	NERC S42 UK BAP Priority Amber list Caerphilly BAP (Reed bunting)	Community
<i>Wintering/Passage Birds</i>		
Hen Harrier	BD Schedule 1 WCA Schedule 1	County Borough

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
	NERC S42 Red list	
Merlin	WCA Schedule 1 BD Schedule 1 Amber list	County Borough
Short-eared Owl	BD Schedule 1 Amber List	County Borough
Common Goldeneye	WCA Schedule 1 Amber List	County Borough
Common Greenshank	WCA Schedule 1	County Borough
Common Kestrel	NERC S42 Amber List, Caerphilly BAP	Community
Common Pochard	Red ListWBR(RSPB), UKBAm(RSPB)	Community
Willow warbler Mallard Sand martin Meadow pipit Whinchat Wheatear Snipe Swallow	Amber list	Community

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
Grey wagtail Mistle thrush Northern Shoveler Eurasian Teal Great Cormorant Lesser Black-backed Gull Greylag Goose Great Black-backed Gull Eurasian Wigeon		
<i>Invertebrates</i>		
Small heath Grayling Broom Moth	UKBAP S42 NERC Locally Important Species (Grayling)	County borough
Dusky brocade Shoulder-striped wainscot White ermine The Anomalous	UKBAP (research only) NERC S42	Community
Scarce Blue-tailed Damselfly;	(Red data list species – Near Threatened)	County Borough

Ecological Receptor	Status (and distance from Nant Llesg site)	Geographical level of value
Other Odonata Including: Emerald Damselfly; Golden-ringed Dragonfly; Keeled Skimmer; Black Darter.	Locally Important Species)	County Borough
A dor beetle (<i>Geotrupes stercorosus</i>) A hoverfly (<i>Sphaerophoria taeniata</i>) Scarce silver-y moth	Nationally Local	Community
Aquatic invertebrates	No species of nature conservation importance	Community
Fish		
Brown Trout	UKBAP S42 NERC	Community

Policy Context

8.149 Only a brief policy overview is provided in this chapter together with an identification of the main policies of relevance. The planning policy context for the determination of the planning application is set out in full in the Planning Statement.

Welsh National Policy

8.150 National land use planning policy in Wales is set out in the fifth edition of 'Planning Policy Wales' published in November 2012 (PPW5). Chapter 5 of PPW5 is concerned with Conserving and Improving Natural Heritage and the Coast.

8.151 PPW5 is supplemented by Technical Advice Notes (TANs), in particular in the context of this chapter, TAN 5: Nature Conservation and Planning (Welsh Assembly Government, 2009a) which provides guidance about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation.

- 8.152 Minerals Technical Advice Note 2 (MTAN 2) (Welsh Assembly Government, 2009b) January 2009 sets out detailed guidance on the mechanisms for delivering the policy for coal extraction through surface and underground working.
- 8.153 It states that operations must meet international responsibilities, conserve statutorily designated sites and protect biodiversity and protected species in line with Planning Policy Wales.

Local Policy

- 8.154 The adopted Caerphilly County Borough Council Local Development Plan 2011 - 2021 (November 2010) sets out the council's land use policies and proposals to control development in the county borough up to 2021. It contains a number of policies designed to protect ecological assets and nature conservation including Strategic Policy SP10 (Conservation of Natural Heritage), County Wide Policies CW4 (Natural Heritage Protection) and CW6 (Trees, Woodland and Hedgerow Protection) and Area Specific Policy NH3 (Sites of Importance for Nature Conservation).

Biodiversity Action Plans

- 8.155 The UK's commitments as a signatory to the 1992 Biodiversity Convention are set out in Biodiversity: the UK Action Plan (1994). The UK Biodiversity Steering Group report was published in 1995 and included action plans for 116 of the UK's most threatened and endangered species and for 14 key habitats. Further species and habitat action plans have subsequently been published. At a local level Local Biodiversity Action Plans have been developed which are linked to national priorities.
- 8.156 The Wales Biodiversity Partnership has published The Wales Biodiversity Framework. This explains the roles, remits and processes essential to biodiversity conservation and enhancement in Wales. It provides a common point of reference on biodiversity for all organisations and individuals in Wales.
- 8.157 The Caerphilly Biodiversity Action Plan (BAP) includes a number of habitat and species action plans which are relevant to the proposed Nant Llesg development. Habitats and species included in the Caerphilly BAP and which were recorded within the Nant Llesg site are indicated in Table 8.4. In developing the proposals for restoration of the Nant Llesg site, the need to restore these habitats, and the requirements of these species, which include most of the specially protected species present, have been taken into account.

Data Limitations

- 8.158 The late start date for the Odonata survey and lack of counts in August means that there is a possibility that a small number of species may not have been detected and the maximum and mean counts recorded may have been negatively affected. In addition, whilst this is an efficient method for recording the majority of Odonata species, it should be noted that this method is not ideal for accurately recording species occurring in highly localised colonies which may occur away from the transect route, e.g. Variable Damselfly. Both the above limitations in the survey as conducted are offset by reference to the data as supplied by SEWBReC. The availability of this additional data should ensure that no species which may be present on site are omitted from this assessment.
- 8.159 The terrestrial invertebrate survey has potential to be affected to a degree by the generally unfavourable weather conditions prevalent during 2011. However, the surveyors consider that the survey results are fully representative of the species assemblage that was evident on the site during the year of the survey.
- 8.160 During the winter bird survey period, drilling operations were being carried out in the north and central parts of the survey area. It is likely that the drilling caused significant, though relatively

short-term, disturbance at the drilling location and to adjacent areas of habitat; and associated activity (e.g. regularly used vehicle access routes and parking areas) caused significant, and more protracted, disturbance to adjacent areas of habitat. A number of scheduled survey visits coincided with periods of heavy precipitation or reduced visibility due to mist. Where possible surveys were rescheduled. However, a small proportion of survey visits were undertaken under these conditions.

Seasonal Temporal Change

- 8.161 Seasonal temporal change is an important consideration in the planning and carrying out of ecological surveys and it is important that surveys are carried out at the appropriate time of year to ensure that the changes which occur in the ecology of the site throughout the year are recorded.
- 8.162 Whilst habitat surveys can be carried out at any time of year, they are best carried out during the spring and summer when the majority of plant species are visible. The behaviour of some animal species means that surveys can only be carried out at specific seasons. For example surveys for great crested newt can only be carried out during the period April to June when they are in their breeding ponds and can be readily found. At other times of year they are dispersed away from the ponds in terrestrial habitat and are very difficult to locate. Similarly breeding bird surveys can only be carried out over the period April to June when the majority of species are nesting.
- 8.163 Other surveys are best carried out in winter. For example badger surveys are best carried out when there is little vegetation to obscure the entrances to their setts, their latrines and other signs. Winter bird surveys must be carried out over the period November to February when wintering species are present.
- 8.164 All the surveys carried out to inform the baseline for the assessment of ecological effects have been carried out at the appropriate time of year.

Assessment Criteria

- 8.165 The assessment of effects takes into account any measures to avoid or reduce the effect, which are integral to the design of the project and which will be secured as part of the proposal. Any further mitigation or compensation recommended but not forming part of the design at this stage is identified but is not taken into account in the assessment of significance of effects.
- 8.166 An indication of the confidence with which predictions of potential effects are made has been given.
- 8.167 The magnitude of the predicted effects on the relevant features is assessed as indicated in Table 8.5

Table 8.5 Criteria for Determining the Magnitude of Effects

Magnitude	Criteria
High	The proposal is likely to affect the conservation status of the site or feature.
Medium	The site or feature's conservation status would not be affected, but the effect is likely to be significant in terms of ecological objectives or populations.
Low	Neither of the above apply, but some minor impact is likely.
Negligible	No observable impact.

8.168 In each case (other than negligible) the effect may be adverse or beneficial.

8.169 Conservation status is defined by the Institute of Ecology and Environmental Management (2006) as follows:

Habitats – ‘conservation status is determined by the sum of the influences acting on the habitat and its typical species, that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area’; and

Species – ‘conservation status is determined by the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area’.

8.170 The decision as to whether the favourable conservation status of an ecological receptor is likely to be compromised has been made using professional judgement based on an analysis of the predicted effects of the project.

8.171 For statutory designated sites that are affected by the project, the focus is on the effects on the integrity of the site, defined as ‘the coherence of ecological structure and function, across a site's whole area, that enable it to sustain the habitat, complex of habitats and/or levels of populations of species for which it was classified.’ This assessment has been made with reference to the features for which a site has been classified/notified and considers the effects on the favourable conservation status of each of these features.

8.172 For non-statutory sites, such features may not have been formally defined, but the main interest features have been identified from the site description.

8.173 A positive effect is considered to be significant if project activities cause:

- A non-valued ecological receptor to become valued;
- Restoration of favourable conservation status for a habitat/species population; and/or
- Restoration of a site's integrity (where this has been undermined).

8.174 Assessment of the magnitude of impacts takes into account the impact duration, for which the following definitions are used:

- Temporary - Short Term: A period of months, up to one year;
- Temporary - Medium Term: A period of more than one year, up to five years;
- Temporary - Long Term: A period of between five and twenty five years;
- Permanent: Longer than twenty five years.

Assessment of Significance

8.175 The significance of effects has been assessed on the basis of the value of the features and the magnitude of effects as set out in Table 8.6, taking into account professional judgement.

Table 8.6 Estimating the Significance of Effects

Nature conservation value of features affected	Magnitude of impact			
	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>Negligible</i>
<i>International (Very High)</i>	Major	Major	Moderate or Minor	Negligible
<i>National (High)</i>	Major	Major or Moderate	Moderate or Minor	Negligible
<i>County Borough (Medium)</i>	Moderate	Moderate	Minor	Negligible
<i>Community (Low)</i>	Minor	Minor	Minor or Negligible	Negligible

8.176 In broad terms the significance of effects set out in Table 8.6 relates to the decision making process as follows:

- **Major:** These effects constitute very important considerations and are likely to be material in the decision-making process.
- **Moderate:** These effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
- **Minor:** These effects may be of local importance. They are unlikely to be critical in the decision-making process.
- **Negligible:** No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Key Parameters for Assessment

- 8.177 The assessment of ecological effects is based on the Site Layout plan at Drawing MA/NL/PA/003 of this ES and the operational Method Statement referred to below. Consideration of the ecological characteristics of the site following restoration is based on the Restoration Strategy at Drawing MA/NL/ES/016/12-2.
- 8.178 Areas at the east and west margins of the site would be subject to localised remediation work during the first two years of operation of the site, including some ecological enhancements, for example to accommodate reptiles and great crested newts which may be displaced from the operational area. Since the disturbance in these marginal areas will be localised, and disturbance will be short term with appropriate aftercare much of the existing vegetation would be retained. The same is true of the area of Fochriw Tip in the south of the site which would only be subject to work required to alleviate the current problems of erosion of the tipped material.
- 8.179 However, in calculating the extent of habitat loss it has been assumed that all vegetation within the planning application boundary would be lost. This is thus very much a worst case assumption, and the actual extent of vegetation loss will be somewhat less.

Site Operations

- 8.180 The method of working the site is set out in Miller Argent's Method Statement for the Nant Llesg site (see Chapter 3 The Nant Llesg Project). The key elements of the working of the scheme are summarised here. The extent of the operational areas of the site, in particular the open cast void and the overburden stores, with the associated facilities, are shown on Site Layout plan at Drawing MA/NL/PA/003. The site would be worked in a west to east direction. The phasing of the working site is shown on Disposition Drawings 1 to 5 (Drawings MA/NL/PA/004-008). These show the progressive nature of the coaling operations and restoration of the site. The stages of the operation (with timescale based on a maximum annual rate of coal production of 750,000 tonnes per year) would be:

- Disposition 1 Development of Box Cut and Land Remediation (0 to 4 years);
- Disposition 2 Development of Maximum Void and creation of Overburden Mound (4 to 6 years);
- Disposition 3 Maximum Void to Start of Backfilling of Overburden from the Overburden Mound (6 to 9.5 years);
- Disposition 4 End of Coaling (9.5 to 11 years); and
- Disposition 5 Backfilling and Restoration works to achieve the finished landform after coaling (11 to 14 years).

- 8.181 Progressive backfilling of the void would commence on completion of the box-cut and continue throughout the period of coaling. Final overburden replacement and the spreading of soils and/or soil-forming materials would take place as each stage of the progressive backfilling operations is completed. The advancing backfilled area would be progressively restored to provide the landform, micro-topography and landscape features of the approved restoration design. Aftercare of each area of the progressively restored land would continue for a minimum of 5 years after the completion of final restoration on that area.
- 8.182 The proposed surfacing mining operations would be carried out by large mechanical excavators and dump trucks with attendant ancillary plant. Coal seams would be cleaned using 25 - 35t excavators and loaded into Articulated Dump Trucks (ADT) and transported to an on-site coal transfer pad. Coal would then be re-loaded at this point into road going coal lorries. These would transport the coal, via on-site vehicle cleaning facilities, onto the public highway and to the Cwmbargoed Disposal Point (CDP). All overburden handling, coaling and ancillary

equipment used on Nant Llesg would be the same or similar as used on the adjacent Ffos y Fran Land Reclamation Scheme.

- 8.183 In addition to the coal mining operations of the Nant Llesg site, in the first two years of the operations remedial works to improve safety would be carried out on mine shafts and adits in the eastern part of the site, and drainage improvements would be implemented to reduce erosion of Fochriw Tip in the south west of the site.

Site Clearance

- 8.184 In addition to clearing stock and any removable apparatus or chattels from areas of land that are to be disturbed, the Method Statement explains that the land would be first cleared of protected species and nesting birds as far as is practicable.
- 8.185 Species listed in Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations) would be captured and removed to suitable receptor sites. All works would be carried out in accordance licences to disturb such species granted by NRW.
- 8.186 In order to avoid destruction of birds' nests, which are protected by law, it is normal industry practice to clear vegetation which may hold birds' nests outside the period March to August inclusive. In the case of the proposed operations, many of the bird species present are ground nesting, and clearance of vegetation would largely be through stripping of soils. Given the nature of the soils at the site and the climatic conditions, it would generally not be practicable to begin soil stripping before March. In order to avoid destruction of nests, birds would be actively deterred from nesting in areas where soils are to be stripped, or which are otherwise to be affected by operations by appropriate measures during March and April. Such measures are typically employed in advance of similar operations.

Land Take

- 8.187 For the purposes of the assessment, the land take of the scheme as a result of site enabling works and the clearance and the working of the site through Dispositions 1 to 4 are considered first. In practice a high proportion of this land take would take place in the early stages of working within site enabling works and Disposition 1 of the scheme as a result of clearing and stripping the land required for the soil and overburden stores, and the land required for the initial box cut, as well as the areas for the site offices, workshops and other facilities. The remaining land take would take place in small increments as Dispositions 2 to 4 progressed.
- 8.188 Since most of the land take occurs in the early stages of the scheme there is little to be gained from assessment of the effects of the land take for site enabling works and Dispositions 1 to 4 separately, and thus the effects of the overall land take are assessed together.

Operational Effects

- 8.189 The operational effects of the mining operation are assessed next. These are the additional effects, over and above the effects of the land take, and include effects arising from the activity on site such as noise generated by site activities, disturbance of wildlife as a result of vehicle and pedestrian movements, risk of spills or leaks of fuel, oil, and chemicals, pollution as a result of site drainage; and dust deposition on vegetation. These effects would occur throughout Dispositions 1 to 5 of the scheme. They are assessed against the impact of land take, rather than against the baseline and are intended to show the additional effects of activity, in addition to the effects of land take. This is the logical approach to assessment of these effects since they would only occur if the land take for the scheme took place so it is not reasonable or practical to assess them against the existing baseline.

Restoration

- 8.190 Restoration of the site takes place in Disposition 5. The restoration strategy for the site is illustrated on Drawing MA/NL/ES/016/012-2. This shows in conceptual terms the main land

uses and features proposed for the restored site. The restoration strategy would be subject to detailed approval by the Planning Authority at the appropriate time; detailed restoration proposals being agreed in advance of the various restoration stages.

- 8.191 The restoration strategy takes account of the habitats and species currently present within the site, and seek to re-establish topographical, soil and drainage conditions which will support these habitats and species. In particular habitats and species included in the Caerphilly BAP have been taken into account. Thus the restoration strategy includes specific measures to reinstate wet dwarf shrub heath in the area south of Rhaslas Pond. New ponds would be created by modifying the water treatment areas, and elsewhere, and watercourses would be established as part of the drainage of the restored site. A network of hedgerows would be established within the farmland area in the north of site, with new woodland areas here and in the east of the site. The restored site would provide habitat for Caerphilly BAP species such as great crested newt and other amphibians, common lizard, bats, otter, lapwing and a range of other breeding and wintering birds. This would include reinstatement of bare marginal areas at Rhaslas Pond suitable for little ringed plover.
- 8.192 The progressive restoration of the working areas would be followed by a programme of maintenance and aftercare for a minimum period of 5 years following completion of each stage of the restoration works. Particular attention would be paid to grazing control, appropriate fertilizer application, soil structure development and drainage necessary to achieve the standards of agricultural land, nature conservation and woodland restoration required by the local planning authority. Particular attention would be paid to the establishment and diversification of the natural and semi-natural vegetation types proposed in the wetland, woodland, pond margin and other conservation areas, and the establishment of favourable grazing areas to encourage grazing away from reinstated wet heath habitats.
- 8.193 The Restoration Strategy is described further below. The assessment of the effects of restoration include the aftercare proposals and is a comparison of the ecological characteristics of the restored landform and vegetation once aftercare is completed against the baseline situation before the commencement of the scheme.

Environmental Management

- 8.194 An Environmental Management Plan would be prepared and implemented for the Nant Llesg operations. This would include the requirements for mitigation of ecological impacts. The plan would form an integral part of the management of the operations. All site personnel would be made familiar with the ecological requirements of the works at induction courses and tool-box talks, as necessary.
- 8.195 Where necessary, site works would be monitored by an ecologist to ensure that the ecological requirements are fulfilled.
- 8.196 The working plan would ensure that works undertaken utilise only the minimum area and time, and that precautions were taken to avoid damage to habitats or features of ecological significance.
- 8.197 Planning and supervision of operations would seek to ensure that disturbance to existing undisturbed habitats and species, whether protected, of conservation concern, or undesignated, was kept to a minimum. Future site maintenance would also have due regard to the well-being of habitats, flora and fauna.

Identification of Potential Impacts and Mitigation

- 8.198 Direct land-take associated with development of the mine, including clearance of vegetation and stripping of soils, creation of the void and the overburden mound, and construction of buildings and other facilities ancillary to the mine, would result in loss of wildlife habitats. Sensitive species may be displaced. There is also the potential for indirect ecological effects as a result of the proposals.

8.199 Potential adverse ecological impacts during the operation of the mine include:

- Noise generated by site activities, including blasting, may cause disturbance or displacement of sensitive species;
- Disturbance of wildlife as a result of vehicle and pedestrian movements within and accessing the site;
- Disturbance of wildlife as a result of pedestrians accessing the site;
- Risk of spills or leaks of fuel, oil, and chemicals;
- Pollution as a result of site drainage; and
- Dust deposition on vegetation

8.200 There are opportunities for mitigation of these adverse ecological effects through control of working methods and on restoration of the site, through sensitive landscape design and habitat creation. Where this has been achieved this is taken into account in the assessment of effects. Such measures are summarised below.

8.201 As explained in Chapter 11 of this Environmental Statement, measures would be taken to ensure that no significant pollution of watercourses occurred as a result of site operations. Such measures would be designed and implemented to the satisfaction of Natural Resources Wales and would be regulated by them. Appropriate monitoring would be carried out to ensure effectiveness.

12.1 Dust generation as a result of the operations, and the measures to be taken to suppress such generation are explained in Chapter 12. As explained therein, the assessment of the impacts of the mine assumes that there will be good dust mitigation at all stages of the development. Key to this is proactive management of the site including forecasting when dust generating conditions may occur and putting appropriate mitigation in place before complaints are received. The main method of suppressing dust emissions is through the application of water using water bowsers on the unpaved haul routes, Fog Cannons® which spray a fine mist over a large area and are very effective at grounding dust particles, and mist sprays on coal handling equipment and coal stocking areas. An integral part of the management of dust emissions is monitoring in the local community, and a monitoring programme will be agreed with Caerphilly County Borough Council.

8.202 These measures would be expected to be effective in controlling dust emissions. In so far as there would be deposition of dust on vegetation, this would only be likely to occur to any significant degree close to areas where heavy equipment is in use over long periods, such as along the haul roads between the excavation area and the overburden stores, and the Cwmbargoed disposal point. As explained in Chapter 12 Air Quality, dust can have two types of effect on vegetation: physical and chemical. Any adverse effect due to physical processes, such as reduced photosynthesis or respiration and transpiration due to the deposition of dust, is naturally countered by the high level of rainfall experienced in this area. In this location any dust depositing on the leaves would be readily washed away by the frequent rain. More than 50% of days are wet days, as recorded by the rain gauge at the CDP. Chemical effects on vegetation are only likely to occur when dust whose chemistry is different from the natural soils in an area are deposited over long periods, for example where dust from a cement works is deposited on heathland vegetation. There is no likelihood of such significant effects as a result of the proposed operations.

8.203 Chapter 13 describes the sources of noise during the operation of the site and the measures which would be taken to minimise such noise. Wildlife generally readily habituates to noise associated with such operations when it is not associated with any particular threat. Sudden loud noises, such as the blasting operations described in Chapter 14, do cause disturbance of wildlife. However, although disturbance does occur, this is typically short-lived and does not

necessarily result in any particular harm to wildlife populations. The rich wildlife resources of military training areas used for artillery firing and similar very noisy activities clearly demonstrate this. Blasting would take place wholly within the opencast excavation area ahead of overburden being excavated, in an area where there would be a lot of movement and activity and the sounding of an audible warning immediately prior to each blast. The risk of blasting operations causing physical harm to wildlife is therefore very slight.

- 8.204 Whilst there would be considerable levels of human activity and machine operations within the active extraction area of the opencast void throughout the period of mining operations, large parts of the site would only be subject to disturbance for part of the operational period. For example, areas used for soil and overburden stores, and the haul roads serving them, would only be subject to significant disturbance during the construction of the stores in the early stages of working, and during removal of material from the stores at the end of operations. For the remainder of the operational period, these areas would be subject to little disturbance.
- 8.205 As for noise, wildlife typically habituates to heavy machinery, although humans on foot almost always result in disturbance of sensitive species. Given the nature of the proposed opencast operation, there is little potential for disturbance of wildlife beyond the active areas of the Nant Llesg site and this has been taken into account in assessing the impacts of the proposals.

Impact Duration and Likelihood

- 8.206 The duration of ecological impacts can range from temporary (lasting only a few days), through short (weeks or months), medium (1-5 years) and long term (5-25 years) to permanent (>25 years).
- 8.207 Impacts may be positive or negative in their effects, and the likelihood of impacts occurring will range from certain, through possible and unlikely, to uncertain. There may also be the risk of unscheduled events, incidents or accidents.
- 8.208 There may be cumulative effects, both of different impacts within the development, and also of the proposed scheme together with other proposals in the vicinity.
- 8.209 The Nant Llesg proposals have been designed, so far as practicable, to mitigate damage to nature conservation interests. Where mitigation is not practicable, compensation measures would be provided to offset the ecological impacts of the proposals.
- 8.210 As explained below, new ponds to provide habitat for great crested newt would be constructed in the east of the site prior to commencement of operations. These would also provide habitat for other amphibians. Suitable habitat features for reptiles, such as low south facing banks would also be constructed in this area.

Restoration Strategy

- 8.211 The Restoration Strategy for the Nant Llesg site (See Chapter 3 The Nant Llesg Project) sets out the measures to be taken to restore a landscape in keeping with and enhancing the landscape character and amenity of the area. This includes objectives to improve biodiversity interest of the site and to provide a range of habitats offsetting the habitat loss due to the operations. Drawing MA/NL/ES/16/012-2 shows the Restoration Strategy for the site. The Restoration Strategy document explains that the aim is to restore a landscape in keeping with and enhancing the landscape character and amenity of the area. Within that overall aim, there are a number of objectives for the strategy which include:
- To improve the biodiversity interest of the site; and
 - To provide a range of habitats offsetting the habitat loss due to the operations

8.212 For the purpose of description the restoration of the site is divided into a number of zones of different character as indicated on the Restoration Strategy plan at Drawing MA/NL/ES/16/012-2 as follows:

1. The Lapwing area;
2. The open upland
3. The northern slopes
4. The eastern valley side

1. The Lapwing area

8.213 This area south of South Tunnel Road and extending around the west of Fochriw is owned by Caerphilly County Borough Council and is included in the site in order that reclamation works can be carried out to resolve the problem of erosion of Fochriw Tip which contributes to pollution of the Nant Bargod Rhymini and silting up of the lake in Parc Cwm Darran.

8.214 This work would be taken forward in the early stages of the operation of the site, after which the area would remain undisturbed. Other than for any tip reclamation works, the land would be managed during the operational period for nature conservation, principally lapwings that nest and forage on the largely open ground.

2. The open upland

8.215 The open common land across the centre and south of the site would be restored to upland grassland over most of the area. In the south, between Rhaslas Pond and South Tunnel Road, peat saved from the initial soil strip would be laid over clays to landform and drainage conditions suitable for development of wet heathland. Part of Rhaslas Pond would have been infilled to provide support facilities for the surface mine, but the southern part would be retained with its dam. On restoration the material which had been used to partially infill Rhaslas Pond would be partly removed, the line of the former northern reservoir embankment would be delineated and a water area would be reinstated. This northern area of the pond would be shallower and graded to provide conditions for development of a broad wetland margin.

8.216 The western margins of the site would remain undisturbed throughout the operations and the restoration landform and vegetation would be merged with the existing in this area.

8.217 The open upland landform would be gently undulating with basins and valleys where surface water runoff can collect and be directed to watercourses that would reconnect with those beyond the site boundaries. A water treatment area in the south-east of the open upland, required for the operations, would be restored to a marshy or wetland area, drained by an existing stream. Other small ponds would be established along the western margin of the area, at intervals suitable for great crested newt habitat, extending the suitable habitat along the western boundary.

3. The northern slopes

8.218 This area is to the north of the open upland, where the land slopes northwards to Cwm Carno. It would be restored to enclosed fields of pasture, similar to the present landscape. On the lower slopes, the fields would be smaller and divided by hedgerows. Woodland would be established along the mid-slopes and the fields above the woodland would be larger and divided by stone walls. These fields would extend up to the edge of the common land, which would be defined by stone walling.

8.219 The water treatment area in the north-east of the area, required for the operations, would be removed and the land restored to pasture. In the north-west of the area, a stream course would be reinstated, and an area of flatter land along its course formed to encourage the development

of marshy grassland. More small ponds would be established along the mid-slopes, again at intervals suitable to extend the great crested newt habitat around the site.

4. The eastern valley side

- 8.220 The southern part of the valley side has been included in the site area in order to allow reclamation of hazards and tips remaining from old mines, which will require localised works while the majority of the area will remain undisturbed. The central and northern part of the area also contains old mine hazards which are to be remediated.
- 8.221 The land would be restored to fields of pasture, in a similar pattern to the northern slopes. The Rhymney valley side is sub-divided by stream valleys, along which woodland would be established and extended along part of the lower slopes near the industrial estate. A pattern of small fields divided by hedgerows would be established along the mid-slopes with larger fields divided by stone walls on the upper slopes, again extending to the stone wall marking the edge of the open upland. At the heads of these valleys, small basins of more gentle slopes would be formed, and peat laid over clay to encourage the development of wet heathland.
- 8.222 As in the rest of the site, small ponds would be established at intervals suitable for great crested newt, to extend the habitat around the site.

Seed Mixtures

- 8.223 Appropriate seed mixtures would be specified according to the soil types and to the proposed afteruse of the various areas of the site. The detailed restoration and aftercare proposals would be discussed and agreed with the WG Agriculture Dept and the Local Planning Authority. Indicative seed mixtures are provided in the Restoration Strategy.

Tree and Shrub Species

- 8.224 The principal areas of tree and shrub planting would be in the lower lying areas in the north and east of the site. There would also be planting of new hedgerows associated with the restored fields in the north of the site. Suitable species and specifications, including replacement requirements for failed stock, for these plantings would be discussed and agreed with the Local Planning Authority. Indicative lists of species suitable for woodland and hedgerow planting in this area are provided in the Restoration Strategy.
- 8.225 All tree and hedge plantings would be protected against grazing animals by fencing until the end of the aftercare period.

Pond Creation

- 8.226 As referred to in describing the restoration areas above, a number of ponds would be created as part of the operation and restoration of the site. These would include ponds created from water treatment areas which would be restored to provide wetland habitats, and also ponds created specifically for the conservation of great crested newts. Proposed locations of these ponds are shown on the Restoration Strategy plan (Drawing MA/NL/ES/16/012-2). The margins of new ponds would generally be constructed with gradients in the range 1:10 to 1:15 to encourage the development of marginal vegetation and aquatic fauna.

Aftercare Land Management

- 8.227 Grazing would be an important component of the aftercare land management and stocking rates are likely to vary according to the use of the various areas of the site. Stocking rates are normally stated as Livestock Units (LU) per ha. This is a method of describing different stock types and age groups based on their energy requirements. Standard ratios are used, commonly based on one livestock unit equalling one Friesian dairy cow. English Nature's Upland Management Handbook (English Nature 2001b) includes a table of Livestock Units, based on the MAFF Farm Business Survey as follows:

Stock type	Livestock Units	Stock type	Livestock Units
Cattle		Sheep	
Dairy cow	1.00	Ewes:	
Dairy bull	0.65	Light	0.06
Beef cow	0.75	Medium	0.08
Beef bull	0.65	Heavy	0.11
Heifers in calf	0.80		
Other cattle (not intensive beef):		Breeding ewe hoggs (1/2-1 year)	0.06
0-12 months	0.34		
12-24 months	0.65	Other sheep over 1 year	0.08
Over 24 months	0.80		
Horses	0.80	Rams	0.08
		Lambs	0.04-0.08
		Store lambs under 1 year	0.04

8.228 Not all schemes use the same values for Livestock Units. For example, Tir Gofal uses 0.15 LU for a sheep, 1.0 LU for a horse, 1.0 LU for a cow over 24 months and 0.6 LU for a cow under 24 months. Appropriate LU values for the stock to be grazed at the site would be agreed for the Aftercare Schemes with the WG Agriculture Department and the LPA. The following LU values have been assumed for the purposes of this strategy:

1 sheep= 0.15 LU

1 horse = 0.80 LU

1 cow = 0.65 LU

8.229 Preferred stocking rates on the enclosed fields at the north of the site once established, could be up to 2.25 LU/ha (equivalent to 15 sheep/ha, or 2.8 horses/ha, or 3.5 cows/ha), whilst on the wet grass heath, the preferred stocking rate would be not more than 0.15 LU/ha (1 sheep/ha, or 0.19 horses/ha, or 0.23 cows/ha). 0.45-0.75 LU/ha (3-5 sheep/ha, or 0.6-0.9 horses/ha, or 0.7-1.2 cows/ha) would be likely to be appropriate across the upland grassland areas to allow for development of good wildlife habitat.

8.230 Beyond the aftercare period, the future management of the restored agricultural land in the north of the site and the common in the south would be the responsibility of the farmer and commoners respectively, as is currently the case.

- 8.231 The common land at the south of the Nant Llesg site would include the area of restored wet heathland as well as extensive areas of restored grassland to the north and east as shown on the Restoration Strategy plan at Drawing MA/NL/ES/016/12-2. The grasslands on mineral soils would provide better quality grazing than wet areas restored on peat, and it is likely that stock would tend to avoid the wet heath areas in favour of the better quality grasslands. Thus in all likelihood, overgrazing of the wet heath would not occur as sheep would tend to use the nearby areas of better grazing on mineral soils which would be comparatively more attractive.

Assessment of Impacts

- 8.232 As explained above, the impacts of the scheme are assessed under the headings of land take, operation and restoration. The land take impacts are those which arise as a result of habitat loss through the physical clearance and footprint of the operational site and are assessed against the existing baseline. These would include the effects of clearance of vegetation and stripping of soils, creation of the void and the overburden mound. The operation effects are the additional effects over and above the effects of land take which may arise during the working of the site and could result from, for example, effects of dust, movement of vehicles, noise and discharges to water. The restoration effects are assessed through comparison of the Restoration Strategy (See Chapter 3 The Nant Llesg Project and outlined above) with the baseline situation prior to commencement of the scheme.

Statutory Designated Sites

- 8.233 Statutory designated sites in the vicinity of the Nant Llesg site are shown on Drawing MA/NL/ES/08/001. Statutory designated sites are of International (Very high) importance (SACs), National (High) importance (SSSIs) or County Borough (Medium) importance (LNRs).

Land take

- 8.234 The closest biological SSSI to the Nant Llesg site is the Cefn Brithdir SSSI which is some 2.7km away. This and all other SSSIs and European sites (in particular Aberbargoed Grasslands SAC, Usk Bat Sites SAC, Cwm Cadlan SAC and Blaen Cynon SAC) are too far away from the site for there to be any likelihood of significant effects and there is no doubt that there would be no adverse effects on its integrity. Bryn Bach Country Park, Parc Bryn Bach Local Nature Reserve, and Parc Cwm Darran and Cwmllydrew Meadows Country Park and Local Nature Reserve are closer to the site, the nearest being some 0.5km away, but again there is no likelihood of adverse effects on these sites. The land take effects on statutory designated sites would thus be of negligible magnitude and Negligible significance.

Operation

- 8.235 The only potential for off-site effects on such sites would be from changes in air quality or run-off from the site. During consultation, CCW and EAW specifically asked that the potential effects of dust deposition be considered on the Aberbargoed Grasslands, Usk Bat Sites, Cwm Cadlan and Blaen Cynon SACs.

- 12.2 As explained in Chapter 12 Air Quality of this ES, the impact of the exhaust emissions from the coal trucks, Nant Llesg traffic, the remediation of land, and the operation of the mine and the CDP on the Tair Carreg SINC was modelled using ADMS and ADMS-Roads. In addition the dust emissions were modelled using ADMS. The results are showed in Table 12.46 in Chapter 12.

- 12.3 The Tair Carreg Moor SINC receptors modelled are 310m (receptor 17) and 1,150m (receptor 18) from the coal working excavation area of the Nant Llesg Mine. The highest dust deposition occurs close to the CDP (receptor 18). At the closest modelled receptor to the coal working excavation area (receptor 17), the dust deposition is well below the indicative ecological EAL (see Table 12.46) and the impacts can be expected to reduce the further one moves from the site. The impacts on the Aberbargoed Grasslands SAC, Usk Bat Sites SAC, Cwm Cadlan SAC and Blaen Cynon SAC have not been modelled but it is considered, using professional judgement, that the SACs, which are significantly further from Nant Llesg than the modelled

receptors (the closest - Aberbargoed Grasslands SAC- being some 7.9km from Nant Llesg), will not experience dust deposition of any significance as a result of the operation of the mine, due to their distance from it. On this basis it can be concluded that there would be no likely significant effects on these European Sites and Appropriate Assessment under the Habitats Regulations is not required. Further, there is no doubt that there would be no adverse impact on the integrity of any SAC as a result of the Nant Llesg project.

- 8.236 There are no SSSIs designated for their nature conservation interest within 2km of the Nant Llesg site and again, although not modelled, it is considered, using professional judgement, that none are likely to be affected by the operation of the mine, due to their distance from it.
- 8.237 The Nant Bargod Rhymni which drains the south western part of the Nant Llesg site flows through the lake in Parc Cwm Darran. The measures which would be implemented to attenuate flows and prevent pollution of downstream watercourses as a result of drainage from the site are described in Chapter 11 Hydrology and Drainage. There are problems of silting up of the pond which may be attributed to, in part, material from Fochriw Tip (owned by Caerphilly County Borough Council) being eroded into the watercourse and deposited in the lake. The Nant Llesg proposals include undertaking remedial works on the tip on behalf of the County Borough Council, with the Council's agreement, which would assist in alleviating this problem.
- 8.238 The effects during operation on statutory designated sites are assessed as being of negligible magnitude and Negligible significance, using the methodology adopted in this chapter. To the extent that works may be carried out do improve the quality of water entering the lake at Parc Cwm Darran Country Park, then the overall effect on that site would be beneficial.

Restoration

- 8.239 Since there would be no effects on statutory designated sites as a result of the proposals, there are no restoration requirements directly linked to measures to mitigate effects on designated sites. Measures to protect the environment during operation would remain in place during the restoration works and would ensure there were no likely significant effects on any SAC's and no adverse effects on these or any other statutory designated sites. The effects of restoration on statutory designated sites would be of negligible magnitude and Negligible significance.

Non-Statutory Designated Sites

- 8.240 Non-Statutory designated sites in the vicinity of the Nant Llesg site are shown on Drawing MA/NL/ES/08/002. These are Sites of Importance for Nature Conservation (SINCs) and are of importance at the County Borough level.

Land take

- 8.241 The Cefn Gelligaer, West of Deri SINC is almost entirely within the Nant Llesg site in the area south of Rhaslas Pond extending to the south east of the site and also around the eastern margin into the centre east of site. Most of the SINC would be lost as a result of the operation of the site, primarily through overtipping with overburden. As explained in Chapter 9 Agricultural Land Use and Soils, as part of the operation of the site, the peaty soils south of Rhaslas Pond would be separately stripped and stored and would be respread across the area of the overburden mounds as the overburden is removed and a suitable seed mix sown. This would be some 14 years after the commencement of operations. However the period required for re-establishment and recovery of wet heath vegetation similar to that currently found across this area is uncertain. This area is part of the Gelligaer and Merthyr Common and would continue to be part of the common on completion of the scheme. Every effort would be made during the aftercare period to reinstate this habitat to seek to ensure that its long term development and improvement was facilitated.
- 8.242 The effect of land take on non-statutory designated sites would be of high magnitude and of Moderate significance.

Operation

- 8.243 The residual section of the Cefn Gelligaer outside the operational area of the mine but within the application area is along the eastern side. Other SINCs in close proximity to Nant Llesg are Tair Carreg Moor SINC which is to the west of the site across the Fochriw Road; Butetown, Llechryd and Rhymney Grasslands SINC, the Butetown component of which is some 50m to the north of Nant Llesg; the Nant Bargod Rhymni, Darran Valley SINC, the northern extremity of which is some 400m to the south of Nant Llesg although the Nant Bargod Rhymni watercourse itself rises at Rhaslas Pond within the Cefn Gelligaer SINC within Nant Llesg flowing southwards; the Nant Bargod Flush, Deri SINC is some 400m south of Nant Llesg; the Cwm Golau Sinc is some 400m to the south west; and the Pen March and Traed y Milwyr, Llechryd SINC is some 500m to the north.
- 8.244 As explained above in relation to statutory designated sites, the only potential for effects on such sites would be from changes in air quality or run-off from the site. Upland habitats in South Wales have a long history of degradation as a result of air pollution. Switching a significant proportion of power generation to natural gas and improved emission control technology on coal-fired power stations has resulted in significant reductions in acid deposition although it remains high enough to continue to cause damage. Enrichment by nitrogen compounds is also a significant concern (Simmons, 2003).
- 8.245 Despite reductions in sulphur deposition, nitrogen deposition remains relatively unchanged. Deposition of nitrogen can cause both acidification and eutrophication (nutrient enrichment) of plant communities and has been linked to changes in species composition. Plant species show a variety of responses to nitrogen deposition, which may also vary depending on the magnitude and duration of exposure and the presence of other environmental constraints. While some species are able to utilise the additional nutrient supply for growth other species (especially bryophytes and lichens) may suffer toxic effects, leading to reduced growth or death. Increased nutrient availability may also allow faster growing tall species such as grasses to out-compete slow- and low-growing species (Jones, 2007).
- 8.246 Upland habitats are typically nutrient-poor, with low soil nitrogen mineralisation rates. Thus long-term increases in atmospheric nitrogen deposition can result in eutrophication. Damage to upland habitats resulting from pollution and climate change can be exacerbated by heavy grazing levels.
- 8.247 The Cefn Gelligaer SINC includes Fochriw Tip (included in the site in order to facilitate land reclamation works on behalf of Caerphilly County Borough Council). This site was included in a survey of heathland and associated habitats on coal spoil in Wales carried out for CCW in 2007 (Middlemarch Environmental Ltd, 2007). Colliery spoil in South Wales supports a range of habitats, some of which are restricted to the harsh, bare spoil environment and include unusual lichen-rich heaths and areas of open flower-rich vegetation. The dominant vegetation on Fochriw Tip was a complex grassland community with no overall dominant species, and with heavily grazed areas where bryophytes were the most conspicuous vegetative feature. There were also areas of mire dominated by rushes with seepages and heavily poached areas. There was no distinct area of lichen heath and Fochriw Tip was assessed as being of medium conservation interest.
- 8.248 As reported in Chapter 12 Air Quality, the dust deposition indicative environmental assessment level of 1000mg/m²/day is predicted to be exceeded at the ecological receptor closest to the CDP which is in the south of the Tair Carreg Moor SINC. This is due to the high baseline dust deposition which already exceeds the indicative EAL. The proposed mine is predicted to increase the baseline dust deposition at this receptor by 21%. As explained earlier in this chapter, deposit of dust on leaf surfaces can reduce rates of photosynthesis, and can affect rates of gaseous exchange by blocking of stomata. Soiling of vegetation by dust can also be unsightly. In this area, the high rainfall will mitigate against these effects by washing dust off the vegetation. Significant effects on vegetation are only likely to occur when dust whose chemistry is different from the natural soils in an area are deposited over long periods, for example where dust from a cement works is deposited on heathland vegetation. Since the

chemistry of dust deposition resulting from operations on site is likely to be similar to the natural soils in the area there is no likelihood of significant effects as a result.

- 12.4 The daily NO_x concentration and the nitrogen deposition EALs are predicted to be exceeded in the south of the Tair Carreg Moor SINC with Nant Llesg, again mainly due to high baseline levels. The daily NO_x concentration is also predicted to be exceeded in the north of the SINC. The area of exceedence will be relatively small as road emissions decline rapidly with distance from the edge of the road.
- 12.5 As set out above, plant species show a variety of responses to nitrogen deposition, which may also vary depending on the magnitude and duration of exposure and the presence of other environmental constraints. While some species are able to utilise the additional nutrient supply for growth other species (especially bryophytes and lichens) may suffer toxic effects, leading to reduced growth or death. Increased nutrient availability may also allow faster growing tall species such as grasses to out-compete slow- and low-growing species.
- 8.249 Upland habitats are typically nutrient-poor, with low soil nitrogen mineralisation rates. Thus long-term increases in atmospheric nitrogen deposition can result in eutrophication. Damage to upland habitats resulting from pollution and climate change can be exacerbated by heavy grazing levels. Thus, close to those areas of the Nant Llesg site where there is significant movement of vehicles, including parts of the Tair Carreg Moor SINC there may be some changes in the vegetation as a result of nitrogen deposition. However, as described in the report of the CCW survey of habitats in Wales (Blackstock, T.H et al., 2010):

“The overall impact of N enrichment from atmospheric deposition is still something of a conundrum to ecologists in Britain. Widespread indicative effects have been recently revealed by monitoring results from the Countryside Survey 2000, as plant taxa favouring N-rich environments have increased widely over the UK..... But the responses of semi-natural vegetation appear to be subtle and may be overshadowed by other controlling influences, for example intensive grazing and constraints due to low levels of phosphorus and other nutrients...”

- 8.250 Monitoring of vegetation within the Tair Carreg Moor SINC as part of the Ffos y Fran Land Reclamation Scheme shows that no significant changes in community structure and composition have occurred when compared to the three years of baseline data (i.e. 2005 to 2007, surveyed prior to the commencement of the Ffos y Fran Land Reclamation Scheme). It is likely that small changes in vegetation identified were the result of reduced grazing pressure and wet summers in 2008 and 2009. Drier conditions and heavier grazing experienced in 2010 and 2011 are the most likely reasons for some of the main changes noted but all communities show very little change over all. These findings are supported by analysis of indicator species which largely show limited changes in abundance over the eight year study period. Two species, springy turf-moss *Rhytidiadelphus squarrosus* which has increased, and cross leaved heath which has decreased, show trends that might suggest conditions might have become drier. However, given some exceptionally wet growing seasons experienced in recent years this seems unlikely to be the case and these changes are more likely the result of reduced grazing pressure resulting in a greater dominance of purple moor grass and robust bryophytes. This accords with CCW's findings that other factors tend to be more important than air quality at individual sites.
- 8.251 Other locally designated sites (with the possible exception of those remaining parts of the Cefn Gelligaer SINC around the margins of the Nant Llesg site) will not experience dust or nitrogen deposition at a level that will adversely affect vegetation. There are two Country Parks incorporating LNRs in the vicinity of Nant Llesg. These are Parc Brynbach (0.5km away). A part of that site is also an LNR (2km away)) and Parc Cwm Darran & Cwmllydrew Meadows (1km away) and these are similarly not likely to be affected by changes in air quality.
- 8.252 The potential effects of discharge of mine water to the Nant Bargod Rhymni are referred to in relation to Parc Cwm Darran Country Park and LNR in the section on statutory sites above. The measures which would be implemented to attenuate flows and prevent pollution of downstream watercourses as a result of drainage from the site are described in Chapters 10

and 11. There is also the potential for the water supply to the headwaters of the stream to be reduced during periods of dry weather. This is not likely to have a significant effect on the lake in Parc Cwm Darran. The Nant Llesg proposals include the undertaking remedial works on Fochriw Tip on behalf of Caerphilly County Council which would improve water quality in the watercourse of the Nant Bargod Rhymini and reduce siltation in the lake at Parc Cwm Darran.

- 8.253 The operational effects on non-statutory designated sites would be of low magnitude and Minor significance.

Restoration

- 8.254 As explained in Chapter 9 Agricultural Land Use and Soils, as part of the restoration of the site, when the overburden stores were removed, the area south of Rhaslas Pond would be returned to approximately the same levels and topography as the pre working condition. The peaty soils would be taken from store and spread over the area and the area sown with a suitable seed mix. The land would be managed during the aftercare period by means of cutting, grazing, fertilizer applications (if necessary) and weed control to seek to establish wet heath vegetation.
- 8.255 To the extent to which the restoration may achieve the desired vegetation type, then it may in due course be of sufficient value to be designated as a SINC once more. In order to achieve such designation the site would need to satisfy the criteria set out in 'Criteria for the Selection of Sites of Importance for Nature Conservation in the County Boroughs of Blaenau Gwent, Caerphilly, Merthyr Tydfil and Rhondda Cynon Taff (The 'Mid-Valleys Area')' (June 2008).
- 8.256 If this is achieved then the effects of restoration on non-statutory sites would be of negligible magnitude and negligible significance. To the extent that this was not achieved then the impact would remain as for land take as of high magnitude and moderate significance.

Habitats

- 8.257 The habitats within the Nant Llesg site are shown on the Phase 1 Habitat Survey plan at Drawing MA/NL/ES/08/003.

Land Take

- 8.258 The areas of each habitat (or lengths where appropriate, and in the case of ponds, the number of ponds) within the application boundary are set out in Table 8.7 below.

Table 8.7 Habitats within the application site

Habitat	Extent within application site	Extent within operational areas	Value
Acid dry dwarf shrub heath	0.62ha	0.29ha	County Borough (Medium)
Wet dwarf shrub heath	47.49ha	41.18 ^{ha}	County Borough (Medium)
Acid flush	3.15ha	2.42ha	County Borough (Medium)
Rivers and streams (running water)	5966m (linear)	2568m (linear)	Community (Low)

Habitat	Extent within application site	Extent within operational areas	Value
Lakes and reservoirs (standing water)	12.70ha (includes ponds)	12.30ha (includes ponds)	County Borough (Medium)
Hedgerows	3248m (linear)	2746m (linear)	Community (Low)
Unimproved acid grassland	120.00ha	56.00ha	County Borough (Medium)
Semi-improved acid grassland	62.00ha	59.00ha	Community (Low)
Poor semi-improved grassland	7.24ha	3.90ha	Community (Low)
Improved grassland	133.93ha	100.41ha	Community (Low)
Marshy grassland (includes Purple moor-grass marsh)	57.64ha	43.31ha	County Borough (Medium)
Inland Rock Outcrop and Scree Habitat (natural inland cliff and quarry)	1404m (linear)	894m (linear)	Community (Low)
Dry ditch	4258m (linear)	3021m (linear)	Community (Low)
Semi-natural broadleaved woodland	0.01ha	0.01ha	Community (Low)
Mixed plantation	0.97ha	0.83ha	Community (Low)
Coniferous plantation	2.36ha	0.03ha	Community (Low)
Naturally Revegetated Colliery Spoil	15.63ha	0.00ha	Community (Low)

Habitat	Extent within application site	Extent within operational areas	Value
(ephemeral/short perennial vegetation)			
Stone Walls	116m (linear)	0.00m (linear)	Community (Low)

8.259 The table also indicates the extent of the habitats within the identified operational areas of the site. The actual extent of loss of habitat would be between the two figures depending on how much of the site outside the identified operational areas remains undisturbed. In the worst case the entire application area would be disturbed.

8.260 It can be seen that the most extensive losses of habitat (as measured within the entire site area) would be of unimproved acid grassland (120ha), improved grassland (134ha), semi-improved acid grassland (62ha), wet dwarf shrub heath (48ha) and marshy grassland (58ha). The wet dwarf shrub heath and marshy grassland are important features of the Cefn Gelligaer, West of Deri SINC referred to above. The area of lakes and reservoirs (some 12.7ha) is primarily Rhaslas Pond (some 10ha) but includes the area of the other ponds within the site.

8.261 In view of the extent of loss of the habitats of County Borough importance the magnitude of impact is assessed as high and the significance as Moderate.

Operation

8.262 During operation, the main potential effects on habitats in the vicinity of the site would be as a result of changes in air quality and hydrology.

8.263 Vegetation may be affected through changes in air quality through:

- Atmospheric pollutant concentrations; and
- Deposition of certain pollutants.

8.264 Drawing MA/NL/ES/08/007 shows the vegetation in the area surrounding the Nant Llesg site (based on CCW Phase 1 Habitat Survey data (1979-1997). Although now relatively dated, no major changes are considered, using professional judgement, to have taken place in the vegetation in this area since the surveys were carried out. It can be seen that the vegetation in this area largely comprises wet dwarf shrub heath and marshy grassland.

8.265 As explained earlier in this chapter, upland habitats in South Wales have a long history of degradation as a result of air pollution. Despite reductions in sulphur deposition, nitrogen deposition remains relatively unchanged. Upland habitats are typically nutrient-poor, with low soil nitrogen mineralisation rates, and long-term increases in atmospheric nitrogen deposition can result in eutrophication. There could be adverse effects on vegetation close to those parts of the Nant Llesg site where there were significant traffic movements. This is in those areas close to the Cwmbargoed Disposal Point.

8.266 The measures which would be implemented to attenuate flows and prevent pollution of downstream watercourses as a result of drainage from the site are described in Chapter 11. There is also the potential for the water supply to the headwaters of the stream to be reduced during periods of dry weather. The Nant Llesg proposals include the option of undertaking remedial works on Fochriw Tip on behalf of Caerphilly County Council which if implemented would contribute to improved water quality in the watercourse Nant Bargod Rhymini.

8.267 One of the benefits of the Nant Llesg scheme would be that the water quality in the River Rhymney south of the Rhymney culvert would be expected to improve. As explained in Chapter 10 Hydrogeology, during the works mine water would be intercepted and treated before it enters the watercourse. This would result in a temporary benefit on water quality in the River Rhymney downstream of the Bute culvert.

8.268 On the basis of the above assessment the magnitude of the effects on habitats beyond the operational area of the site would generally be of negligible magnitude and Negligible significance.

Restoration

8.269 Drawing MA/NL/ES/016/12-2 shows the Restoration Strategy for the Nant Llesg site. The Restoration Strategy document (See Chapter 3 The Nant Llesg Project), the ecological components of which have been referred to earlier in this chapter, explains that the aim is to restore a landscape in keeping with and enhancing the landscape character and amenity of the area. Within that overall aim, there are a number of objectives for the strategy which include:

- To improve the biodiversity interest of the site; and
- To provide a range of habitats offsetting the habitat loss due to the operations.

8.270 The effects of the restoration proposals for the site on wildlife habitats would be to offset the adverse effects of the original land take on wet heath and acid grassland habitats. There would also be benefits as a result of the increased area of woodland and length of hedgerows on the site, as well as new pond and wetland habitats. However, given the ecological significance of the habitats lost to the scheme, and the uncertainty regarding the effectiveness of restoration of these habitats of county importance, the overall significance of the effects compared to the existing baseline would be Minor to Moderate adverse.

8.271 As explained in Chapter 10 Hydrogeology, there would be a benefit to water quality in the River Rhymney downstream of the Nant Llesg site as the project would remove a proportion (~20%) of the coal seams and old workings which are contributing to the elevated metals and sulphate concentrations which are affecting the quality of the River Rhymney.

Species

Amphibians

8.272 Ponds in the area around the site are known to support great crested newt. A single juvenile great crested newt was recorded during the surveys of the Nant Llesg site and a possible adult great crested newt was seen. A second individual was reported close to the south of the site. This is sufficient to confirm that the species is present. It is typical of the area that only small populations are present in individual ponds. These small populations together constitute a local metapopulation, which overall is considered to be of moderate size and is valued as being of County Borough importance.

8.273 Palmate newts were present in 20 of the ponds surveyed and smooth newt may be present. Common frog and/or common toad were also present in 20 of the ponds surveyed. At the junction of the Fochriw Road and the South Tunnel Road toads regularly cross the road in the spring to reach their breeding ponds.

Land take

8.274 Eighteen ponds would be lost as a result of the proposed Nant Llesg development. There would also be loss of areas of marshy grassland/wet heath habitat of value to great crested newt, and other amphibians, in the areas around the ponds.

- 8.275 In advance of the works new ponds would be constructed at suitable locations in the east of the site. These ponds would be at a lower elevation than the ponds which would be lost, and a number would be close to existing woodland and new woodland to be planted as part of the scheme. These new habitat features would be better located for amphibians than the current elevated open situations of the ponds which would be lost. A capture and translocation exercise would be carried out in advance of the works and the newts captured would be transferred to the new ponds. This would be carried out under a European Protected Species Licence from NRW under Regulation 53 of the Habitats Regulations. The detailed methodology would be agreed with NRW in advance of the licence application.
- 8.276 The loss of habitat for amphibians would thus be mitigated by the provision of the new ponds, and associated planting areas.
- 8.277 The success of pond creation and translocation of amphibians in the area has been demonstrated by the work carried out at the Ffos y fran Land Reclamation Scheme. Monitoring has shown that viable populations of great crested and palmate newts have been established in ponds created in Cwm Golau to which they were transferred in advance of the commencement of operations at Ffos y fran.
- 8.278 Construction of the new water treatment areas to the west of the railway in Cwm Golau would result in the loss of terrestrial habitat which is likely to be used by great crested newts and other amphibians which breed in the ponds to the south. The ponds themselves would not be affected. To the extent that this may result in disturbance of great crested newt, this work may also be subject to a European Protected Species Licence. The ecological improvements for Bryn Caerau Farm described later in this Chapter which would include improvements to existing ponds and construction of new ponds, as well as planting of hedgerows and woodland, and improved grassland management, would ensure that the loss of habitat is compensated and the favourable conservation status of the species in this area is maintained.
- 8.279 The disturbance to amphibians, taking into account the mitigation measures, which are of proven effectiveness, would be of low magnitude and Minor significance.

Operation

- 8.280 During the operation of the site the ponds and surrounding terrestrial habitat to which great crested newts and other amphibians had been transferred, would be managed so as to ensure that they were maintained in a suitable condition to support the species. Such management has been a feature of the ponds created as part of the Ffos-y-fran scheme and has been demonstrated to be successful in maintaining a viable population of great crested newts.
- 8.281 Lorries transporting coal from the mine to the Cwmbargoed Disposal Point would result in additional traffic on the Fochriw Road at the junction with the South Tunnel Road where common toads cross during the breeding season. This could result in additional mortality of toads. In order to mitigate for this, toad crossings would be provided across both the Fochriw Road and the South Tunnel Road at this location. These would comprise ACO AT500 wildlife tunnels (or similar suitable approved alternative) installed flush with the road surface. Detailed design would be agreed with Caerphilly CBC.
- 8.282 The effects of the operational phase of the scheme on amphibians is thus assessed at worst as being of Negligible magnitude and significance, but to the extent that the great crested newt population may well increase (as could other amphibian species), and toad crossings would protect the animals from both the existing traffic as well as the additional traffic resulting from the Nant Llesg project, it could well be Beneficial.

Restoration

- 8.283 The restoration of the site would reinstate the upland areas of the site to similar vegetation to that which currently exists. Further ponds would be created by adapting the water treatment lagoons. The ponds created around the margin of the site would continue to be maintained to ensure they remained suitable for great crested newt in accordance with the likely requirements

of the European Protected Species licence. The network of hedgerows and woodlands in the northern part of the site would provide good habitat connectivity for amphibians

- 8.284 There would thus be overall benefits to the amphibian populations of the site, and in turn this would be beneficial to the wider metapopulation of great crested newts in the area as a result of the restoration of the site. The significance of this is assessed as Minor beneficial.

Licensing

- 8.285 As stated above, a European Protected Species licence under Regulation 53 of the Habitats Regulations would be sought to ensure that procedures are in place to protect great crested newts from harm as a result of the proposals. The relevant provisions of Regulation 53 are:

1. Regulation 53(2)(e) states: a licence can be granted for the purposes of “preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”.
2. Regulation 53(9)(a) states: the appropriate authority shall not grant a licence unless they are satisfied “that there is no satisfactory alternative”.
3. (3) Regulation 53(9)(b) states: the appropriate authority shall not grant a licence unless they are satisfied “that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.”

- 8.286 In order that such a licence can be granted, NRW must be satisfied that these three tests are satisfied.

- 8.287 With respect to the first test, the Planning Statement submitted with the planning application sets out the public safety and socio-economic benefits of the proposals and these are summarised in Chapter 20 ‘Summary and Conclusions’ of the statement. This sets out the benefits associated with the proposals which would include the remediation of historic mining dereliction associated with the treatment of mining shafts and adits, which will improve public amenity and create safe conditions for public access to extensive areas of land; and demonstrable employment and economic benefits associated with direct and indirect employment and the overall contribution to the local economy.

- 8.288 With respect to the second test, since the proposals relate to the working of coal and the remediation of land at Nant Llesg they are clearly site specific and can only be implemented within the site. Chapter 15 of the Planning Statement sets out the need for the Nant Llesg Coal and explains that this arises from the severe shortage of supply compared to demand and the over-riding need for an additional large scale resource to be consented. The rapidly dwindling supply of Welsh steam coal requires new resources to be released in order to meet demand, reduce imports and provide the necessary confidence on which important anchor companies in Wales can make key investment decisions. Consideration of alternative sites is thus not relevant.

- 8.289 So far as practicable, ponds which may be used by great crested newt have been excluded from the operational areas. However, the location of ponds within the site is such that if all such areas were to be excluded, the operation of the site would not be practicable. There is thus no alternative to the proposals if the working of coal and land remediation at the site is to be undertaken.

- 8.290 With respect to the third test, a methodology for the translocation of great crested newts from the working area would be developed in consultation with NRW. As referred to above the principles of the methodology would be, in advance of the works, to construct new ponds at suitable locations in the east of the site. A capture and translocation exercise would be carried out in advance of the works and the newts captured would be transferred to the new ponds.

These measures would ensure that the conservation status of the species in the area would be maintained. The methodology would be finalised in consultation with NRW prior to submission with the licence application subject to grant of planning consent.

- 8.291 Whilst the measures are specifically designed for the protection of great crested newts, any other amphibians captured would also be transferred to suitable habitats outside the working area.
- 8.292 It can be seen that the three tests under the Habitats Regulations are satisfied and that the necessary licence is likely to be granted.

Reptiles

- 8.293 One species of reptile; common lizard, was recorded within the site in areas of rough grassland and scattered rocks around a disused tip, a pond, the southern bank of Rhaslas Pond and a stone wall. These areas were to a degree connected and common lizards are likely to move between them. The population of common lizard is assessed as being of Community (Low) importance.

Land Take

- 8.294 All of the area within which the reptiles were found would be within the operational area of the site and would be lost. Prior to the commencement of work in this area of the site, a series of low south facing banks would be constructed in the area of land outside the operational area of the mine in the east of the site in areas of vegetation that would not otherwise be affected by the development which would provide good cover and feeding areas for reptiles. A trapping exercise would be carried in advance of the works and the reptiles transferred to the prepared area.
- 8.295 The disturbance to reptiles, taking into account the proposed mitigation measures, would be of medium magnitude and the significance Minor.

Operation

- 8.296 The area of habitat in the east of the site improved for common lizard would continue to be managed for the species during the operation of the site. The effects of the operation of the site on reptiles are assessed as being of negligible magnitude and negligible significance.

Restoration

- 8.297 As explained above, restoration of the site would involve establishment of vegetation of similar character to that currently present across the site. Features to encourage use by reptiles, such as low south facing banks, would be incorporated into the detailed restoration design in suitable areas. The effects of restoration of the site are assessed as being of negligible magnitude and significance, but based on the potential for the overall population of common lizard in the area of the site to increase then the effect could be beneficial.

Bats

- 8.298 At least four species of bat were recorded during bat surveys of the Nant Llesg site; common pipistrelle was found to be abundant on the site and soprano pipistrelle and *Myotis* bats were recorded frequently. A noctule was recorded once.
- 8.299 Areas of open water, including Rhaslas Pond, a fishing pond and a number of smaller ponds, were identified as features of Medium bat interest on the site. A high density of bat contacts were recorded in these areas and sustained foraging was recorded at times. High levels of activity were recorded during automatic surveys within an area of rough grassland in the centre of the site and around a woodland strip along the eastern boundary.

- 8.300 During some surveys periods of very high levels of activity were recorded in the centre of the site. Feeding buzzes confirmed that bats were foraging in this area but it is also likely that bats were commuting to and from potential roost sites in Rhymney to the foraging sites around Rhaslas Pond and surrounding habitats.
- 8.301 Areas of Medium bat interest were identified in the centre-west of the site and around parts of the southern and eastern boundaries. The remaining parts of the site were of overall Low bat interest.
- 8.302 No evidence of bat roosts within the site was found during the bat surveys.
- 8.303 The value of the site for bats given the absence of roosts and the general Low bat value with some localised areas of Medium value is assessed as Community.

Land Take

- 8.304 Working of the site would remove bat foraging habitat of Low value across most of the site with some localised areas of Medium value (including Rhaslas Pond) with the exception of the tree belts along the eastern margin which would be retained.
- 8.305 The effect of the loss of these habitats on bats is assessed as of medium magnitude and of Minor significance.

Operation

- 8.306 During operation of the site there would be no additional adverse effects on bats in the area of the site. There would be some beneficial effects due to the provision of additional ponds and woodland planting in the east of the site. The effects on bats during operation of the site are therefore assessed as at worst of negligible magnitude and significance and could be beneficial.

Restoration

- 8.307 Restoration of the site would reinstate vegetation of similar character to that which currently exists across the site, other than in the north where there would be extensive woodland planting linked by a network of hedgerows. This would improve this area of the site for bat foraging and commuting. The effect of restoration of the site on bats is therefore assessed as of negligible magnitude and negligible significance but could be beneficial.

Otter

- 8.308 Survey findings indicate that otters occasionally migrate along water-courses in the area of the site for the purposes of foraging in Rhaslas Pond and other waterbodies, but these areas probably do not represent the core territory for any individuals, and are only used on an occasional basis. It appears that otters in the Nant-Llesg site generally come from the south, rather than the north. Otters are most likely to access the site via the Nant Bargoed Rhymney and River Rhymney. Known otter activity on water-courses further to the west, such as the Nant Gyrawd and Bargoed Taf may also contribute to the levels of activity on Nant Llesg.
- 8.309 Given the limited and apparently occasional use of the site by otters, Nant Llesg is assessed as being of Community value for the species.

Land take

- 8.310 Development of the site would result in the partial infilling of Rhaslas Pond (which would become effectively inaccessible to otters as a result of the disruption to watercourses and its location within the operational area of the mine) and the loss of the headwaters of the Nant Bargod Rhymni and other minor water courses.

- 8.311 Given the low levels of otter activity in the area the magnitude of the effects of the land take of the site are assessed as medium and the significance Minor.

Operation

- 8.312 During the operation of the site there would be no further effects on waterbodies or watercourses of value to otters. As explained in Chapter 11, measures would be implemented to attenuate flows and maintain the quality of downstream watercourses. There would be no requirement for overall lighting of the site other than locally in areas where works were taking place, and so off-site light levels would not be such that otters would be affected.
- 8.313 As explained in Chapter 11 Hydrogeology, one of the benefits of the Nant Llesg scheme would be that the water quality in the River Rhymney south of the Rhymney culvert would be expected to improve as a result of the interruption of the Rhaslas drain within the void and the diversion of water from it to water treatment areas prior to discharge into the River Rhymney. This improvement in water quality and hence the ecology of the watercourse should be of benefit to otter. The works to Fochriw Tip could also benefit otter by improving the condition of the lake in Parc Cwm Darran downstream of the site.
- 8.314 The effects of the operation of the site would be of negligible magnitude and significance and would be beneficial.

Restoration

- 8.315 Restoration of the site would involve the reinstatement of the infilled section of Rhaslas Pond with the outline of the removed northern embankment being created, the material used to infill the pond creating a graded wetland margin and the outflow to the River Rhymney being reinstated. Surface watercourses draining the site would be re-established. These features would once again provide corridors for movement of otters and foraging habitat. Furthermore, water quality in the River Rhymney would be improved as a result of the removal of a significant proportion of the coal which is the source of the acid minewater which enters the watercourse. Additional foraging habitat would be provided by the ponds which would be established at the sites of former water treatment areas.
- 8.316 The effects of restoration of the site on otter are assessed as of negligible magnitude and significance and could be beneficial.

Breeding Birds

- 8.317 A total of 61 species was recorded during the breeding bird survey, 37 species were confirmed to be breeding. Little ringed plover was present in numbers of importance at the Welsh geographical scale; Lapwing was present at numbers of Welsh importance and the population is part of the wider Heads of the Valleys metapopulation. Ringed plover and snipe were present in numbers of County Borough importance. Other species of note were skylark, dunnock, song thrush, starling, house sparrow, linnet, bullfinch, reed bunting and willow warbler.

Land Take

- 8.318 Two pairs of little ringed plover bred adjacent to Rhaslas Pond. The nesting area would be lost to development. Whilst it is possible that they would nest in open stony areas created as a result of the operation of the site, as is the case within the Ffos y Fran Land Reclamation Scheme, this cannot be certain and for the purposes of assessment it is assumed that this species would be lost from the site. This would be an impact of high magnitude on a population of national importance and thus of Major significance.

- 8.319 There is the potential to provide suitable habitat for little ringed plover in the Central Ecological Area of the Ffos y Fran Land Reclamation Scheme. However, little ringed plover have already nested in this general area, and this may not result in sufficient replacement habitat for both of the pairs recorded at Rhaslas Pond. In view of this uncertainty the level of significance of the impact assessed has not been reduced.
- 8.320 Eight pairs of lapwing bred on the open level area of Fochriw Tip in the south of the site. This area is only included within the site boundary to enable works to be carried out to remedy erosion problems on the eastern side. The area used by the lapwings would not be affected. One pair of lapwing bred on the western edge of Rhaslas Pond. This area would be affected by the works. This would be an impact of medium magnitude on the population of national importance and thus of Moderate significance.
- 8.321 Two pairs of ringed plover bred on the margins of Rhaslas Pond in an area that would be lost to the development of the site. This would be an impact of high magnitude on the population of County Borough importance and thus of Moderate significance.
- 8.322 Two pairs of snipe were recorded, one in the area of Fochriw Tip which would not be affected by the development, and the other in the area between Rhaslas Pond and the South Tunnel Road which would be lost. This would be an impact of high magnitude on the population of County Borough importance and thus of Moderate significance.
- 8.323 Other species of conservation importance which bred within the site in areas which would be affected were skylark, wheatear, linnet and reed bunting. The loss of these breeding bird populations is assessed as of high magnitude on populations of community importance and thus of Minor significance.
- 8.324 Of the other breeding birds of conservation importance a number nested around the margins of the site and would not be significantly affected. These include dunnock, song thrush, mistle thrush, willow warbler, starling, house sparrow and bullfinch. For these species the effects area assessed of negligible magnitude and negligible significance.
- 8.325 On the basis of the effects on the breeding birds referred to above the overall effects of land take on breeding birds as a result of loss of habitat is assessed as of high magnitude and Major significance.

Operation

- 8.326 Chapter 13 describes the sources of noise during the operation of the site and the measures which would be taken to minimise such noise. Wildlife generally, including birds, readily habituates to noise associated with such operations when it is not associated with any particular threat. Sudden loud noises, such as the blasting operations described in Chapter 14, do cause disturbance of wildlife. Although disturbance may occur, this is typically short-lived and does not necessarily result in any particular harm to wildlife populations. Blasting would take place wholly within the opencast excavation area ahead of overburden being excavated, in an area where there would be a lot of movement and activity and the sounding of an audible warning immediately prior to each blast.
- 8.327 Whilst there would be considerable levels of human activity and machinery operations within the active extraction area of the opencast void throughout the period of opencast operations, much of the site would only be subject to disturbance for part of the operational period. For example, areas used for soil and overburden stores, and the haul roads serving them, would only be subject to significant disturbance from human activity and machinery operations during the construction of the stores in the early stages of working, and during removal of material from the stores at the end of operations. For the remainder of the operational period, these areas would be subject to little such disturbance. As for noise, wildlife is able to habituate to heavy machinery, although humans on foot typically always result in disturbance of sensitive species.

- 8.328 The additional effects on breeding bird populations during the operation of the site are thus assessed as of low magnitude and thus of Minor significance.

Restoration

- 8.329 Restoration of the site would reinstate vegetation of similar character to that which currently exists across the site, other than in the north where there would be extensive woodland planting linked by a network of hedgerows. This would improve this area of the site for nesting birds. However, the time taken for the recovery of the full functionality of the ecosystems established and the inevitable loss of complexity compared to the current site means that the full range and size of populations may not recover for a considerable time after restoration. Restoration would include reinstatement of bare marginal areas at Rhaslas Pond suitable for little ringed plover.
- 8.330 The effects of restoration compared to the current baseline are thus assessed overall as being of medium magnitude and of Moderate adverse significance.

Wintering/passage birds

- 8.331 The winter bird assemblage recorded at the site in 2008/2009 was a mixture of common, lowland, wider-countryside or urban species such as wren, house sparrow, robin, buzzard, carrion crow, blue tit, rook, jackdaw, magpie and blackbird and more typical upland species such as meadow pipit, raven and stonechat. Several declining species often associated with lowlands such as skylark, song thrush and starling were also seen, many of which were also present in the areas of rougher grassland. Reed buntings were observed feeding in and around the tree planting belts and the allotments at Fochriw. Five specially protected species, seven UK BAP Priority species, five red-listed species of high conservation concern and sixteen amber-listed species of medium conservation concern were observed at the site.
- 8.332 The diversity and abundance of species recorded during the 2011/2012 survey was similar to that previously found during 2008/2009. However, counts of lesser black-backed gull, herring gull and starling were significantly greater in 2011/2012 possibly as a result of changes in landfill activity adjacent to the survey area.

Land Take

- 8.333 Development of the site would result in the loss of the key areas for wintering birds within the site. These are Rhaslas Pond for wintering waterfowl and the area south of Rhaslas Pond for species such as snipe, jack snipe and reed bunting. Loss of these areas would remove significant wintering habitat for these species. Given that some of these populations are of County Borough importance, this would be an overall impact of Moderate significance.

Operation

- 8.334 The operation of the site would only have limited effects on wintering birds, over and above the effects of land take, as a result of disturbance from the noise of machinery and overall levels of activity associated with the excavation of overburden and coal, and transport of coal to the Disposal Point. The additional displacement effects as a result of the mining operations on wintering bird populations during the operation of the site are thus assessed as of low magnitude and thus of no more than Minor significance.

Restoration

- 8.335 Restoration of the site would reinstate vegetation of similar character to that which currently exists across the site, other than in the north where there would be extensive woodland planting linked by a network of hedgerows. This would provide improved habitat for farmland wintering

birds such as fieldfare and redwing, finches and tits. The restored Rhaslas Pond would be smaller than the existing reservoir, and this would reduce its attractiveness to wintering waterfowl. South of Rhaslas Pond, the time taken for the recovery of the full functionality of the ecosystems established and the loss of complexity means that the full range and size of populations may not recover for a considerable time after restoration. The effects of restoration on wintering birds compared to the current baseline are assessed overall as being of medium magnitude and of Moderate adverse significance.

Terrestrial Invertebrates

- 8.336 The site supports a generally low invertebrate biodiversity overall. A total of 177 invertebrate species were recorded. Small heath butterfly was recorded which is on the list of Species of Principal Importance prepared under Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006 and UK BAP Priority Species (UK Biodiversity Reporting and Information Group 2007). Four "Research Only" BAP moth species were recorded (dusky brocade, shoulder-striped wainscot, white ermine and the anomalous); several others are likely to be present. Three species listed as Nationally Local were recorded. These were a species of dor beetle, a hoverfly and the scarce silver-y moth).
- 8.337 Supplemental recording of Lepidoptera was carried out during the dragonfly survey visits. A total of 21 species of Lepidoptera were recorded. Three species (grayling, small heath and broom moth) are on the list of Species of Principal Importance (S42 NERC Act 2008) and UK BAP Priority Species; and one species (grayling) is also a Locally Important Species (as identified by local specialists) in the SEWBRc area.

Land Take

- 8.338 The land take for the site would remove large areas of habitat for invertebrates, including that of the more notable species such as small heath and grayling butterflies, and Broom moth. The overall effect is assessed as being of high magnitude on features of up to County Borough importance and thus of Moderate significance.

Operation

- 8.339 During operation of the site there would be no particular further effects on terrestrial invertebrates outside the operational areas of the site and thus the impacts are limited to the area affected by the land take for the scheme. The effects would thus be of negligible magnitude and Negligible significance.

Restoration

- 8.340 Restoration of the site would reinstate vegetation of similar character to that which currently exists across the site, other than in the north where there would be extensive woodland planting linked by a network of hedgerows. This would provide a new habitat for invertebrates which is currently limited in extent within the site and would be expected to increase the species diversity. However, south of Rhaslas Pond the time taken for the recovery of the full functionality of the ecosystems established and the loss of complexity means that the full range and size of invertebrate populations may not recover for a considerable time after restoration. The effects of restoration on invertebrates compared to the current baseline are assessed overall as being of low magnitude and of Minor adverse significance.

Dragonflies and damselflies

- 8.341 Fourteen species of Odonata were identified as occurring, or having occurred, within the Nant Llesg survey area boundary.
- 8.342 The greatest diversity and abundance of Odonata were found to occur in those parts of the survey area adjacent to Rhaslas Pond, between Rhaslas Pond and the minor South Tunnel Road to the south, and to the south of the road.

Land Take

- 8.343 Much of the habitat of most value to Odonata, including the scarce blue-tailed damselfly south of Rhaslas Pond, would be lost to the development of the site. Whilst a number of ponds suitable for breeding would be retained around the margin of the site, and additional ponds created for amphibians would also be of value to Odonata, the extensive wetland areas which provide foraging habitat for the adult insects would be lost. The effects of land take are thus assessed as being of high magnitude and as the overall Odonata community is assessed as of County Borough importance the significance is assessed as Moderate adverse.

Operation

- 8.344 During the operation of the site there would be no particular further effects on Odonata outside the operational areas of the site and thus the area already affected by the land take for the scheme. The effects would thus be of negligible magnitude and Negligible significance.

Restoration

- 8.345 Restoration of the site would reinstate vegetation of similar character to that which currently exists across the site. Additional ponds would be established which would provide new breeding sites for Odonata, in addition to the ponds which would have been established early in the scheme. The area of most potential for Odonata would be the area to be restored to wet heath and marsh south of Rhaslas Pond. The time taken for the recovery of the full functionality of the ecosystems established and the loss of complexity means that the full range and size of the Odonata populations may not recover for a considerable time after restoration. The effects of restoration on Odonata compared to the current baseline are assessed overall as being of low magnitude and of Minor adverse significance.

Aquatic invertebrates

- 8.346 None of the species recorded were of particular nature conservation significance.
- 8.347 The centre-west of the study area was dominated by Rhaslas Pond with smaller ponds linked to it. Habitat was depositing and macro-invertebrates were generally adapted to exploit the detritus and decomposing material associated with quiescent conditions.
- 8.348 The macro-invertebrates of ponds in the north-east of the study area were adapted to exploit detritus and decomposing material associated with quiescent conditions and included molluscs, various haliplid and dytiscid beetles, as well as water boatmen, chironomid larvae and the water hog louse. In addition, various insects had established populations but none was of particular national or local conservation importance. These included the widespread and locally common hawker dragonfly, damsel flies (blue tailed damsel and red damsel) as well as Baetid mayflies and Leuctrid (needle or willow flies) stoneflies.
- 8.349 Ponds and streams in the west of the study area lay inside the western boundary between the north-west corner of Rhaslas Pond and the south-west corner of the site.
- 8.350 In the ponds in the north-west of the area, fauna was limited and comprised species adapted to exploit the detritus and quiescent, decomposing conditions.
- 8.351 With the exception of Rhaslas Pond, Pond 18 in the south-east of the study area was larger than other ponds in the study area and was stocked with coarse fish. It dominated the area. Two streams drained the area and flowed in a generally easterly direction. The pond habitat supported a limited fauna comprising macro-invertebrates adapted to exploit the detritus and decomposing material associated with quiescent conditions.

Land Take

- 8.352 Development of the site would result in the partial infilling of Rhaslas Pond and loss of small ponds in the centre of the site, but many ponds, particularly in the west and south east of the site would be retained. All watercourses within the site would have their headwaters cut off and drainage would be via the site drainage system and water treatment areas.
- 8.353 Additional ponds created for amphibians would develop as suitable habitat for aquatic invertebrates and would provide mitigation for the loss of ponds relatively quickly.
- 8.354 The effects of land take on aquatic invertebrates are thus assessed as medium magnitude on a feature of community importance and thus of Minor significance.

Operation

- 8.355 During the operation of the site, measures taken to attenuate flows and control pollution for the site described in Chapter 11 (hydrology and drainage) would ensure that there were no significant adverse effects on downstream watercourses. Works undertaken to reduce erosion on Fochriw Tip described in Appendix MA/NL/PA/A008 would have beneficial effects on the pond in Parc Cwm Darran downstream of the site. Overall the effects of operation of the site on aquatic invertebrates are assessed as being of negligible magnitude and Negligible significance.

Restoration

- 8.356 Restoration of the site would provide additional ponds which would provide new habitat for aquatic invertebrates and new surface watercourses would be established to provide drainage for the site which would provide new habitat for communities associated with flowing water. New aquatic habitats would be expected to establish relatively quickly. The effects of restoration on aquatic invertebrates compared to the current baseline are assessed overall as being of negligible magnitude and Negligible significance.

Fish

- 8.357 Rhaslas Pond supported a very low density, species poor fish community dominated by Perch with Pike, supported by cyprinids, Common Bream and Roach.
- 8.358 Fish were recorded in two streams. Brown trout was recorded in a stream which ultimately connects to the River Rhydney and 3-spined sticklebacks were recorded in a stream which is the outflow of a fishing pond just outside the south east corner of the site. The streams do not provide suitable spawning grounds for brown trout.

Land Take

- 8.359 Development of the site would result in the partial infilling of Rhaslas Pond and all watercourses within the site would have their headwaters cut off. Drainage would be via the site drainage system and water treatment areas. The fishing pond reservoir just outside the south east of the site which supports fish would not be affected.
- 8.360 Other ponds which would be retained and those created in the early stages of the scheme for amphibians generally do not and would not provide good habitat for fish, which in any event would be discouraged to prevent predation of amphibians.
- 8.361 The effects of land take on fish are thus assessed as of high magnitude on a feature of community importance and thus of Minor significance.

Operation

- 8.362 During the operation of the site, measures taken to attenuate flows and control pollution for the site described in Chapter 11 would ensure that there were no significant adverse effects on downstream watercourses. The overall flows in downstream watercourses should not be

significantly reduced although there could be some reduction of flows in headwaters during dry weather. Works undertaken to reduce erosion on Fochriw Tip described in Appendix MA/NL/PA/A008 would have beneficial effects by reducing erosion of tip material into the Nant Bargod Rhymni and its deposit in the pond in Parc Cwm Darran downstream of the site.

- 8.363 As explained in Chapter 10 Hydrogeology, water quality in the River Rhymney south of the Rhymney culvert would be expected to improve as a result of the interruption of the Rhaslas drain within the void and the diversion of water from it to water treatment areas prior to discharge into the River Rhymney. This improvement in water quality and hence the ecology of the watercourse should be of benefit to fish.
- 8.364 Overall the effects of operation of the site on fish are assessed as Minor Beneficial.

Restoration

- 8.365 Restoration of the site would include reinstatement of part of Rhaslas Pond and new surface watercourses would be established to provide drainage for the site which would provide new habitat for fish. Additional ponds would be created but fish would not be encouraged in the smaller of these so as to avoid predation on amphibians. However some of the larger ponds created from water treatment areas may be colonised by fish populations. As explained in Chapter 10 Hydrogeology, there would be a benefit to water quality in the River Rhymney downstream of the Nant Llesg site as the project would remove a proportion of the coal seams and old workings, the drainage from which is affecting the quality of the river. There would also be a reduction in silting of the lake in Parc Cwm Darran.
- 8.366 Overall the effects of restoration on fish compared to the current baseline are assessed as Minor Beneficial.

Summary of Impacts

- 8.367 Table 8.8 below summarises the ecological effects of the proposed development. The majority of effects would be of negligible or minor significance.
- 8.368 Exceptions as a result of the land take of the project would be an impact of major significance on breeding birds (in particular the loss of the nesting area for two pairs of Little Ringed Plover). There would be impacts of moderate significance on non-statutory designated sites (loss of much of the Cefn Gelligaer SINC), habitat loss (particularly wet heath, unimproved acid grassland and marshy grassland), wintering/passage birds (especially those associated with Rhaslas Pond), terrestrial invertebrates (including grayling and small heath butterflies and broom moth) and dragonflies and damselflies (including the scarce blue-tailed damselfly).
- 8.369 During operation of the site no adverse effects would be of greater than minor significance. There would be beneficial effects on fish and potentially on amphibians and bats as a result of habitat creation, and to otter as a result of improvements to downstream water quality.

Comparing the restored site with the baseline, the majority of effects would be of negligible or minor significance. There would be potential moderate adverse effects on non-statutory sites (Cefn Gelligaer SINC) and habitats (in particular wet heath), breeding and wintering/passage birds (as a result of uncertainties regarding the effectiveness and timescale of habitat restoration). There could be beneficial effects on reptiles, bats otter as a result of habitat creation, and fish and potentially otter through long term benefits to downstream water quality.

Table 8.8 Summary of the Significance of Ecological Impacts

Feature	Land take	Additional Effects During Operation	Restoration
Statutory Designated Sites	Negligible	Negligible	Negligible
Non-Statutory designated sites	Moderate adverse	Minor adverse	Moderate adverse (potentially Negligible)
Habitats	Moderate adverse	Negligible	Minor/Moderate adverse
Amphibians	Minor adverse	Negligible (potentially Beneficial)	Minor beneficial
Reptiles	Minor adverse	Negligible	Negligible (potentially Beneficial)
Bats	Minor adverse	Negligible (potentially Beneficial)	Negligible (potentially Beneficial)
Otter	Minor adverse	Negligible (potentially Beneficial)	Negligible (potentially Beneficial)
Breeding birds	Major adverse	Minor adverse	Moderate adverse

Feature	Land take	Additional Effects During Operation	Restoration
Wintering/passage birds	Moderate adverse	Minor adverse	Moderate adverse
Terrestrial invertebrates	Moderate adverse	Negligible	Minor adverse
Dragonflies and damselflies	Moderate adverse	Negligible	Minor adverse
Aquatic invertebrates	Minor adverse	Negligible	Negligible
Fish	Minor adverse	Minor beneficial	Minor beneficial

Cumulative Impacts

- 8.370 These are impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions considered in combination with the project. To the extent that past projects have been implemented and the effects have occurred then these form part of the baseline of the assessment. However, where such projects are still operational, then it is reasonable to consider the continuing cumulative operational effects with this development .
- 8.371 The following projects have been identified in the area for which the cumulative effects with the development should be considered:
- Ffos y Fran Land Reclamation Scheme;
 - Cwmbargoed Disposal Point outside the Application Area
 - Trecatti Landfill Site; and
 - Net Wood Pellet Facility.

Ffos y fran Land Reclamation Scheme.

- 8.372 The Ffos y fran Land Reclamation Scheme is operated by Miller Argent (South Wales) Limited and is the third and final phase of the East Merthyr Reclamation Scheme and was granted planning consent in April 2005. The Ffos-y-fran Land Reclamation Scheme is the largest of the original three phases and will restore 367ha of derelict land. Works on site commenced in June 2007 and will continue until approximately 2024.
- 8.373 Most of the land take associated with the development has taken place, in particular the stripping of topsoil and subsoil and placement in stores, and the construction of the three overburden mounds for use in restoration. Prior to commencement of the operations, the great crested newt population at the site was captured and translocated to newly constructed ponds at Cwm Golau to the south of the site and a viable population of the species has been maintained. As part of the continuing operations at the site, habitat has been provided for lapwings to nest although this has had limited success to date.
- 8.374 The principal aim of the Ffos-y-fran Land Reclamation Scheme is to progressively restore the land to its former use as common and agricultural land. The operations at the site have reached the stage where overburden removal is being progressively backfilled behind the current workings, into the previously worked out void although some material is still being placed on the southern overburden mound. The two overburden mounds in the north of the site, the easternmost one of which is some 500m from the proposed operational boundary of the Nant Llesg mine, have been completed and seeded to grass. They will remain in place until the overburden is placed in the final void at the end of operations.
- 8.375 Thus the current operations at the Ffos y fran Land Reclamation Scheme are at a considerable distance from the Nant Llesg site beyond the grassed overburden mounds. The exception is the transport of coal from the excavation to the Cwmbargoed Disposal Point which is, in part, included within the site boundary for this development proposal.
- 8.376 Given the distance of the main operations of the Ffos y fran Land Reclamation Scheme from the Nant Llesg site there would be little cumulative impact in terms of ecology and nature conservation as a result of the ongoing operations.
- 8.377 Once restored, all urban common land within the planning application site boundary at the Ffos y fran land Reclamation Scheme will be restored to urban common. The remainder of the land within the planning application site boundary will be restored predominantly to agricultural land with certain areas protected for nature conservation, archaeological or local heritage interests.

- 8.378 A network of watercourses and drainage channels with small water features will be incorporated throughout the restored area of the Ffos y fran Land Reclamation Scheme for watering grazing stock, to recreate certain habitats and to complement the existing adjacent free drainage system, which is of archaeological significance.
- 8.379 Other notable ecological features in the Ffos y fran Land Reclamation Scheme such as the acid grassland over the north eastern sector; certain water features that provide habitats and support for various fauna; certain hedgerows and nesting sites; which have been disturbed or displaced during site operations will be reinstated during the restoration period and managed for a period of five years to re-establish their integrity in the landscape.
- 8.380 As the Ffos y fran Land Reclamation Scheme site is restored, there will be a progressive increase in the ecological value of the site. To the extent that there would be cumulative impacts with Nant Llesg, they would be positive. The only exception would be during the period when the easternmost of the Ffos y fran Land Reclamation Scheme overburden mounds is removed when there would be potential for a cumulative impact of noise and disturbance in the area of the Tair Carreg Moor SINC which lies between the two sites. The site is designated primarily for its vegetation and dragonfly populations, and secondarily for its ponds and ditches. None of these features would be susceptible to noise disturbance and there are therefore no significant cumulative impacts from the Ffos y fran Land Reclamation Scheme.

Cwmbargoed Disposal Point outside the Application Area

- 8.381 The major part of the Cwmbargoed Disposal Point is included in the Nant Llesg planning application boundary. However two sections (one in the north west and one in the south) which lie within Merthyr Tydfil County Borough are excluded. The area in the north-west includes an area of undisturbed open marshy grassland that does not form, part of the operational area of the disposal point and lies beyond its fenced boundary. Within the part that does fall within the disposal point's fenced boundary and which does form a part of the operational area there is little operational activity apart from the passage of coal lorries and other site traffic between the disposal point and the Ffos y fran Land Reclamation Scheme via the Bogey Road crossing point. A short length of the railway siding passes through the southern extremity of this area. All trains entering and leaving the disposal point will pass over this short length of siding.
- 8.382 The southern area includes part of the disposal point water treatment area. To the east of this there is a coal stocking ground which would be used for stocking Ffos y fran Land Reclamation Scheme coal.
- 8.383 To the extent that the activities within these areas are already part of the operation of the site, and would not change as a result of the Nant Llesg Scheme, and in that they are already active and have been taken into account in the baseline, there would be no significant cumulative effects of the Nant Llesg scheme with the operations in this area of the Cwmbargoed Disposal Point which lies outside the Nant Llesg Planning Application boundary.

Trecatti Landfill Site

- 8.384 The Trecatti Landfill Site is operated by Biffa and is located to the north west of the proposed development on the opposite side of the Fochriw Road. The closest part of the operation to the proposed development is the site entrance and access road, which is only 16 metres away from the site boundary. However, the void which is being infilled is some 320m further into the site. There are treatment facilities for leachate to the east of the void. The projected operational life of the Trecatti site is likely to be a further 25 years or more and thus there is likely to be little change in the overall nature of the operations at the site over that period. This would extend beyond the operational period of the Nant Llesg development proposal.
- 8.385 Given the nature of the operations at the Trecatti Site there would be little cumulative impact with the Nant Llesg development other than that the large flock of gulls which feed at the Trecatti landfill currently roost regularly on Rhaslas Pond. This has adverse effects on the ecology of the pond by displacing other species and potentially results in nutrient enrichment of

the water. Loss of Rhaslas Pond would mean that these gulls would probably move to another water body in the area where they would have similar adverse effects.

Net Wood Pellet Facility, Rhymney

- 8.386 Planning permission was granted to NET Energy Group Ltd on 6th December 2012 to build and operate a wood pellet production plant with associated ancillary services (Combined Heat and Power (CHP) plant) involving timber delivery, handling and storage, wood processing, de-barking and chipping, woodchip storage, pellet production, wet milling, drying, dry milling, pelletising, pellet bagging (optional) and pellet loading at Capital Valley Eco Park in Rhymney. The site is some 60m to the east of the boundary of the Nant Llesg site and some 540m to the south east of the operational area.
- 8.387 The project will be a fully integrated facility capable of producing 39,000 tonnes of wood pellets per year. A total incoming feedstock of approximately 97,000 tonnes per year will be delivered to the site predominantly in the form of logs, but also woodchip and forestry brash, from nearby sustainably managed and harvested forests in the Brecon Beacons National Park Forest Area. The logs will first be de-barked, then chipped to produce domestic (premium) and industrial grade pellets. The heat and electrical power requirements to operate the pellet plant will be supplied by a CHP plant fuelled by clean biomass (bark and woodchip).
- 8.388 The flue gas from the combustion process will first pass through multi-cyclones, before passing through bag filters/Electrostatic Precipitators (ESPs). Ash collected from the cyclone will be mixed with bottom ash and conveyed to the enclosed container located outside of the building. After passing through the multi-cyclones the flue gas will pass through an electro-static precipitator for the removal of fine particulates. Bottom ash can be a valuable fertiliser and will be used as a part of sustainable forestry operations. Fly ash will be treated as a hazardous waste and disposed of accordingly to a licensed hazardous waste disposal facility.
- 8.389 Planning conditions require that a methodology for capture and translocation of reptiles from the site be agreed and implemented and that demolition or site/vegetation clearance is not to take place during the bird breeding season.
- 8.390 Given the nature of the operation, the requirement for translocation of reptiles and the control of emissions, there is no potential for significant cumulative effects on ecology and nature conservation as a result of the operation of the wood pellet facility with the Nant Llesg project.

Potential Temporary Common Land

- 8.391 As explained in Chapter 3 The Nant Llesg Project of this ES some 338 ha of the planning application site forms part of the Gelligaer and Merthyr Common. The proposals include the provision of alternative land for stock grazing by the commoners and for access by members of the public, in order to mitigate the impact on the common land from the development proposals. A number of areas have been identified which have potential to be provided for these uses and these are shown on Drawing MA/NL/PA/035. In this section the potential ecological impacts of use of these areas as common land are considered. In each case the ecological characteristics of each area is first described before the potential effects are considered.

Area 6 - Land adjacent to Heads of The Valleys Industrial Estate

- 8.392 This area would be subject to early remediation of mine shafts and adits and then would not be available until the end of the Nant Llesg operations some 19 years after commencement. The Restoration Strategy for the project includes a significant amount of work in this area, including restoration to an enclosed landscape of fields bounded by hedgerows. It would be part of an operational farm and would thus not be suitable for common grazing or unrestricted public access.

Area 7 – Land west of Pontlottyn

- 8.393 This is a predominantly north facing parcel of land crossed by a minor road and largely comprises improved grassland. A field in the east of the site is steeper and less improved. Sedges, rushes and thistles occur more frequently within this field, and heather and gorse occur in a small section of the north-east corner. Anthills were also present in this field and the eastern boundary of the field is dominated by bracken. A section of field in the north of the site contains scattered hawthorns.
- 8.394 A mature larch plantation occupies a steeply sloping section in the south of the site. Mature broadleaved trees line two field boundaries in the east of the site and there are two young trees in one field. A line of eight pollarded beech trees which are in poor condition with cracks, holes and signs of decay line a field boundary. Three mature beech tree pollards are present in the eastern corner of the site. A sessile oak tree and three dead trees (one of which had a number of holes) were present along the northern boundary in the east of the site.
- 8.395 Defunct hedgerows comprising tall and gappy hawthorn line the road which crosses through the middle of the site. Silver birch, rose, blackthorn and ash were also present.
- 8.396 This land would be available for public access for the duration of the project but not for grazing. Given the largely agriculturally improved nature of the land, its use for informal recreation by the public would have no significant ecological impacts.

Area 8 – Land South of Rhymney

- 8.397 The south of this north east facing parcel is composed of gently sloping improved grassland fields. In the north of the site the land drops steeply to the road to the east. Apparently natural cliffs occur and the steep slopes below comprised dense bracken with scattered grassland and heather between. A disused sandstone quarry was present below one section of cliff. Rocky outcrops also occur frequently within the areas of bracken.
- 8.398 As the gradient reduces the bracken becomes patchy and semi-improved grassland occurs in the open areas. Some acid tolerant plants were present including heath bedstraw and foxglove.
- 8.399 The areas along the northern eastern boundary at the bottom of the slope, and the areas in the north-west of the site comprised semi-improved grassland with bracken only occurring in small patches. Areas of grassland in the east of the site were very wet and small patches of marshy grassland occurred. Scattered, mature, broadleaved trees occur within the grassland including sessile oak and silver birch.
- 8.400 There is a fast flowing, small, rocky stream in the east of the site with a small area of broadleaved woodland around it comprising sessile oak, silver birch and alder.
- 8.401 Dry stone walls form the field boundaries in the south of the site. Some are intact but the majority comprised low piles of stone.
- 8.402 There is a pond in the south-east corner of the site. At the time of inspection the water in the pond was turbid and no aquatic vegetation was present. Occasional clumps of rush occurred along the edges. Short, improved grassland surrounds the pond and poaching by sheep was evident around the margins.
- 8.403 This land would be available for public access for the duration of the project but not for grazing. The agriculturally improved nature of much of the land means that its use for informal recreation by the public would have no significant ecological impacts. However, the area of woodland around the stream is ecologically sensitive and this area would be fenced out of the access area.

Area 9 - Area of land south of the Ffos-y-Fran Land Reclamation Scheme alongside the Bargod Taf.

- 8.404 This parcel has a south westerly aspect and occupies a narrow strip of land between a minor road and the Bargod Taf watercourse. The ground slopes steeply to the Bargod Taf and comprises lightly grazed grassland. Rushes occur frequently in the wet grassland and scattered bracken occurs occasionally.
- 8.405 The Bargod Taf lines the southern boundary. It is a fast flowing, rocky stream with steep, vertical, earth banks in places. Scattered trees and shrubs, including ash, hazel, holly and hawthorn occur beside the stream at the eastern end. There is also a tall hedge comprising hazel and ash and a remnant stone wall in the south-east corner of the site beside the road, and an area of conifer plantation.
- 8.406 This land would be available for public access and grazing. Its appropriate use for grazing and informal recreation by the public would have no significant ecological impacts. Areas of wetter grassland bordering the Bargod Taf would be less attractive for recreation, and use is likely to be self-limiting.

Areas 10a and 10b - Land to the south of the Ffos-y-fran Land Reclamation Scheme - part of the Bryn Caerau Farm.

- 8.407 These areas to the west and north respectively of Bryn Caerau Farm comprise predominantly relatively large fields of improved grassland enclosed by fences, hedges/tree lines and walls although many of these features are defunct.
- 8.408 Should this land be made available for public access and grazing, the agriculturally improved nature of much of the land means that its use for grazing and for informal recreation by the public would have no significant ecological impacts.
- 8.409 A further large area of Bryn Caerau Farm is proposed for ecological compensation as described later in this chapter.

Area 11 - Land at Gilfach yr Encil & Glinmil

- 8.410 The site is located on a west facing slope. The eastern half of the site is gently sloping and comprises improved grassland. At the time of inspection it was being grazed by sheep. The western half of the site slopes more steeply and comprises grassland which appears less improved and less frequently grazed, and contains anthills. Scattered bracken is abundant across the grassland and becomes dominant along the western boundary.
- 8.411 The majority of the field boundaries shown on the OS map are marked by low earth banks with occasional scattered broad-leaved trees and scrub. A number of the trees were mature and included sessile oak, ash and sycamore. Dry streams/ditches were also present along two former field boundaries.
- 8.412 A dry stone wall lined the eastern boundary of the parcel and the remnants of dry stone walls which had formed buildings were present in the south of the site.
- 8.413 This land would be available for public access and for grazing. The agriculturally improved nature of much of the land means that its use for grazing and informal recreation by the public would have no significant ecological impacts. The areas of less improved grassland similarly would not be likely to suffer significant adverse impacts.

Area 12 - Land at Pendducae Fawr Farm

- 8.414 The site is predominantly north-east facing crossing over the crest of the ridge with parts of the west of the site being west facing. The majority of the site is gently sloping and comprises improved grassland fields grazed by sheep and cattle. Dry stone walls, mature tree lines, scattered scrub and hedges form the field boundaries.
- 8.415 Steeper sloping banks along the eastern and western boundaries comprise dense or scattered bracken and scattered scrub and trees. An area in the west of the site contained gorse, scattered bracken and occasional heather and has elements of dry heath. An area in the east was dominated by bracken with frequent small groups or lines of mature broad-leaved trees, and scattered scrub.
- 8.416 A line of mature broadleaved trees formed part of the eastern boundary of the parcel where it bordered the Bargod Taf.
- 8.417 This land would be available for public access and for grazing. The agriculturally improved nature of much of the land means that its use for grazing and informal recreation by the public would have no significant ecological impacts. The area of acid grassland/dry heath mosaic would be fenced out of the grazing area although public access would be allowed. This public access would have no significant ecological effects.

Area 13 - Land adjacent to Heads of The Valleys Industrial Estate in ownership of Miller Argent.

- 8.418 This area is within the operational area of the Nant Llesg project and would not be available until some 19 years after commencement of the scheme. The Restoration Strategy for this area includes agricultural fields enclosed by hedgerows and stone walls together with areas of woodland. It would form part of a farm and would thus not be suitable for unrestricted public access. There would be managed public access across the area and this, together with grazing, would have no adverse ecological effects.

Area 14 - Land currently part of waste facility in old railway cutting.

- 8.419 Area 14 would not be available until operations at Nant Llesg had ceased and therefore the assessment is based on the landscape restored in accordance with the Restoration Strategy. It would be made available for grazing and for public access and it would be offered as additional permanent common land.
- 8.420 Following restoration this area would run through the part of the site which would be restored to wet heathland. The line of the old railway would be restored as a dry route through this area which would provide a good facility for viewing the wet heath area. Although access to the wet heath area would not be restricted, the dry route would help to manage access and reducing trampling. It would tend to reduce the potential disturbance effects of open access to this area which would potentially affect breeding and wintering birds. Given the extensive areas involved and the likely relatively low level of use, this is unlikely to be a significant problem.

Bryn Caerau Biodiversity Compensation Area

- 8.421 The assessment of the ecological impacts of the Nant Llesg proposals set out in this chapter concludes that the majority of effects would be of negligible or minor significance. Exceptions as a result of the land take of the project would be an impact of major significance on breeding birds (particularly little ringed plover). There would also be impacts of moderate significance on non-statutory designated sites (Cefn Gelligaer SINIC), habitat loss (particularly wet heath), wintering/passage birds, terrestrial invertebrates and dragonflies and damselflies.
- 8.422 The nature of the proposed development means that it is not possible to fully mitigate these effects within the site boundary. In order to off-set these effects it is proposed to implement ecological enhancements in an area to the south west of the site. The land to be used is part of the holding known as Bryn Caerau Farm which is owned by Miller Argent (South Wales) Limited

- and farmed by tenants, the location of which is shown on the plan at Drawing MA/NL/ES/08/008.
- 8.423 The land lies along the valley of the Bargod Taf around Bryn Caerau Farm. It extends southwards to the disused property of Begwns and northwards to the boundary of land forming part of the Ffos y Fran Land Reclamation Scheme. The eastern boundary extends to a mineral railway leading to the Cwmbargoed Disposal Point to the north and the western boundary extends to the boundary of Merthyr Common and further areas of farmland.
- 8.424 Much of the area is steeply sloping with more gently undulating areas at the top of slopes in the north and west. The more gently sloping areas have been subject to agricultural improvement to enhance them for grazing livestock and are enclosed by defunct hedgerows/tree lines and fences, and occasionally by stone walls. The steeper areas have been subject to lower levels of improvement and include areas of mature woodland. Some farm buildings are also present at Bryn Caerau. Land in the valley of the Nant Gyrawd adjoining to the north east forms the Cwm Golau Ecological Area associated with the Ffos y Fran Land Reclamation Scheme.
- 8.425 As shown on Drawing MA/NL/ES/08/002 a significant area within the Bryn Caerau land is designated as part of the Cwm Bargoed SINC or identified as part of the Afon Bargoed Taf candidate SINC.
- 8.426 The Cwm Bargoed SINC is a very large and diverse system of semi-upland 'ffridd' (valleyside) and valley-bottom habitats associated with the the Afon Bargod Taf. The SINC information describes a complex mosaic of semi-natural habitats including ancient semi-natural woodland, bracken slopes with scattered trees and scrub, marshy grassland, wet and dry heathland, acid grassland, swamp and acid flush. Several ponds are also present. The site supports small pearl-bordered fritillary and grayling butterflies, along with several scarce dragonfly and moth species. Otter ranges along the Bargod Taf, and the site is important for birds including cuckoo, pied flycatcher, wood warbler, whinchat and dipper.
- 8.427 The Afon Bargoed Taf candidate SINC covers all sections of the Bargoed Taf and Nant Bargoed which do not fall into other candidate SINC's along the route. The cSINC information refers to adjacent bankside habitats, particularly semi-natural woodland (mostly dominated by alder) along with areas of semi-improved neutral grasslands, bracken slopes and swamp. Large mature trees are frequent along the banks, and these may support roosting bats. Otter occurs along the Bargod Taf, which is also important for a range of birds of interest, including kingfisher, grey wagtail, dipper and spotted flycatcher. Great crested newt is recorded in the floodplain at Bryn Caerau.
- 8.428 The land at Bryn Caerau thus already contains a variety of habitats of value and supports protected and notable flora and fauna. However, there are a number of opportunities available to enhance the overall ecological value of the area by making changes to how the habitats present are managed and by creating new habitats.
- 8.429 The proposals for this land are set out in the Habitat Enhancement Plan at Appendix MA/NL/ES/A08/015, summarised below, and shown in the plan at Drawing MA/NL/ES/08/009.
- 8.430 The management proposals would enhance the ecological value of the main habitats of interest in Cwm Golau, and in turn the areas identified as SINC, these being:
- Woodland;
 - Grassland;
 - Marshy grassland;
 - Swamp;
 - Ponds;

- Hedgerows; and
- Dry stone walls and derelict buildings

Woodland

8.431 The area currently contains a number of areas of woodland which are predominantly mature and likely to be Ancient Woodland. The enhancement measures proposed would enhance the ecological value of the existing areas of woodland, increase connectivity between woodland and provide new areas of woodland. The proposals include:

- control of grazing;
- tree thinning;
- retaining dead wood; and
- additional woodland planting.

Grassland

8.432 There are several areas of unimproved and semi-improved acid grassland and small areas of semi-improved neutral grassland which show greater species diversity than the larger areas of improved grassland in the area. There are opportunities to enhance and extend these habitats through management to increase the diversity of the flora, provide improved conditions for grassland fungi and for a wider range of invertebrates. The proposals for these grasslands include:

- cessation of fertilizer application and other agricultural improvements such as applying lime or marl and re-seeding;
- control of grazing;
- late cutting (if required); and
- bracken clearance.

Marshy grassland

8.433 The marshy grassland is one of the habitats of most value in the area and was found to support flora of conservation interest including (bog asphodel, ivy-leaved bellflower and soft-leaved sedge. Many of the existing areas are dominated by purple moor grass and rush and would benefit from active management to allow a greater diversity of species to grow. Maintenance of a variety of sward heights is also important as this provides a greater diversity of habitats for invertebrates. Enhancement measures proposed include:

- no new drainage operations to be carried out;
- no existing ditches to be cleared;
- no applications of any fertilisers, marl or lime and no reseeding;
- control of grazing;
- cutting of rushes; and
- removal of scrub.

Swamp

8.434 There is an area of swamp at the bottom of the valley in the south of the area which comprises wet ground and small areas of open water. This area would be cleared and maintained to prevent drying out and succession to scrub and woodland. This management would also encourage additional plant species and provide suitable habitat for breeding birds such as sedge warblers and reed buntings. Enhancement proposals include:

- maintaining high water levels by not creating new ditches or clearing existing ditches;
- control of grazing;
- removal of scrub; and
- rotational cutting of reed beds.

Ponds

8.435 There are currently two areas of standing water within the area and both would benefit from enhancement to improve their ecological value. These are an existing pond at Pwll Glas and a series of silted up ponds at Bryn Caerau Farm. These are approximately a kilometre apart and there is potential to create new ponds in areas of marshy grassland where the water table is high. This will reduce the isolation of the existing ponds and create new wetland habitat. Enhancement proposals include:

- enlarging and deepening existing pond at Pwll Glas;
- re-excavation of silted up ponds near Bryn Caerau Farm;
- creation of new ponds in suitable locations;
- control of grazing of pond margins by fencing and rotation of access to animals;
- removal of aquatic vegetation if ponds become choked; and
- removal of scrub.

Hedgerows

8.436 There are former hedgerows along a number of field boundaries which have now grown into lines of trees and shrubs with gaps between. There is potential for the tree lines to be returned to hedgerows and for additional hedgerows to be planted. This will create new habitats in the area and will provide greater connectivity between areas of woodland. Enhancement proposals include:

- planting hedgerows along existing tree lines to fill gaps;
- planting new hedgerows on field boundaries;
- fencing new hedgerows to protect from grazing livestock; and
- maintenance of new hedgerows to ensure establishment.

Dry stone walls and derelict buildings

- 8.437 There are stretches of dry stone wall along some field boundaries. These are in a poor state of repair and would benefit from being rebuilt and maintained in a favourable condition. There are also some derelict stone buildings with only remnant stone walls in three locations. Bat boxes and nest boxes for barn owls would be installed on the walls of some of these buildings. Care should be taken to not cover existing features which could potentially be used as bat roosts such as deep cracks in masonry and stones.
- 8.438 A disused stone building at Bryn Caerau Farm is in better condition and still retains its roof. This building could be converted into a bat roost subject to confirmation of any existing use by bats.

Summary and Conclusions

Key Findings

- 8.439 As a result of the land take of the project there would be an impact of major significance on breeding birds (in particular the loss of the nesting area for two pairs of little ringed plover, suitable habitat for which would be reinstated on restoration). There would be impacts of moderate significance on non-statutory designated sites (loss of much of the Cefn Gelligaer SINC, although this would be restored on completion of the scheme), habitat loss (particularly wet heath, unimproved acid grassland and marshy grassland), wintering/passage birds (especially those associated with Rhaslas Pond), terrestrial invertebrates (including grayling and small heath butterflies and broom moth), and dragonflies and damselflies (including the scarce blue-tailed damselfly). Suitable habitat for species which currently occur on the site would be reinstated on restoration. Other than for these instances, the remainder of the ecological effects would be of negligible or minor significance.
- 8.440 During operation of the site no additional adverse effects would be of greater than minor significance. There would potentially be beneficial effects on amphibians and bats as a result of habitat creation (and for amphibians, through provision of road crossings), and to otter and fish as a result of improvements to downstream water quality.
- 8.441 Comparing the restored site with the baseline, the majority of effects would be of negligible or minor significance. There would be potential moderate adverse effects on non-statutory sites and habitats, breeding and wintering/passage birds (taking account of the long timescales required for full recovery of the restored areas). There are likely to be beneficial effects on amphibians, reptiles, bats and otter as a result of habitat creation (and for amphibians, provision of road crossings), and on fish as a result of improvements to downstream water quality.

Mitigation

- 8.442 The restoration and aftercare proposals for the site take account of the habitats and species currently present within the site, and seek to re-establish topographical, soil and drainage conditions and management practices which would support these habitats and species. In particular habitats and species included in the Caerphilly Biodiversity Action Plan (BAP) have been taken into account. Local BAPs are intended to focus resources to conserve and enhance biodiversity by taking account of national and local priorities. Thus the restoration and after care proposals include specific measures to reinstate wet dwarf shrub heath in the area south of Rhaslas Pond. New ponds would be created by modifying the water treatment areas used for the development, and elsewhere, and watercourses would be established as part of the drainage of the restored site. A network of hedgerows would be established within the farmland area in the north of site, with new woodland areas here and in the east of the site. The restored site would provide habitat for Caerphilly BAP species such as great crested newt and other amphibians, common lizard, bats, otter, lapwing and a range of other breeding and wintering birds.

- 8.443 The land at the north of the Nant Llesg site which would be restored to enclosed agricultural grazing land would, at the end of the aftercare period, return to the current landowner who would continue to farm the land.
- 8.444 Management of the land at the south of the Nant Llesg site, following the aftercare period, would be the responsibility of the commoners as is currently the case. This would include the area of restored wet heathland as well as extensive areas of restored grassland to the north and east. These grasslands on mineral soils would provide better quality grazing than the wet heathland areas restored on peat, and it is likely that stock would tend to avoid these areas in favour of the better quality grasslands. Thus in all likelihood, overgrazing of the wet heath would not occur as sheep would tend to use the nearby areas of better grazing on mineral soils which would be comparatively more attractive, as is currently the case. However, as is also currently the case, there can be no guarantee that a favourable grazing regime would continue.

Residual Effects

- 8.445 The effects referred to under key findings above are the residual effects of the project taking into account the proposed mitigation. The nature of the proposed development means that it is not possible to fully mitigate the ecological effects of the proposals within the Nant Llesg Site. In order to off-set these effects it is proposed to implement ecological enhancements and management in an area to the south west of Nant Llesg.
- 8.446 The land at Bryn Caerau already contains a variety of habitats of value and supports protected and notable flora and fauna. However, there are a number of opportunities available to enhance the overall ecological value of the area by creating new habitats and by managing both the existing habitats and new habitats created. The land is part of the holding known as Bryn Caerau Farm which is owned by Miller Argent (South Wales) Limited and farmed by tenants. Management of the land at Bryn Caerau would be secured by means of a S106 agreement.

Cumulative Effects

- 8.447 The potential for cumulative effects has been assessed with the Ffos y Fran Land Reclamation Scheme, the Cwmbargoed Disposal Point outside the Application Area, the Trecatti Landfill Site, and the Net Wood Pellet Facility. No potential significant cumulative effects of the Nant Llesg project with these projects on ecology and nature conservation have been identified.

Conclusions

- 8.448 Following completion of the Nant Llesg project, the site itself would have been restored and would be managed by the landowner in the north and the commoners in the south. In addition, the Bryn Caerau offsetting area would have had some 20 years of habitat improvement and management, and an agreement would be in place to ensure that the key habitats would continue to be managed in an appropriate manner. While the wet heath habitats within the Nant Llesg site would take a long time to recover, the likelihood is they would recover in the long term, given the alternative grazing available. It must be acknowledged that there are current threats to the wet heath if grazing pressure is increased and this would also be the case when the site is recovering.
- 8.449 Taking into account the likelihood of the wet heath recovering, the existing and continued threats from overgrazing, and the habitat improvement and management of Bryn Caerau, then the overall balance of biodiversity of the area would be maintained

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Nant Llesg Surface Mine

Incorporating Land Remediation

Chapter 9

Agricultural land use and Soils

Nant Llesg Surface Mine

Incorporating Land Remediation

Environmental Statement

Chapter 9 - Agricultural Land use and Soils

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9 Agricultural Land Use and Soils

Introduction

- 9.1 This chapter, prepared by RPS reports on the assessment of potential environmental effects on agricultural land use and soils arising from the mining operations and land remediation works associated with the 'Nant Llesg Surface Mine, Incorporating Land Remediation' scheme. The chapter will:
- Present the existing environmental baseline established from desk studies and site surveys;
 - Identify the potential environmental effects arising from the Project, based on the information gathered and assessments undertaken;
 - Identify any necessary mitigation measures which could prevent, minimise, reduce, offset or compensate for the possible environmental effects identified during the EIA process.
- 9.2 The chapter considers the likely environmental effects on agricultural land use and soil resources arising from the site enabling, operation (mining), remediation, restoration and aftercare phases of the project. The agricultural land use and soil receptors considered include effects on mineral and peaty soil resources, agricultural land quality, farm holdings and the agricultural use of Merthyr and Gelligaer Common.

Policy and Guidance

National Policy

- 9.3 Current national planning policy in Wales is set out in "Planning Policy Wales", Edition 5 published by the Welsh Assembly Government in November 2012.
- 9.4 Section 4.9 'Conserving the best and most versatile agricultural land' states at 4.9.1 that
- "In the case of agricultural land, land of grades 1, 2 and 3a of the Department for Environment, Food and Rural Affairs (DEFRA) Agricultural Land Classification system (ALC) is the best and most versatile, and should be conserved as a finite resource for the future.*
- In development plan policies and development control decisions considerable weight should be given to protecting such land from development, because of its special importance. Land in grades 1, 2 and 3a should only be developed if there is an overriding need for the development, and either previously developed land or land in lower agricultural grades is unavailable, or available lower grade land has an environmental value recognised by a landscape, wildlife, historic or archaeological designation which outweighs the agricultural considerations. If land in grades 1, 2 or 3a does need to be developed, and there is a choice between sites of different grades, development should be directed to land of the lowest grade.*
- 9.5 PPW is supported by a series of Technical Advice Notes (TANs). TAN 6 'Planning For Sustainable Communities' (2010) is relevant to the agricultural land use and soils topic.
- 9.6 With regard to agricultural land, paragraph 6.1 identifies the Welsh Government's objective for sustainable agriculture as:

“a sustainable and profitable future for farming families and businesses through the production and processing of farm products while safeguarding the environment, animal welfare, adapting to climate change and mitigating its impacts, while contributing to the vitality and prosperity of our rural communities.”

- 9.7 Where development involves agricultural land, paragraph 6.2.1 summarises the agricultural factors to be taken into consideration and it states that

“when preparing development plans and considering planning applications, planning authorities should consider the quality of agricultural land and other agricultural factors and seek to minimise any adverse effects on the environment”

- 9.8 National minerals planning policy is currently set out in Minerals Planning Policy Wales and, in relation to coal, is supported by guidance contained in the Minerals Technic Advice Note 2: Coal (MTAN2) published by the Welsh Assembly Government in January 2009.

- 9.9 Paragraph 94 of MTAN 2 outlines the relevant considerations with regard to agricultural land and states.

“Agricultural land quality is one of a number of sustainability considerations with preference being given to development using land of the poorest quality first, considering also conservation interests. Land of grades 1, 2 and 3a of the Ministry of Agriculture Fisheries and Food Agricultural Land Classification is the best and most versatile land; this is a national resource and should be protected from development unless it will be restored to its original grade. It should only be used for coal development if there is an overriding need, and sufficient land in lower grades is either unavailable or has an environmental value recognised by statutory designation, which outweighs agricultural considerations. Where lower quality agricultural land is taken for opencast workings and reinstated to agriculture then restoration should seek to avoid any irreversible long-term loss in land quality”

- 9.10 The following appendices to MTAN provide good practice guidance which is particularly relevant to this topic:

Appendix Q – Best practice for reclamation

Appendix R – Best practice for soils

Local Policy

- 9.11 The Nant Llesg project predominantly lies within the administrative area of Caerphilly County Borough Council where the development plan comprises the Local Development Plan (LDP) which was adopted in November 2010.

- 9.12 There are no specific policies relating to the protection of agricultural land use or soils in the document. Policy SP10 ‘Conservation of Natural Heritage’ states that:

“The Council will protect, conserve, enhance and manage the natural heritage of the County Borough in the consideration of all development proposals within both the rural and built environment.”

- 9.13 Associated with this planning application is an application to the Welsh Ministers under Section 38 of the Commons Act 2006 for consent to carry out the proposed works on part of the Gelligaer and Merthyr Common (CL38). As a compensatory measure, additional areas of land outside the planning application site area have been identified by Miller Argent for temporary use for public access or for grazing and public access during the lifetime of the project and as an ecological

compensation area. Some of these areas lie within the administrative area of Merthyr Tydfil County Borough Council where the development plan currently comprises the Local Development Plan (LDP) which was adopted in May 2011.

- 9.14 There is no specific policy relating to the protection of agricultural land use or soils in the LDP. The objective of Strategic Policy SO 11 is:

“To ensure the continued protection and enhancement of the natural, cultural, built and historic environment”

- 9.15 TB 8 refers specifically to the development of mineral proposals. Even though none of the proposed surface mining operations lies within the areas of land within the County Borough of Merthyr Tydfil, the policy states:

“Proposals for mineral extraction and associated development will only be allowed where:

1. *They would not result in unacceptable environmental impacts;*
6. *They include acceptable proposals for progressive and final restoration, aftercare and beneficial afteruse.*

Other Technical Guidance

- 9.16 In addition to the National and Local planning policy documents described above, the following guidance has also been used to inform the methodology for assessment of the agricultural land use and soils (including peat resources) and the development of project proposals in relation to the management of soil resources through the different phases of the Project.

- CCW Guidance Note - Assessing the impact of windfarm developments on peatlands in Wales (January 2010). This guidance is designed to indicate to developers the issues/topics that the Countryside Council for Wales (CCW) expects to be covered in windfarm impact assessments. Whilst it is specific to windfarms, the guidance is also relevant to all forms of development that may affect peatland areas as it includes sections on the methodology for assessing peat resources and consideration of appropriate mitigation measures that may be applied to peatland areas.
- Guidance on the assessment of Peat Volumes, reuse of Excavated Peat and minimisation of Waste SEPA/Scottish Renewables, January 2012. This guidance considers the potential waste implications of developments on peat and provides guidance on how peat should be considered through the environmental impact assessment process.
- Guidelines for Peatland Restoration – Peatlands and Uplands Biodiversity Group (Northern Ireland) October 2010. This guidance considers the characteristics of peatland habitats and their potential for restoration or re-creation.
- DEFRA Good practice guide for handling soils (2000). This guidance is designed to assist in the identification of the most appropriate best practice methodologies to be adopted in the stripping, storage and restoration of soils on mineral sites.
- DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. A practical guide to assist anyone involved in the construction industry to protect soil resources.

- DETR (1999) Soil Forming Materials – Their Use in Reclamation. Guidance on the identification and use of soil forming materials in land restoration.

Methodology

- 9.17 This section sets out the methodology, significance criteria and assumptions that will be used during the assessment of effects on agricultural land use and soils.

Study Area

- 9.18 The study area for agricultural land use and soils includes the “main site”, which comprises the area required for the Nant Llesg Surface Mine and the incorporated land remediation, including the coal working extraction area; overburden, soil and peat storage areas, on-site plant areas, staff accommodation and workshop areas; and water storage and treatment areas. This area also includes areas of land where short term remediation works are to be carried out within the first two years of the scheme.
- 9.19 Also included in the study area are “additional areas” of land which lie beyond the boundary of the planning application site area that have been identified for a number of temporary, compensatory land uses, including grazing, informal public recreational use and ecological offsetting.
- 9.20 Figure MA/NL/ES/09/001 identifies the boundary of the main site and the additional areas of land.

Assessment Methodology

Baseline Data Collection

- 9.21 The identification of the existing baseline conditions in relation to agriculture and soils has been undertaken in two stages, comprising a desk top review of available published information and site survey. Both stages have focused on soil types and resources, agricultural land quality, and the local structure of farm holdings, including the use of the Merthyr and Gelligaer Common.

Desk Top Study – Main Site and Additional Areas

- 9.22 The study of published information relevant to the assessment of both the main site and additional areas is based on the following sources:
- British Geological Survey Data (BGS Internet Portal) Scale 1:50,000
 - Soil Survey of England and Wales, National Soil Map Sheet 2 (Wales), 1:250,000 and accompanying Regional Bulletin (1984).
 - Agricultural Land Classification, Provisional Sheet 154 Cardiff
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 - The Met. Office Climatological data for Agricultural Land Classification. (1989)
 - Welsh Government Farming Statistical Data (2010)

Site Survey

Soils and Agricultural Land Quality - Main Site

Soil Survey

9.23 A detailed survey of soil resources and agricultural land quality was carried out on the site between Autumn 2011 and July 2012. This survey included the examination of soil profiles using a 1.2m dutch hand auger at approximately 100m intervals across the area of the main site. In addition, having identified the main soil types across the area during the auger boring survey a further seven soil pits were excavated by using a JCB to confirm the soil characteristics. The location of the auger borings across the site is shown in Figure MA/NL/ES/09/002. A summary of soil types found across the site is provided in Appendix MA/NL/ES/09/001 including photographs of soil pits excavated within the main site, soil types and detailed profile descriptions. The distribution of soil types identified across the site is identified on Figure MA/NL/ES/09/003.

9.24 The survey work included the identification of the following standard soil characteristics:

- Soil horizon depths;
- Soil texture of all horizons;
- Soil colour;
- Stone contents, estimated from augering, confirmed by soil pit excavation
- Presence and characteristics of mottling, a soil wetness indicator;
- Presence of manganese concretions, a soil wetness indicator;
- Identification of gleyed horizons;
- Identification of slowly permeable layers; and
- Identification of impenetrable rock layers.

9.25 In addition, a systematic description was made of the peat at the individual locations where peat was found to be present using the Van Post system. This approach is in accordance with that recommended in Section 4.2 of the CCW guidance note (para 9.18) which says:

“Characterisation of the degree of peat humification according to the Von Post (H1-H10) scheme is more relevant”

9.26 This system comprises a ten point scale to assess the degree of decomposition of peat from H1, undecomposed where plant structures remain unaltered, to H10, completely decomposed, where plant structures are not recognisable and the structure is amorphous.

Agricultural Land Classification

9.27 The methodology employed for determining the quality of agricultural land is known as the Agricultural Land Classification (ALC), which is a system originally devised by the Ministry of Agriculture Fisheries and Food (MAFF - now part of Natural England). The ALC system was introduced in 1966 but has been comprehensively revised and the current guidelines ‘Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land’ were introduced in October 1988.

9.28 The ALC system provides a framework for classifying land according to the extent to which physical characteristics impose long-term limitations on agricultural use. The system is based on the assessment of the following limiting factors:

Climate; accumulated temperature and annual average rainfall;

Site; gradient, micro-relief and flood risk;

Soil; texture, structure, depth and stone content; and

Interaction of the above; soil wetness, droughtiness and liability to erosion.

9.29 These factors impose limitations on the performance of land in terms of the typical cropping range and expected level and consistency of yield. The ALC grade, which ranges from grade 1 (highest quality land) to grade 5 (lowest quality land), is determined according to the severity of the limitations. Grade 3 is further subdivided into subgrades 3a and 3b.

Soils and Agricultural Land Quality – Additional Areas

9.30 The areas, outside the planning application site area and beyond the main site, have been considered in terms of their proposed temporary use for one or a combination of alternative land uses including grazing, ecological offsetting and/or informal public recreational use.

9.31 Whilst these areas of land have been assessed in terms of their soil resources and agricultural land quality, it is not proposed that the soil materials within these areas or their inherent quality would be affected by the proposals. However, a reconnaissance survey of the soils was undertaken within these areas to confirm the nature of the main soil types within the area identified by the published geological and soil survey information so as to assess their suitability for their proposed use.

9.32 As described in Paragraph 9.28 above the soils information that has been obtained from the survey of these areas, which has been combined together with specific site and climatic information to assess the agricultural land quality of these areas.

Farming Framework - Main Site and Additional Areas

9.33 The structure of land ownership and farming of both the main site and additional areas has been further considered through:

- Site visits to look at patterns of agricultural land use; and
- Information provided by Miller Argent and commoners to determine the nature of farming practices within the main site and for the other areas beyond the boundary of the site.

Determining the Significance of effects

9.34 There are no standard criteria for assessing the significance of environmental effects on agricultural land use and soil resources and therefore account has been taken of the guidance that is provided on these topics in the Design Manual for Roads and Bridges (DMRB) Volume 11,

Section 2, Part 5, HA 205/08¹. Although developed for highways projects, the DMRB has methodologies that are also useful for other forms of development.

9.35 In addition, the assessment methodology takes into account the following:

- The requirements of EIA as set out by the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended in Wales) (“the EIA Regulations”), which gives effect to EC Directive 2011/92/EU (codification).
- Welsh Office Circular 11/99 Environmental Impact Assessment.
- Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Impact Assessment, 2004 (IEMA, 2004).
- Generic best practice advice on EIA provided by Minerals Technical Advice Note 2: Coal (January 2009) (MTAN2), Appendix F.

9.36 Based on this guidance, the significance of a potential effect on agricultural land use and soils is assessed as a function of the value or sensitivity of the receptor/s and the magnitude of the impact on that receptor/s.

Determining the Sensitivity of the Receptor

9.37 With respect to value or sensitivity, a level has been assigned to the key receptors in the agricultural assessment: agricultural land quality, soils and the structure of farm holdings. There is no statutory guidance of the assessment of sensitivity for this topic area. The guidelines that have been used to assess this are described in Table 9.1. Where a receptor could be placed within more than one category of value, conservative professional judgement has been applied to determine which category is appropriate.

Table 9.1 – Guidelines for the assessment of sensitivity

Sensitivity	Guidelines for Assignment of Sensitivity
High	Grade 1 “best and most versatile” land Specialised horticultural enterprises Deep peat soils > 50cm deep highly susceptible to damage from disturbance
Medium	Grade 2 and 3a “best and most versatile” land Annual horticultural cropping or intensive arable or livestock enterprises (including dairying) Soils with peaty topsoils, susceptible to damage from disturbance Glastir* scheme agreements Areas of Common Land
Low	Grade 3b lower quality land Arable and grassland areas Soils susceptible to damage due to a wetness limitation
Negligible	Grade 4 and 5 quality land Grassland areas Soils with limited susceptibility to damage

* Glastir – An Agri-environment scheme funded by the Welsh Government to encourage farmers to manage their land in an environmentally sensitive way.

Determining the Magnitude of the change

- 9.38 The magnitude of the impact on agricultural land use and soils has been considered with regard to the key factors in the agricultural assessment, agricultural land quality and the farming framework.
- 9.39 The magnitude of an impact has been categorised as high, medium, low or negligible based on the consideration of the factors in Table 9.2. There is no statutory guidance that can be applied to this topic area.
- 9.40 With regards to the loss of agricultural land quality, guidance from Welsh Government Technical Advisory Note (TAN) 6 (July 2010) provides an assessment framework with regard to the statutory consideration of the loss of the best and most versatile land and identifies that there should be statutory consultation with the Welsh Government (WG) Department for Rural Affairs (DRA) where the proposed development would involve the loss of 20 ha or more of grades 1, 2 or 3a land or a loss which is less than 20ha but is likely to lead to further losses amounting cumulatively to 20ha or more.
- 9.41 Where an effect could be placed within more than one category of magnitude, conservative professional judgement has been applied to determine which category is appropriate.

Table 9.2 – Guidelines for the assessment of magnitude

Magnitude	Guidelines for assessment of Magnitude
High	Loss of >50ha of the “best and most versatile” grade 1, 2 or 3a land. Loss of areas of highly sensitive deep peat resources (>1m deep). Agricultural production affected at a regional level. Full-time farming enterprise/s rendered unworkable.
Medium	Loss of >20ha of the “best and most versatile” grades 1, 2 or 3a land. Loss of areas of sensitive shallow peat resources. Agricultural production affected at a local level. Full-time farming enterprise/s rendered unworkable.
Low	Loss of 5 – 20 ha “best and most versatile” grades 1, 2 or 3a land. Affects the workability of individual farming enterprises, but farming enterprises are not rendered unworkable Loss of less susceptible mineral soil resources
Negligible	Loss of less than 5 ha of the “best and most versatile” grade 1, 2 or 3a land. No adverse effects on farming enterprises or production. Limited loss of soil resources.

Evaluation of the Significance of Effects

- 9.42 The likely environmental effects on agricultural land use and soils will be described and the significance evaluated in accordance with the significance matrix set out in Table 9.3 below:

Table 9.3 Significance Matrix

Magnitude/Scale of Change	Value/Sensitivity			
	High	Medium	Low	Negligible
High	Major	Moderate/Major	Moderate/Minor	Minor
Medium	Moderate/Major	Moderate	Minor/Moderate	Minor/Negligible
Low	Moderate/Minor	Minor/Moderate	Minor	Negligible
Negligible	Minor	Minor/Negligible	Negligible	Negligible

- 9.43 The duration of the effect is indicated where known using the terminology ‘short’, ‘medium’ and ‘permanent’ where the categories are defined as follows:

Temporary - Short term: A period of months, up to one year;

Temporary - Medium term: A period of more than one year, up to five years;

Temporary - Long term: A period of greater than five years but not beyond the lifetime of the project.

Permanent: A period beyond the lifetime of the project.

- 9.44 These levels of significance apply to both adverse and beneficial effects. For the purposes of this assessment those effects identified as being of 'Moderate' or greater significance will be regarded as being significant in EIA terms. Effects of 'Minor' or lesser significance will be identified but are not considered significant in EIA terms.

Consultation

Scoping

- 9.45 The original scoping opinion from Caerphilly County Borough Council (CCBC) in relation to the proposed project was provided in a letter dated 26 August 2011.

- 9.46 In their response to CCBC dated 20 July 2011, the Countryside Council for Wales (CCW) stated, with regard to soils and restoration:

"We note the comments made in relation to a restoration strategy under section 8 of the scoping report. CCW advise that the restoration goals are designed only following survey of the ecological and physical properties of the site such as soil type and water regime, to determine the most appropriate end result."

- 9.47 CCW made the following specific comment with regard to the potential presence of peat on the site:

"the EIA should also consider whether peat is present within the proposal site. If peat is found, information should be provided on condition, depth and extent".

- 9.48 A further scoping opinion was received from Caerphilly County Borough Council on 9th March 2012. In regard to Land Use and Soils, CCW commented that

*"We support the use of recent CCW guidance, *Assessing the Impact of Windfarm developments on Peatlands in Wales* in assessing the peat resource on the site"*

- 9.49 A further scoping opinion was received from Caerphilly County Borough Council on 23rd August 2012. This opinion contained no additional comments relevant to this topic.

Stakeholder Engagement

- 9.50 A number of other consultations have taken place during the pre-application phase of the project and these are listed in the Table 9.4 below:

Table 9.4: Pre-Application Consultations

Organisation	Date of Consultation	Main Topics Discussed
National Resource Wales SEED	21 st February 2013	Soils and Agricultural Land Quality Land Restoration Proposals
CCW	14 th March 2013	Common Land Strategy Land Restoration Strategy
Merthyr and Gelligaer Commoners Association	27 th February 2013	Common Land Strategy

Baseline Environment

Introduction

9.51 This section describes the soil, agricultural land quality and farming characteristics of both the main site and the additional areas of land within the project. The baseline for the main site is described first and includes a description of the relevant desk-top information available for this area and the detailed survey work that has been carried out on this area. This is followed by a description of both the relevant desk top and site survey information for the additional areas of land.

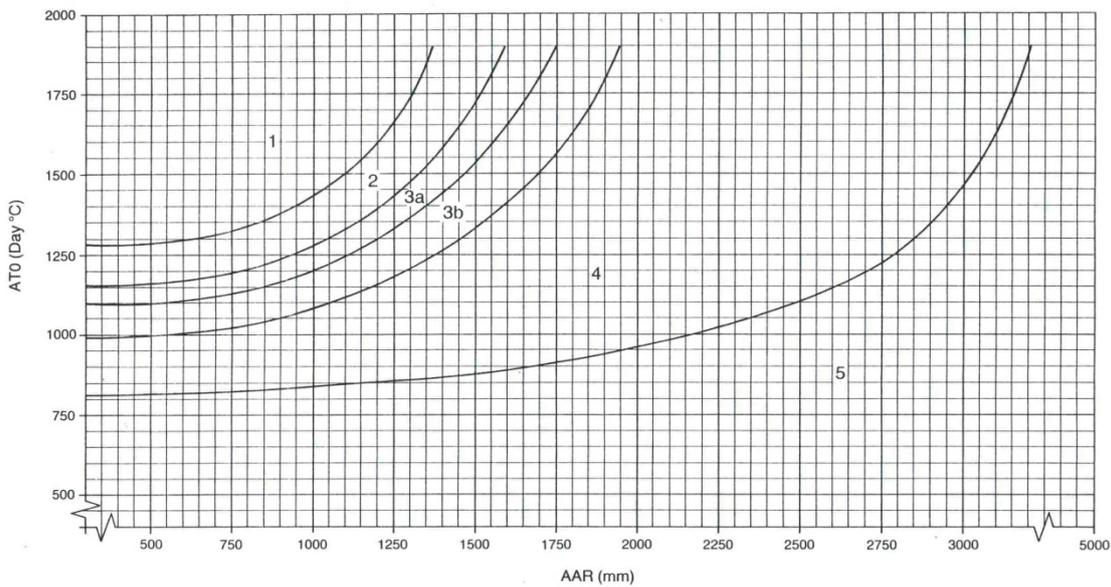
Main Site - Desk Top Information - Location and Topography

- 9.52 The main site lies on the hills to the west of Rhymney, with its northern boundary about 1km south of the Heads of the Valleys Road. The western boundary is the Fochriw Road leading south to Pentwyn and the eastern boundary runs along the western edge of the settlement boundary of Rhymney immediately to the east is the Heads of the Valleys Industrial Estate (See Drawing MA/NL/PA/01).
- 9.53 To the east, west and south of the site, additional areas of land have been included for land remediation works.
- 9.54 Cwmbargoed Disposal Point (CDP) is also included within the site boundary as the reception, processing and dispatch facility for all coal to be mined at the site.
- 9.55 Most of the site consists of open, semi-improved and unimproved grassland, with some improved grassland near the north-west corner. The highest ground is in the west, in the vicinity of the Rhaslas Pond at just over 430m above ordnance datum (aod). Slopes to the north-east, east and south-east from this are relatively gentle but become much steeper along the eastern boundary of the site overlooking Rhymney itself. The lowest land, at around 300m a.o.d., is along the eastern boundary.

Climate

9.56 Climatic data has been obtained from the Meteorological Office's standard 5km grid point data set for three representative points on the site. The data include the Average Annual Rainfall (AAR), a measure of the climatic wetness of a locality and Accumulated Temperature (ATO) between January and June, and a measure of the relative warmth of a locality. These two parameters are used in the Agricultural land Classification (ALC) system to evaluate any overall climatic limitations to agricultural activities. In general a climatic limitation does not begin to apply until AAR is above 750mm or ATO is below 1250 day°C. Thereafter, the higher the rainfall the lower the grading, and the cooler the site (i.e. the lower the ATO) the lower the grading, as shown the Table 9.5 below.

Table 9.5 – ALC Climate Guidelines



9.57 The climatic properties of Field Capacity Duration (FCD) and Moisture Deficit (MD) are used in the assessments of Wetness and Droughtiness respectively. In general, as AAR increases so does FCD, but MD decreases.

9.58 The climatic data for three representative points on the site are as indicated in Table 9.6 below:-

Table 9.6 – Main Site Climate data

Reference Point	SO 091 072	SO 100 075	SO 104 084
Altitude (m)	420	405	320
Average Annual Rainfall AA (mm)	1614	1597	1518

Reference Point	SO 091 072	SO 100 075	SO 104 084
Accumulated Temperature ATO (day degrees)	1067	1083	1179
Moisture Deficit for wheat (mm)	12	14	28
Moisture Deficit for potatoes (mm)	0	0	14
Field Capacity Duration (days)	307	304	293
Maximum ALC Grade	4	4	4

9.59 These data clearly show the effect of altitude. The worst climatic conditions are at the higher altitudes where the rainfall is around 1600mm (about 63 inches) per annum. Here the soils hardly ever dry out i.e. the field capacity duration (307 days) last for most of the year, there is never any risk of drought (zero or very low moisture deficits) and the temperatures are relatively low (ATO not even reaching 1100 day degrees). The lower ground, e.g. at the north-east corner, is only marginally better. However, over the entire site the climatic conditions pose such severe agricultural limitations that the maximum possible ALC Grade is Grade 4, the second lowest grade in the system.

Geology

9.60 According to the 1:50,000 geological map (Sheet 232, Abergavenny) and the British Geological Survey (BGS) Internet Portal Site, the local bedrock consists mainly of Coal Measures mudstones, siltstones and sandstones. These are differentiated into Lower Coal Measures in the north and centre of the site, a narrow band of Middle Coal measures to the south of this and Upper Coal Measures and the Llynfi Beds/Member in approximately the southern third of the site. Thicker bands of sandstone are shown separately notably in the Middle Coal Measures and in the Llynfi Beds/Member in the south. Over most of the site there is no superficial drift recorded but round the edges there are areas of glacial till. No accumulations of peat are shown on the geological maps.

9.61 The maps and BGS portal indicates that much of the northern part of the site has already been disturbed by opencast mining. Local site geology is shown on drawings MA/NL/PA/040-043

9.62 Further detail on the geology of the site is provided in Chapter 14, Blasting and Vibration.

Soils

- 9.63 There is no detailed soil map for the site and so the only source of published information on the soils is from the relevant sheet of the 1:250,000 scale National Soil Map (Sheet 2 Wales). This shows a very simple picture of land disturbed by opencast mining (Soil Association 92c) in the north and apparently undisturbed soils of the Wilcocks 1 Association (721c) in the south. The soils of the Wilcocks Association are formed mainly in glacial till, hence the observation made above that at least a thin covering of glacial till may be more extensive than indicated by the geological map. The distribution of the soil associations on the site is shown on Figure MA/NL/ES/09/004.
- 9.64 The Wilcocks 1 Association is typically found on areas of greyish, stony glacial till (boulder clay) derived from Carboniferous and Lower Palaeozoic Rocks. The soils are severely or permanently waterlogged near the surface (Wetness Class V or VI) due to a combination of high rainfall, impermeable subsoil, gentle relief (i.e. slow runoff) and sometimes inflow of water from adjacent higher ground. The profiles thus show evident signs of waterlogging (gleying) and have peaty topsoils. This organic surface topsoil is acid and typically between 10 and 40cm thick, with underlying grey, strongly mottled clay loam or sandy clay loam subsoils often stained with organic matter from above. Stone content frequently increases with depth. Soil texture can be somewhat variable and different soil series can be recognised on the basis of this. The loamy Wilcocks series per se is usually dominant although in areas over Middle and Lower Coal Measures i.e. on most of the site; there may be a higher proportion of more clayey soils such as the Kielder series.

Agricultural Land Classification

- 9.65 Land quality is conventionally assessed by applying the Agricultural Land Classification (ALC) system. This places land into one of 5 grades, Grade 1 the best, Grade 5 the worst, according to the degree to which its physical characteristics impose long-term limitations on its agricultural use (range of crops, yields, consistency of performance, inputs required, etc). Grade 3 is divided into Subgrades 3a and 3b. The grading is on the basis of physical quality alone, and other less permanent factors such as chemical fertility, current land use, standard and adequacy of fixed equipment, level of management, farm structure and accessibility are not taken into account. It is a classification of land, not just soil, and while information about soil is essential in order to apply it accurately it also takes into account other properties of land such as climate, topography and flood risk.
- 9.66 A series of 1:63,360 maps indicating the perceived distribution of the five basic grades was produced by MAFF during the 1960s and 1970s. The site occurs on Sheets 154 (Cardiff) and is shown as entirely Grade 5 (Very Poor Quality land), no doubt because of the adverse climate, upland soils and low-intensity land-use which these factors produced.
- 9.67 The ALC system was comprehensively revised in 1988 and this system includes more precise guidelines for determining the appropriate gradings.
- 9.68 The effect of the climate on the gradings is taken into account by determining various climatic parameters for a given site by interpolation of a set of basic data held on the Meteorological Office database. Some typical data have already been provided above and the point made that the climate depends very much on the altitude and becomes increasingly severe with altitude as the rainfall increases and the accumulated temperature decreases. None of the site can be graded any higher than Grade 4 because of an overall climatic limitation, though surprisingly the climate per se is not sufficiently adverse to impose an overall Grade 5 classification.

Farming Characteristics

Welsh Government Statistical Data

- 9.69 The latest Published Welsh Agricultural Statistical Report provides data for Wales in Table 9.7 the Welsh Regions for 2011. The 2011 Welsh Statistical survey data provides the following figures for the distribution of agricultural land use in Wales as a whole and the South Wales region.

Table 9.7 – Welsh Regional farming Statistics

Land Use	Area (ha) South Wales	% Area in South Wales	Area (ha) Wales	% Area in Wales
Permanent Pasture	128,021	68	1,044,170	
Rough Grazing	22,005	12	224,170	
New Grassland	13,109	7	116,681	
Crops and Horticulture	25,031	13	89,628	
Total	188,166	100	1,474,649	

- 9.70 The local area figures for Merthyr Tydfil and Caerphilly local authorities for 2011 are as follows in Table 9.8:

Table 9.8 – District Farming Statistics

Land Use	Caerphilly Area (ha)	%	Merthyr Tydfil Area (ha)	%
Permanent Pasture	9,470	76	2,944	69
Rough Grazing	1,744	14	1,166	28
New Grassland	812	7	116	3
Crops and Horticulture	418	3	15	< 0.3% (0)

Land Use	Caerphilly Area (ha)	%	Merthyr Tydfil Area (ha)	%
Total	12442	100	4,241	100

9.71 The figures in Table 9.7 illustrate the dominance of grassland and livestock based farming enterprises throughout South Wales and Wales as a whole. Whilst there is a small proportion of crop production taking place in Caerphilly, as shown in Table 9.8, grassland based enterprises are dominant within both Caerphilly and Merthyr Tydfil. There is also a high proportion of “rough grazing” land with the Merthyr Tydfil area.

Gelligaer and Merthyr Common (CL38)

9.72 The Gelligaer and Merthyr Common as registered under Section 4(2) (a) of the Commons Registration Act 1965 and is comprised of approximately 3090.7ha (7638acres) of land. In 2010 approximately 1.85 ha of the land ceased to be common land, as this area formed part of the land required for the Heads of the Valley Road Scheme. An additional area of approximately 0.20ha ceased to be common land at the Valley Hills filling station, Merthyr in 2010. The area of the Common currently is therefore approximately 3088.65ha.

9.73 The rights granted to the Commoners on the Gelligaer and Merthyr Common include the following types:

- Rights to graze cattle, sheep and horses. Whilst some livestock on the Common are hefted any farmer with rights of common can use any part of the common land. The numbers of grazing sheep and cattle are stipulated for each Commoner. In regard to horse numbers these are slightly differently controlled. Where the rights granted to a Commoner are relatively small, in terms of overall grazing animals, the number of horses that can be grazed is stipulated. However, for Commoners with an overall larger number of livestock grazing the Common, horses can be substituted for cattle, at a ratio of 1 horse/2 cattle and 1 horse/10 sheep, up to a maximum of 25 horses in total.
- Rights to cut fern bales from the Common
- Rights to remove stone from the Common for the maintenance of walls or tracks within the designated farm holding. This right is only granted to a limited number of Commoners.

9.74 A subsidiary of Miller Argent, Ffos y fran (Commoners) Limited, is a registered Commoner and is the largest single Commoner. In total across the whole Common, there are registered rights for approximately 55,000 sheep equivalents and Ffos y fran (Commoners) Limited has acquired properties to which approximately 11,000 equivalent rights attach. However, Miller Argent has a number of agreements in place with the Commoners Association not to exercise Ffos y fran (Commoners) Limited's grazing rights on the Common. It is understood that there are currently a number of active Commoners (approximately 7) in this area, who derive some income from their livestock farming enterprises. This includes the farmer who currently owns and farms the land immediately north of the Common within the main site based at Cwm Carno. The Commoners who actively graze the Common as a part of their livestock farming enterprises use it predominantly for sheep grazing, with smaller numbers of cattle.

Site Survey

Soil Survey – Main Site

Soil Types - General

- 9.75 The site inspection confirmed the broad division of the site into areas with natural soils and areas which had been disturbed to a greater or lesser extent by former coal extraction. The natural soils could be divided into three main categories depending essentially on their dominant textures. The areas affected by former coal extraction could also be divided into three categories depending on the degree of disturbance and the extent to which any restoration work had been carried out.
- 9.76 Thus the accompanying soil map (Figure MA/NL/ES/09/003) and the following description recognises the following:-
- Unit 1 - Clays (Peaty Top)
 - Unit 2 - Loamy over Clayey
 - Unit 3 - Loamy (shallow), including rock outcrops
 - Unit 4 - Restored Surface Mining Area
 - Unit 5 - Restored Surface Mining Area (with Topsoil)
 - Unit 6 - Tips and other surface disturbance
- 9.77 The distribution of these soil types are shown on Figure MA/NL/ES/09/003. Soil Pit description and accompanying photographs examined in the different soil types are contained in Appendix MA/NL/ES/09/001

Unit 1 Natural Soils - Clays (Peaty Top)

- 9.78 They correspond more or less to the Roddlesworth series as recognised by the Soil Survey of England and Wales which is the more clayey analogue of the more loamy Wilcocks series found in similar situations elsewhere.
- 9.79 The parent material of these soils is either clayey glacial till, probably locally derived from the underlying Carboniferous mudstone bedrock or, in a few cases, a more local superficial drift derived from the weathering mudstone itself. Whatever the origin of the parent material its overriding characteristic is its clayey texture. This material is slowly permeable and so the soil profiles suffer severely from impeded drainage, exacerbated by the high rainfall of the area. This is shown in the mineral part of the profile by greyish colours and prominent colour mottling (together referred to as gleying) and in the build-up of a surface layer of peat. Profiles are typically in Wetness Class V or VI on a scale ranging from I (well drained) to VI (effectively a bog). The typical vegetation also reflects the wet conditions, being dominated by *Molinia*, *Nardus*, mosses and rushes.
- 9.80 A typical profile of these has between about 10 and 40cm of black, acid, well decomposed peat at the surface. This overlies a grey, strongly mottled, heavy clay loam or clay sometimes stained in the upper part with organic matter from above. This continues to depth, at least as far as 1.2m from the surface – the maximum which could be reached with the hand auger used in the survey.
- 9.81 The areas of this soil type are located south and south-east of Rhaslas Pond.

Unit 2 Natural Soils - Loamy over Clayey

- 9.82 This soil type corresponds more or less to the Wilcocks series as recognised by the Soil Survey of England and Wales.
- 9.83 At depths of approximately 25 – 35cm on average, most of the profiles are clayey and similar to the entirely clayey profiles (Soil A or Roddlesworth series) described above but the uppermost part of the mineral profile is more loamy i.e. a medium clay loam or sandy clay loam rather than a heavy clay loam or clay. This material is more permeable and, probably as a result, the surface horizons remain wet for less time than in the heavier textured soils and accordingly the build up of peat is less. In addition many have what is thought to be a mineral, as opposed to a purely peat, topsoil but whether or not this is due to some previous period of cultivation is not known. Profiles are typically in Wetness Class IV or V as compared to the V or VI of the more clayey Soil Type A or Roddlesworth series. However, the vegetation is little different and is also dominated by *Molinia*, *Nardus*, mosses and rushes.
- 9.84 A typical profile has about 5cm of black, acid, well decomposed peat at the surface. This is followed by a dark brown, medium clay loam or sandy clay loam horizon i.e. the possible topsoil mentioned above, about 25-30cm thick. This passes down into a yellowish brown, heavy clay loam or clay subsoil. As noted above, the subsoil tends to become more clayey with depth and most of the profiles encountered during the auger boring survey had this sequence of textures. However, in a few cases and in the example found when the inspection pit was dug, the material at depth is a broken sandstone i.e. such profiles are formed in a relatively thin layer of glacial till or similar over a sandstone band. Unfortunately access difficulties prevented the digging of a pit representative of the more clayey variety.
- 9.85 This soil type is found as a fringe to and between the main areas of the heavier, wetter and more peaty soils (Clayey, Soil Type A or Roddlesworth series).

Unit 3 - Natural Soils - Loamy (Shallow)

- 9.86 These soils are quite different from those described above. They are formed more or less directly in weathered sandstone but with some superficial drift. They have a much lighter texture, are stonier, shallower but much better drained than the soils already described and so have little or no surface peat.
- 9.87 This soil type corresponds more or less to the Nercwys series as recognised by the Soil Survey of England and Wales.
- 9.88 A typical profile has a few centimetres (no more than 10cm but typically 5cm or less) of black, well decomposed peat. Like Soil Type B (Loamy over Clayey) there is then what appears to be a genuine mineral topsoil consisting of a dark brown, slightly stony, medium clay loam usually with common but faint ochreous mottles. The underlying subsoil is of a similar texture and so stony that during the hand auger survey it was often very difficult or even impossible to penetrate more than a few centimetres into it. Where it could be examined it was usually a yellowish brown in colour and only slightly mottled. The profile pit showed that this was a very stony material, effectively little more than weathered sandstone which merges down into harder flaggy sandstone or shale. The very stony material impenetrable by hand auger i.e. the weathered sandstone is usually within about 40 or 50cm of the surface but sometimes immediately below the topsoil.
- 9.89 The mottling in the profile is not very pronounced but does indicate some degree of drainage imperfection, possible due simply to the very high rainfall of the area. The profiles are, however, much better drained than those of the Clays (Soil Type A) or Loamy over Clayey (Soil Type B) and are typically only in Wetness Class III.

- 9.90 These soils are restricted in area. Their main occurrence is on the eastern edge of the site but there is also a notable patch in the south (GR 106 064) which stands out from the surrounding area as a raised "greener area" surrounded by wetter, peaty and clayey soils. There is also a small area south of Bryn Pyllog. Some of these areas contain actual sandstone outcrops and these were recorded during the survey as "rock outcrop".

Unit 4 - Disturbed Areas - Restored Surface Mining (Backfill Only)

- 9.91 As noted above, most of the northern half of the site has already been disturbed by surface mining. The largest area consists of open grassland, with some rushes in places, to the north of Rhaslas Pond.
- 9.92 The restoration, such as it is, seems to have consisted of simply the replacement and grading out of a shaley backfill. However, the uppermost 5 -10cm or so of the profile has become more weathered and somewhat loosened, overlying more consolidated shale backfill below.
- 9.93 A typical profile thus consists of a mat of poor decomposed turf at the surface over 10cm of dark brown heavy clay loam to clay with distinct ochreous mottles and a stoniness depending on the nature of the backfill at any particular location. This surface horizon appears to be developing from the original backfill and does not represent a separately placed topsoil layer.
- 9.94 In places the backfill is approximately a 50:50 mixture of mottled grey clay and fragments of shale and coal, while elsewhere it can consist of mainly of large shale and sandstone fragments with only a small amount of interstitial clay.
- 9.95 It is somewhat difficult to assess the drainage status of these profiles. The backfill is relatively consolidated but even so would seem to have a potentially better permeability than the clayey subsoils of most of the natural soils on the site. Nevertheless, at the time of the auger survey and the pit digging, surface conditions were very wet, there is mottling indicative of waterlogging in the developing topsoil. . On balance, a Wetness Class of IV is considered to be appropriate i.e. marginally better than most of the natural soils, but not as good as the shallower profiles over sandstone.

Unit 5 - Disturbed Areas - Restored Opencast (with Topsoil)

- 9.96 Along the northern fringe of the site there are a number of fields, enclosed by double hedges, where the land has been restored to a higher standard and there is a recognisable topsoil horizon which may actually represent the deliberate spreading of topsoil overlying the underlying shale overburden material.
- 9.97 This topsoil is a heavy clay loam, generally less stony than on the main restored areas, not so mottled and not so wet at the time of the survey. Otherwise the same sort of backfill is present as on the rest of the restored land.

Unit 6 - Disturbed Areas - Tips and other areas of surface disturbance

- 9.98 Land alongside the road on the western edge of the site and along the northern edge of Rhaslas pond has been classed as disturbed land, mainly as a result of former mining and associated surface tip heaps and other disturbance.
- 9.99 In the west, the area is characterised by numerous shafts and small tipped areas, together with a number of small ponds. Disturbed profiles encountered in this area comprise a mixture of shales and clays beginning to form a sort of topsoil over "raw" shale material below. There are a few patches of natural soils between these disturbed areas with soils similar to the nearby Clay (Peaty Top) soils but the areas are too small to delineate separately. Along the north edge of Rhaslas pond, the area is characterised by more obvious raised tip areas.

Agricultural Land Classification

- 9.100 It has been noted in the background description to the area that the whole site has been shown on the 1:63,360 provisional ALC maps produced in the 1960s and 1970s as Grade 5 because of the adverse climate, upland soils and low-intensity land-use which these factors produced.
- 9.101 In the revised system the climate alone is so severe that none of the land can be graded any higher than Grade 4, with much of it Grade 5 because of the additional limiting factor of wetness and peaty topsoils. Only the relatively well drained Loamy (shallow) soils would actually qualify for Grade 4, but the other two natural soils suffer from such severe additional wetness limitations that they are no better than Grade 5.
- 9.102 The ALC grading of the areas disturbed by previous surface mining is more difficult and requires a degree of subjective professional judgement. Essentially the question is whether the somewhat better drainage allows them to remain in Grade 4 to which, as noted above, the climate already limits the land to, or if they are still so poor as to downgrade them to Grade 5. It is considered that the better restored land along the northern edge of the site is sufficiently good to qualify for Grade 4, but that the bulk of the restored land remains in Grade 5, if only because of the absence of any developed topsoil being available.
- 9.103 The site also includes a number of non-agricultural areas, including the inert landfill operation run by Merthyr Industrial Services (MIS), together with waterbodies including Rhaslas pond, the remnants of a sandstone quarry on the eastern part of the site and small areas of woodland.

Farm Holdings (Outside the boundary of the Gelligaer and Merthyr Common)

- 9.104 Figure MA/NL/ES/09/005 shows the location of the 2 individual farm holdings located on the site outside of the common land area.
- 9.105 Farm Holding 1, includes an area approximately 78ha of land within the site boundary for the project. In addition, a further 21ha within the application site is farmed as part of Farm Holding 1 by agreement with Miller Argent. The farm also has grazing rights on the Gelligaer and Merthyr Common.
- 9.106 The farmhouse and buildings that form part of Farm Holding 1 are located to the north of the land beyond the boundary of the scheme at Cwm-Carno. The farm holding comprises a total of approximately 140ha (350 acres) of land and is used for livestock production including approximately 45 spring calving pedigree Welsh Black cattle together with Welsh Mountain and Texel cross breeds.
- 9.107 Farm Holding 2 includes land that is situated to the east of the site and comprises approximately 34.7 ha of land, 0.7 ha of which is owned and 34 ha of which is farmed on the basis of a short term agreement with the owner, Miller Argent. This land is farmed as an isolated block of land, with no farm buildings and is used as sheep grazing land by the current tenant.
- 9.108 With the exception of a small area of land (approximately 6.5ha) immediately to the south of farm holding 2, which comprise non-agricultural land including the remnants of a sandstone quarry, the remaining area of the site forms part of the Gelligaer and Merthyr Common.

Additional Areas – Desk Top Information

Location

9.109 The additional areas of land which lie beyond the boundary of the main site area have been identified for a number of temporary, compensatory land uses, including grazing, informal public recreational use and/or ecological offsetting. The areas included within the study area are illustrated on Figure MA/NL/ES/09/001 and include areas of land;

- Area 7 West of Pontlottyn
- Area 8 South of Pontlottyn
- Area 9 West of Bryn Caerau
- Area 10 Bryn Caerau
- Area 11 East of Pentrebach; and
- Area 12 Penddeugae-Fach

Climate

9.110 As for the main site climatic data has been obtained from the Meteorological Office's standard 5km grid point data set for a point on each of the additional areas of land. The climatic data are therefore as follows:

Table 9.9 – Additional Areas Climate Data

Reference Point	SO 125 045 Areas 6 and 7	SO 083 050 Area 9	SO 086 040 Area 10	SO 075 035 Area 11	SO 086 010 Area 12
Altitude (m)	400	310	320	320	330
Average Annual Rainfall AAR (mm)	1545	1579	1583	1598	1559
Accumulated Temperature ATO (day degrees)	1090	1193	1182	1183	1172
Moisture Deficit for wheat (mm)	19	27	26	24	24
Moisture Deficit for	2	14	9	1	0

Reference Point	SO 125 045 Areas 6 and 7	SO 083 050 Area 9	SO 086 040 Area 10	SO 075 035 Area 11	SO 086 010 Area 12
potatoes (mm)					
Field Capacity Duration (days)	295	301	301	303	297
Maximum ALC Grade	4	4	4	4	4

Geology

- 9.111 According to the 1:50,000 geological map (Sheet 232, Abergavenny), the local bedrock consists mainly of Coal Measures mudstones, siltstones and sandstones, generally referred to as the Pennant Sandstone. Thicker bands of sandstone are shown separately notably at the eastern end of the area to the west of Bryn Caerau (Area 9) and the adjacent part of the land around Bryn Caerau itself (Area 10) as well as the north-east corner of that area. These bands are also located on the western half of the land to the east of Pentrebach (Area 11) and most of the area at Penddeugae-Fach (Area 12).
- 9.112 No superficial deposits are shown other than a narrow strip along the southern part of the course of the Bargod Taf in the area around Bryn Caerau and slightly wider strip of glacial till down the western side of the river.

Soils

- 9.113 Developed on the area of Pennant sandstone there are extensive areas of peaty soils on the higher, flatter, plateau-like parts of the landscape. These are grouped as the Gelligaer Association (654c) described as a collection of "loamy permeable upland soils over sandstone with a wet, peaty surface horizon and bleached subsurface horizon. Some soils have a thin ironpan and there is rock and scree locally".
- 9.114 The only locations where such soils may be located within the additional areas are on the highest and relatively flat parts on the western edge of the area around Bryn Caerau (Areas 9 and 10) and in the south west of the land at Penddeugae-Fach (Area 12).
- 9.115 The Bulletin describes typical soils of the Gelligaer Association as being extremely acid with a peaty top about 20cm thick. There is a grey, strongly leached and often very stony subsurface horizon with evidence of gleying (a feature of waterlogged soils) underlain by a thin, dark reddish zone of iron, aluminium and humus accumulation, sometimes in the form of thin discontinuous ironpans. Most of the soils overlie fragmented sandstone within about 40 to 80cm of the surface. Where undrained (their normal situation), the soils are wet for most of the year (Wetness Class V) with rapid winter run-off. The soil wetness results from a combination of high rainfall, low evapotranspiration and gentle relief, and the sponge-like properties of their peaty tops. This is in spite of their relatively permeable subsoils in contrast to some of the soils of the Wilcocks soils on lower land which have slowly permeable subsoils.
- 9.116 The Gelligaer Association gives way on the adjacent slopes to soils of the Withnell 1 Association (611d). This is a collection of "well drained loamy soils over sandstone, usually on steep slopes.

Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging occur (on thin bands of shales within the Pennant Sandstone) and there is bare rock locally”.

- 9.117 The Withnell 1 Association is typically found on steep slopes, but can also be found on more gently sloping land at higher altitudes where it has perhaps resulted from the transformation of Gelligaer type soils by past cultivation. It is characterised by soils with a bright reddish brown or orange brown iron-rich subsoil. This overlies sandstone or very stony superficial drift within 50 to 80cm of the surface, with a tendency for the soils to be deeper towards the lower slopes.
- 9.118 The National Soil Map shows soils of this Association over with the exception of additional land with the exception of the land to the west of Bryn Caerau and the lower lying parts of the Bargod Taf valley (Area 9) in the Bryn Caerau area itself (Area 10).
- 9.119 By comparison with the soils of the Gelligaer Association, the topsoils of the soils found in the Withnell 1 Association are not usually peaty but are often very thin, especially on uncultivated land. Also, in contrast to the Gelligaer Association soils, these are well drained (Wetness Class I) soils which readily absorb winter rain. There are, however, local occurrences of less well drained soils on patches of thick, slowly permeable drift or in small valleys associated with spring-lines. Some of the steepest slopes are rock-dominated either with scree slopes or actual outcrops of the bedrock
- 9.120 The strips of Glacial Till on the lower ground give soils of the Wilcocks 1 Association (721c). These are “slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey upland soils with a peaty surface horizon. Coarse loamy soils affected by groundwater occur in places. The soils are very acid when not limed.”
- 9.121 The Wilcocks 1 Association (721c) is typically found on areas of heavy textured glacial till (boulder clay) and Coal Measures shales, usually on lower ground and this is the Association shown for the area west of Bryn Caerau (Area 9) and the lower lying parts of the Bryn Caerau area itself (Area 10).
- 9.122 Soils typical of the Wilcocks association are severely or permanently waterlogged near the surface (Wetness Class V or VI) due to a combination of high rainfall, impermeable subsoil, gentle relief (i.e. slow runoff) and sometimes inflow of water from adjacent higher ground. The profiles thus show evident signs of waterlogging (gleying) and have peaty topsoils. This organic surface topsoil is acid and between 10 and 40cm thick, with underlying grey, strongly mottled clay loam or sandy clay loam subsoils often stained with organic matter from above. Stone content frequently increases with depth.

Farming Statistical Information

The relevant farming statistical information for the main site as shown in Tables 9.7 and 9.8 is also applicable to the additional areas which all fall within Caerphilly or Merthyr Tydfil farming statistical districts.

Site Survey of additional areas – soils, agricultural land quality and farming

Area West of Pontlottyn (Area 7)

- 9.123 This area of approximately 13.4 hectares lies to the west of Pontlottyn. This land forms part of a farm holding located to the east of the A469 at Troedrhifwuch Farm. The holding is a livestock based farming enterprise, which comprises a large area of land immediately around the farm buildings. In addition to the farming interests, the family also operate a local plant hire business.

- 9.124 This area comprises good quality semi-improved and improved grassland. The soil types identified within the area are shown on Figure MA/NL/ES/09/006. On the northern and southern parts of this area of land the soils are predominantly loamy over clayey, with heavy clay loam topsoils overlying mottled and slowly permeable clayey subsoils at shallow depth.
- 9.125 In the central part of the area there is a large field that has been previously disturbed where soil profiles are typical of other restored areas on the main site and comprise a shallow developed heavy clay loam to clay topsoil overlying tipped or backfilled shale material.
- 9.126 On the higher land on the eastern fringe of the site the soils become characteristically lighter textured and stony. Profiles comprise medium clay loam topsoils and upper subsoils overlying sandstone at depth.
- 9.127 The agricultural land classification of the area is limited to grade 4 overall by the climate. In addition, the restored and loamy over clayey soils are limited to grade 4 by a susceptibility to soil wetness and the steeper areas of the site are limited to grade 4 due to a gradient limitation.

Area South of Pontlottyn (Area 8)

- 9.128 This area lies between the A469 and the access track/road across the common running south from Pontlottyn and is centred around the former settlement of Troedrhifwuch. This land is farmed, together with the land to the west of Pontlottyn as part of Troedrhifwuch Farm.
- 9.129 The soil types identified within the area are shown on Figure MA/NL/ES/09/006. It comprises approximately 59ha with improved grassland areas on the higher land to the south of the area and semi improved grassland areas alongside the A469 on the lower lying land.
- 9.130 The highest land within this area, to the northeast of the single track road is characterised by well drained loamy soils overlying sandstones at a depth of approximately 40 – 50cm depth. As the land drops to the north east of this area, the soils become shallower over the sandstone with slopes characteristically of between 18 - 20°. These are typical of small areas of the main site where loamy soils overlying sandstone layers are identified on the eastern part of the operational area. However, this area comprises a larger consolidated area of deeper loamy soil resources than the main site.
- 9.131 On the lower lying land alongside the A469, the soils are more variable and show signs of mass movement, with buried topsoils being identified in some of the observations. The soils are generally much wetter than on the sandstone areas to the north east, with profiles often comprising loamy topsoils over poorly drained clayey subsoils at depth. There are natural streamlines and artificial drainage channels crossing this area.
- 9.132 The agricultural land classification of the area is limited to grade 4 overall by the climate. In addition, the loamy over clayey soils on the lower lying eastern side of the areas are limited to grade 4 by a susceptibility to soil wetness and the steeper areas of the site are limited to either grade 4 or, in limited areas, grade 5 due to a gradient limitation.

Land west of Bryn Caerau (Area 9)

- 9.133 This area comprises approximately 6ha of semi-improved and unimproved grassland, which is not actively farmed at present. The soil types identified within the area are shown on Figure MA/NL/ES/09/006. The western part of this area has been subject to disturbance and the profiles comprise a very thin turf layer directly overlying tipped shale material. These profiles are similar to those found on the tipped and restored areas on the central and eastern parts of the main site.
- 9.134 Further to the east of this area, there is a boundary between the worked and undisturbed land, which can, at certain times of the year, be picked out visually on the ground. Beyond this the soils become characteristically wetter. Profiles comprise either humose medium clay loams overlying

mottled slowly permeable clays at depth, or thin peaty topsoils overlying slowly permeable sandy clays or clays at shallow depths.

- 9.135 The agricultural land classification of this area is restricted overall to grade 4 due to the climate. In addition, the restored area to the west comprises a limited development of turf over backfilled shale material which restricts the grading of this area to grade 4 at best. The eastern part of this area, which comprises humose or thin peaty topsoils, is additionally limited by severe wetness to grade 4 and 5 where peaty topsoils are found.

Bryn Caerau (Area 10)

- 9.136 This area has been subdivided into areas a, b and c as shown on Figure MA/NL/ES/09/006. The whole Bryn Caerau area is currently farmed as a livestock based enterprise located at Bryn Caerau Farm on the basis of a short term tenancy agreement with the landowner.
- 9.137 Area (a) comprises approximately 21.12 ha mainly improved grassland fields on the upper and east facing slopes. The soils are characteristically similar to the loamy over clayey soil type identified within the main site with a heavy clay loam overlying slowly permeable subsoils at depth. Stone contents are variable, with some profiles comprising moderately stony subsoil horizons.
- 9.138 Area (b) similarly comprises approximately 25.61ha improved grassland fields characterised by soils that are heavy textured, characteristic of the loamy over clayey soil type identified on the main site.
- 9.139 Area (c) comprises approximately 145.14ha of a mixture of improved and semi improved grassland fields at the north of the area. However, further to the south, particularly south of Pwll-glas, the land becomes more heavily invaded by scrub, bracken and areas of woodland with steepening slopes running from west to east across this area down into Cwm Golau.
- 9.140 The soils identified on the northern part of area (c) are characteristic of the loamy over clayey soil type identified on the main site. However, to the south, where the slopes steepen the presence of sandstone becomes more evident, with higher stone contents and particularly shallow soils overlying sandstone identified on the steepest areas which have been subject to landslipping.
- 9.141 The agricultural land quality of the whole of the Bryn Caerau area is restricted to grade 4, at best by an overall climatic limitation. In addition, where slopes are particularly steep on the southern parts of this area, the quality of the land is restricted to grade 5, due to a gradient limitation. Some of the southern part of area (c) would be classed as non-agricultural due to the extent of scrub invasion and areas of woodland.

Land East of Pentrebach (Area 11)

- 9.142 The soil types identified within the area are shown on Figure MA/NL/ES/09/006. This area comprises approximately 25 ha of land, which comprises mainly semi-improved grassland. The land is farmed under a short term agreement with the landowner as an off lying piece of land to a larger livestock based farm holding located at some distance to the north at Cwmblocks Farm.
- 9.143 The soils on this area are characteristically heavier textured soils, more typical of the loamy over clayey soil type identified within the main site. Soil profiles typically comprise a medium or heavy clay loam topsoil overlying a slowly permeable clayey subsoil at 25 – 35cm in depth. Stone contents in the profiles vary, but some profiles, particularly to the west of the area, comprise a higher proportion of sandstone.
- 9.144 The agricultural land classification of the area is restricted to grade 4 overall by an overall climatic limitation. In addition, the loamy over clayey soils within the area are limited to grade 4 by a susceptibility to soil wetness.

Land at Penddeugae-Fach (Area 12)

- 9.145 The soil types identified within the area are shown on Figure MA/NL/ES/09/006.
- 9.146 This area comprises approximately 50ha of land, the majority of which comprises improved grassland fields, although the steeper sloping sections to the east and west comprise some scrub and bracken. The land is farmed on the basis of a short term agreement with the landowner as an off lying piece of land to a larger livestock based farming enterprise based to the south at Cascade Farm, Penpedairheol.
- 9.147 The main higher areas of the land, where the slopes are gentle to moderate comprise well drained loamy soils overlying sandstones at a depth of approximately 40 – 50cm depth. As the land drops to the north and south and the slopes become steeper (>18°), the soils become shallower over the sandstone.
- 9.148 The agricultural land classification of the area is restricted to grade 4 by and overall climatic limitation. In addition, there are small areas on the eastern and western side of the area where the slopes steepen and the land is limited by gradients to grade 4 and in small areas grade 5.

Measures adopted as Part of the Scheme

Restoration Strategy - Soil Handling Methods

- 9.149 Two individual draft soil handling methodologies have been developed for the soils on the site based on the identification of peat and non-peaty soils. The methodologies that have been developed take into account the following best practice guidance, together with advice given by consultees within the Welsh Government and CCW:
- DEFRA (2000) Good Practice Guide for Handling Soils
 - Relevant Guidance on the assessment and handling of Peat Resources including
 - CCW Guidance Note – Assessing the impact of windfarm developments on peatlands in Wales – CCW 2010
 - Guidance on the assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste SEPA/Scottish Renewables, January 2012
 - Guidelines for Peatland Restoration – Peatlands and Uplands Biodiversity Group (Northern Ireland) October 2010
 - DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.
 - DETR (1999) Soil Forming Materials – Their Use in Reclamation
- 9.150 The methodologies have been based on the detailed assessment of soil resources that has been carried out on the main site and the design of the restoration strategy has been devised taking these into account.
- 9.151 The general principles on which both the peaty and non-peaty methodologies are based are:-
- Recognition of and separate handling of different kinds of topsoils, subsoils and other potential soil forming materials available on site;

- Handling of soils, particularly during the replacement phase, by such machinery and operated in such a way as to reduce the potential for soil damage and compaction; and
- Ensuring that all concerned are aware of the objectives and methodology and that operations are adequately supervised and monitored.

9.152 The detailed draft methodologies for both peaty and non-peaty soils are attached at Appendix MA/NL/ES/09/002 and Appendix MA/NL/ES/09/003 respectively. The generation of soils from areas of the site that are stripped and their re-use in the restoration of the site are described below.

Soil Resource Generation

9.153 The various different soil and peat resources that would be generated during the stripping of the site are as follows:-

Unit 1 - Clayey with Peaty Surface

This soil type is located to the south and south-east of Rhaslas Pond. Soil profiles typically comprise black, well decomposed peat to a depth of approximately 30cm overlying a dark greyish brown mottled clay with a massive structure. This overlies a dark grey mottled clay with massive structure at a depth of approximately 1m from the surface.

This soil unit is situated in an area designated for overburden storage. No excavation of coal is proposed within this area. It is therefore proposed that only the surface peat would be stripped, stored and re-spread, using the Peat Handling Methodology described elsewhere. The overburden stores would be established on the underlying clay, where possible, which would form a stable base.

Unit 2 - Loamy over Clayey

This soil type is found as a fringe to the east of the main area of the peaty soils (Unit 1). Profiles commonly comprise approximately 5cm of peat overlying the rest of the non-peaty sandy clay loam or medium clay loam topsoil. The depth of the topsoil is approximately 30cm including the surface peat and overlies yellowish brown heavy clay loam/clay.

As with Unit 1 this soil type occurs within the overburden storage areas and so it is proposed only to strip, store and re-spread the topsoil. The restoration proposals are for this topsoil to be re-spread over a suitably treated clayey basal layer. The thin surface build-up of peat, no more than 5cm thick, is too thin to be stripped separately and would be included with the rest of the topsoil.

Unit 3 - Loamy Shallow

These soils are restricted in area and comprise shallow soils over bands of flaggy sandstone rock. They are found mostly on the eastern fringe of the site but there is also a notable patch (GR 106 064) which stands out from the surrounding area as a raised "greener area" surrounded by wetter peaty and clayey soils. There is also a small area south of Bryn Pylllog. Soil depth is variable but inspection pits suggest that there is on average approximately 20cm medium or sandy clay loam topsoil over a relatively free draining, but stony subsoil to average depth of about 70cm from the surface i.e. a subsoil thickness of approximately 50cm.

Within these areas it is proposed that the topsoils would be stripped to a thickness of 20cm and the subsoils to a thickness of 50cm. Very rocky material at depth would be treated as suitable for backfilling only.

Unit 4 – Restored Opencast –Tipped Backfill only

These areas are located mainly to the north east and north of Rhaslas Pond. To the north east, the land comprises restored tipped areas, where the materials comprise a mixture of shales and clays over shale material below. To the north of the pond, the opencast restoration profiles are relatively uniform and comprise approximately 5 - 10cm of clay with abundant shale over a consolidated shale backfill below.

This shallow and variable depth of disturbed material has not been identified as a separate soil horizon and is not proposed to be stripped as a separate resource. However, where practical, a thin layer of material may be stripped, stored and used as a soil forming restoration material.

Unit 5 – Restored Opencast with recognisable topsoil

Along the northern fringe of the site there are a number of fields, enclosed by double hedges, where the land has been restored to a higher standard and a recognisable topsoil horizon has developed overlying the underlying shale backfill.

The soil resources comprise an average of approximately 20cm of heavy clay loam topsoil material overlying the shaley backfill which, as in Unit 4, would be removed, stored and returned as backfill material.

Unit 6 – Tips and other areas of surface disturbance

Land alongside the road on the western edge of the site and along the northern edge of Rhaslas pond has been classed as disturbed land, mainly as a result of former mining and associated surface tip heaps and other disturbance.

Along the north edge of Rhaslas pond, the area is characterised by raised tip areas. In the west, the area is characterised by numerous shafts and small tipped areas, together with a number of small ponds. Disturbed profiles encountered in this area comprise a mixture of shales and clays beginning to form a sort of topsoil over “raw” shale material below. There are a few patches of natural soils between these disturbed areas with soils similar to the nearby Clay (Peaty Top) soils but the areas are too small to delineate or strip separately.

Soil Resource Generation - Summary

9.154 The depths of available materials within the different soil units are summarised in the table below, together with the volumes of the different materials that would be stripped as part of the Scheme.

Table 9.10: Soil Resource Generation

Soil Unit	Approximate Average Thickness (cm)	Area (m ²)	Volume (m ³)
1. Clayey with Peaty Surface	30cm peaty topsoil	65.0	195,120
2. Loamy over clayey	30cm sandy clay loam/medium clay loam	21.4	64,210
3. Loamy shallow	25cm sandy clay	7.2	17,940

Soil Unit	Approximate Average Thickness (cm)	Area (m ²)	Volume (m ³)
Topsoil	loam/medium clay loam		
Subsoil	50cm moderately to very stony medium clay loam	7.2	35870
4. Restored Opencast –	No available topsoil	No natural soil resource	
5. Restored Opencast – with Recognisable Topsoil	20cm heavy clay loam topsoil	11.0	21,970
6. Disturbed and tipped areas	No available topsoil	No quantifiable natural soil resources	
7. CDP – Stored Soils		20.0	28,000

Soil Resources – Restoration

- 9.155 Figure MA/NL/ES/007 shows the approximate distribution of the restored land uses within the stripped area and the Table 9.11 below provides the restoration specification for the different restoration areas identified on the figure.
- 9.156 The intention of the restoration strategy is largely to restore the existing distribution of soils and land uses across the site. The area of wet heaths (Land Use Type A) would utilise the peat resources on site, with a maximum of 35cm depth of peaty material restored over clays that would remain in situ beneath the overburden mounds during the operational period.
- 9.157 Similarly, the wetland areas (excluding Rhaslas Pond) (Land Use Type B) would be restored using 35cm depth of peaty topsoil resources. These peat soils would either be overlaid onto in situ clays or, where the wetland areas are to be created over previously restored area, a clay “lining” to the wetland area would need to be created using clay resources from the southern part of the site, where the natural soils overlay clayey subsoil horizons. If, for example, a 30cm depth of this area is put into the wetland zones, this would require a maximum of approximately 21,000m³ of clay to be moved into this area. Areas A and B would utilise all of peat resources from within the stripped area. An allowance has been made to spread these soils to a slightly greater depth (35cm) than the recorded average on site (30cm). This is in recognition of the sensitivities of the peat soils and the likelihood that losses may occur during the stripping, storage and replacement process. The deepening of the soil materials within a slightly smaller area would help to ensure that the full depth of the original profile can be returned, taking into account potential for soil losses during the operational period.
- 9.158 Much of the site, Land Use Type C is to be restored to its current upland grassland use. This grassland is found on both natural soil resources to the south of the site and also on the large restored area of land to the north of the site, where soil resources are limited. It is the intention to strip and restore the natural soils and upland grassland use in the southern part of the site, close to its existing location.

- 9.159 Approximately 29ha of Land Use C shown as C1 would comprise the topsoils from unit 2, restored to a depth of 22cm overlying the in situ clays beneath the overburden and soil storage areas.
- 9.160 The area of restored upland grassland (C3) to the far north includes an area of 11 ha of land, where a 20cm depth of topsoil has developed above the restored opencast shale backfill. It is proposed that these soils should be returned to their original location within this area.
- 9.161 The area of upland grassland (C4), approximately 123.1ha, includes the restoration of the remaining area to the north of the stripped area, which was previously subject to opencast operations, where no natural soil materials remain. This land would be restored using suitable materials (soil forming materials) identified during the excavation process.
- 9.162 The final area of upland grassland restoration (C5), approximately 20ha, includes the re-establishment of the upland grassland area across the CDP area. This would include the use of the soils that have already been stripped and stored around the periphery of the site in order to restore the land to its former use.
- 9.163 Land Use Type D includes the area of land currently subject to landfilling operations. This area would be capped with suitable clay materials
- 9.164 Land Use Type E includes areas of woodland, which would be established on land which was previously subject to opencast operations, where no natural soil materials remain. This land would be restored using suitable materials (soil forming materials) identified during the excavation process.
- 9.165 Land Use Type F includes the re-establishment of the Rhaslas pond area where it is anticipated that no soil materials would be required.

Table 9.11 – Restoration of Soil Units

Restoration	Area for restoration (ha)	Specification	Volumes (m ³)	Soil Unit
A Peat land	48.7 ha	35cm Peaty Topsoil (above in situ clays)	170,620	Unit 1
B Wetland Area	7.0 ha	35cm Peaty Topsoil (over in situ or placed clay base)	24,500	Unit 1
C1 Upland Grassland (southern area)	29.0 ha	22- 23 cm Topsoil (overlying in situ clays)	64,210	Unit 2
C2 Upland Grassland (southern area)	7.2 ha	25cm Topsoil 50cm Subsoil	17,940 35,870	Unit 3

Restoration	Area for restoration (ha)	Specification	Volumes (m ³)	Soil Unit
C3 Upland Grassland (northern area)	11 ha	20cm Restored Topsoil (overlaid onto minimum of 0.8m suitable excavated material)	21,970	Unit 5
C4 Upland Grassland (northern area – previously opencast)	123.1 ha	0.5 of suitable excavated material (soil forming material)	615,500	Unit 4
C5 Upland Grassland (CDP)	20 ha	14cm Stored topsoil overlaid onto suitably restored base following removal of CDP infrastructure.	28,000 (storage mounds)	Previously stored soil materials
D Area of landfill within the disused railway	4ha	Excavated materials to cover and restore landfill.		Excavated capping and restoration materials.
E Woodland (previously opencast)	4.4 ha	0.5m of suitable excavated material (soil forming material)	22,000	Unit 4
F Rhaslas Pond	12.3 ha	No soils required	0	

Aftercare

9.166 Once the restoration of soil materials within identified phases of the site is complete, these areas would enter the minimum 5 year aftercare period, which would eventually lead to the complete reclamation of the site.

9.167 In outline, the aftercare programme would contain proposals for the following key elements:

- Initial cultivations, as required, prior to grass sowing to ensure that the soils are not over cultivated or damaged;
- Grass seeding including hydroseeding on areas of wet heath restoration;

- Soil samples would be taken and analysed and the appropriate fertiliser /lime dressings would be applied to encourage the initial grass establishment;
- Other operations, including weed control treatments would be undertaken as necessary;
- Any remedial soil treatments, including stone-picking and subsoiling would be undertaken as necessary; and
- Annual aftercare meetings would be held with the MPA and other stakeholders including National Resource Wales to review progress and specifically to review cropping and husbandry information for the preceding year and to agree cropping and husbandry proposals for the forthcoming year.

9.168 Prior to the commencement of aftercare a detailed scheme would be submitted to the Mineral Planning Authority (MPA) for the first year of the minimum five year period. Following the commencement of the aftercare programme, a report summarising the overall progress in aftercare would be submitted to the MPA annually. This report and proposed programme for the following year would be discussed and amended as necessary annually at a meeting with representatives from the MPA,

Temporary Areas for Grazing

9.169 Three areas of land have been identified to the west of the railway for use as temporary grazing and/or access during the lifetime of the project. These include the areas of land:

- West of Bryn Caerau (Area 9)
- East of Pentrebach (Area 11)
- Penddeugae Fach (Area 12)

9.170 These areas would be made available to all of Merthyr and Gelligaer Commoners with grazing rights to use as additional grazing land during the life of the project. All of the areas currently adjoin the common. The area west of Bryn Careau (Area 9) lies immediately to the north of the current Common. The area to the east of Pentrebach (Area 11) is enclosed by existing Common and the land at Penddeugae Fach (Area 12) adjoins Common CL38 on its eastern, western and northern sides and abuts Common CL1 on its southern side. A seamless connection between these areas and the existing common CL38 can therefore be established. However, the boundary between the land at Penddeugae Fach (Area 12) and Common CL1 would be maintained by a stock-proof barrier to prevent migration between the two commons.

Environmental Assessment

9.171 The assessment of environmental effects on agricultural land use and soils during the lifetime of the Project takes into account the following key stages:

- **Site Establishment:** prior to the commencement of the mining operations a number of preliminary operations would be undertaken. These would include:

Site set up including the erection of boundary fencing;

Diversion of the existing overhead power lines to land west of the operational site area;

Construction of the water treatment facilities;

Reducing the size of Rhaslas Pond;

Construction of the accommodation and car parking area;

Erection of on-site coal processing plant, internal roads ; and

Preliminary soil stripping and construction of soil mounds/noise and visual impact mitigation bunds.

- **Land Remediation Works:** These works would be undertaken in areas to the south and east of the operational area and would include the surface treatment of land in these areas to address instability associated with old mine shafts and adits; the scouring of old colliery tip material into water course feeding Darran Park Lake; general tidying up and surface treatment of areas closest to settlements and the provision of additional public access resources that would not be affected by the mining and associated operations. These works would be completed within 2 years of commencement of operations.
- **Waste Tipping:** Merthyr Industrial Services waste tipping operation along the disused railway cutting in the southern sector of the operational site could potentially continue up to the start of site operations, after this the land would be required for overburden storage. This land is not within the urban common and is not crossed by any public rights of way, so there would be no effects on recreational resources.
- **Dispositions 1 to 5:** These are the five operational phases for the excavation and storage of overburden to expose the coal; the progressive extraction and processing of the coal for dispatch to market via Cwmbargoed Disposal Point (CDP); the progressive backfilling of the void behind the advancing coaling operations; the return of stored overburden to backfill the final void; and the preparation of the final land form. These are shown on the planning application drawing numbers MA/NL/PA/004-008.
- **Operations at the CDP:** The existing CDP, currently used in relation to the Ffos-y-fran Land Reclamation Scheme (FLRS), would also accept the coal from the project. Other operations undertaken at the CDP would include coal stocking; coal washing, processing and preparation for market; dispatch of coal by road and rail to market; water treatment facilities; use of railway sidings, coal lorry maintenance workshop, coal analysis laboratory, visitor/education centre, staff and operative accommodation/welfare facilities and car parking. The CDP lies on land where the rights of common have been suspended since 1957 and it is not crossed by any public rights of way, so there would be no effects on recreational resources arising from its use.
- **Restoration of the land:** following the cessation of coaling the remaining void would be filled and the spreading of soils and soil-forming materials would be undertaken. In accordance with the restoration strategy, micro-topographical features would be formed; water and landscape features established; areas for ecological interest established; public rights of way and other linear routes reinstated or created and, following a period of after-care, the rights of access across the urban common reinstated.
- **Decommissioning of the CDP:** This may include the removal of all plant, machinery and buildings and the restoration of the land to urban common.
- **Aftercare:** Predominantly agricultural operations for a minimum period of five years to rehabilitate the surface of the land and render it fit for the proposed after-use.

The effects of the relevant stages of the Project on both the main site and the additional areas are assessed below.

Main Site – Soils

Site Establishment and dispositions 1 to 5

- 9.172 The soils within the area of the main site would be stripped and stored until required for restoration of the site, with the exception of the temporary remediation areas as shown on Site Layout Drawing MA/NL/PA/003. The detailed soil survey of the land affected has found that the site, excluding the short term remediation areas, comprises a large proportion, approximately 126ha (51%) of previously disturbed land where firstly iron scouring, followed by surface mining and tipping operations have historically taken place. Within the majority of these areas there are no natural soil resources that can be stripped and reused, with the exception of the land at the northern part of the site, where the agricultural management practices adopted in the area have led to the development of a recognisable topsoil horizon.
- 9.173 The area of undisturbed soil materials and restored areas where recoverable topsoils have developed that could be affected during the site establishment and stages of operation would therefore comprise approximately 104.2 ha of land. The distribution of soil types within this area is shown on Figure MA/NL/ES/09/003 and, for the purpose of assessment, they can be divided into two main groups.
1. Mineral soils including:
 - Loamy over clayey soils
 - Loamy (shallow)
 - Restored opencast with topsoil
 2. Clayey soils with a peaty topsoil

Mineral Soils

- 9.174 The soil handling strategy for the mineral soils as described in Appendix MA/NL/ES/09/003 incorporates recognised best practice (outlined in Paragraph 9.16) in the stripping, storage and replacement of these soil resources. The areas of the soil types (excluding the temporary remediation and overhead line diversion areas) that would be stripped within the main site are approximately as follows:
- Loamy over clayey – 21.4
 - Loamy shallow – 7.2ha
 - Restored opencast with topsoil – 11.0ha
- 9.175 Where these soils are to be disturbed the soil materials would be placed in store until required for restoration and there would therefore be a long term temporary effect on these materials. These soil units do comprise medium to heavy textured topsoils which, although much less sensitive than deep peat (> 50cm) soils and high quality soil materials, can be susceptible to damage during handling. Although best practice would be applied in the timing and method of soil handling to be applied, they are assessed to be of low sensitivity due their low susceptibility to damage. There is likely to be some minor losses of soil materials during the handling and storage operation which are assessed to be of low magnitude. Overall, during the operation of the scheme it is assessed that there would be a **minor adverse long term temporary** effect on these soil resources.

Clayey Soils with a peaty topsoil

- 9.176 A total of approximately 65 ha of this soil type would be stripped within the area of the main site (excluding the remediation areas) where these soils are to be disturbed during the operations. A separate soil handling methodology has been developed for those soils with peaty topsoil horizons which takes into account the particular characteristics of this material when being moved and stored. This methodology is attached at Appendix MA/NL/ES/09/002 and includes the storage and monitoring of the peaty material in constructed containment areas.
- 9.177 The only exception to the treatment of this soil type is proposed for the area of the water recycling facility to the west of the CDP. In view of its limited area and remoteness from the main site, it is proposed here that the peaty topsoil would be stripped together with a shallow layer (10cm) of upper clayey subsoil and banded as a mixed soil material around the facility in readiness for restoration at the end of the operational period.
- 9.178 These shallow peaty soils are assessed to be of moderate sensitivity in terms of their susceptibility to damage during disturbance. The potential loss of a proportion of these materials during the stripping and storage operations means the impact is assessed to be of medium magnitude. The overall significance of the disturbance of these shallow peat resources are therefore assessed to be of **moderate adverse long term temporary significance**.

Land Remediation Works

- 9.179 In addition, there are areas within the application site where no site operations or soil disturbance is proposed. This includes areas of land identified for remediation (see Figure MA/NL/PA/003), where small scale works are to be undertaken at shaft and adit sites, together with the drainage, stabilisation and localised regrading of the colliery tip areas immediately to the north of Fochriw. There are also other areas along the north and eastern fringe of the site where the land would generally not be disturbed and soil materials would remain in situ during the operations (shown as white areas on proposed Site Layout Drawing MA/NL/PA/003).
- 9.180 The proposals do not include the stripping, storage or movement of areas of soil materials within the remediation areas. Whilst these works may lead to some limited areas of soil disturbance around shaft and adit sites it is assessed that the magnitude of any such impact on soil resources would be negligible. The areas where these works are to be carried out do not contain areas of soils with sensitive peaty topsoils and are instead dominated by previously worked or disturbed areas where very limited soil resources have been identified. The sensitivity of the soils in these areas is therefore assessed to be low and the overall significance of these remediation works on soil resources is therefore assessed to be of **negligible medium term temporary significance**.

Land Restoration and Aftercare

- 9.181 For the mineral soil resources, the implementation of the proposed soil handling methods and the effective implementation of the aftercare period would enable these materials to be stored and used for the distribution of end uses identified within the restoration strategy (MA/NL/PA/009). The best practice techniques for the storage and restoration of these types of soil resources has been widely and successfully applied across surface mining sites in Wales and England.
- 9.182 It is therefore assessed that for the mineral soils, on the completion of the aftercare period there would be a low magnitude of impact on soil resources, based on limited losses of materials during the process of soil stripping, storage and handling, on soils that are considered to be of low sensitivity due their susceptibility to wetness. Overall, the effect on non-peaty soil resources at the end of the aftercare period is therefore assessed to be of **minor adverse significance**.
- 9.183 With regard to the clayey soils with a peaty surface, the draft soil handling methodology for peaty soils has been developed taking into account best practice guidance available, examples of other development sites in Wales and Scotland where peaty soils are being stored and handled and

consultation advice. However, it is recognised that these peaty soils are sensitive materials and are susceptible to damage and losses when disturbed.

- 9.184 Therefore, whilst the successful implementation of the soil handling methods and the ecological restoration and aftercare strategy for these areas should lead to the effective redevelopment of the soil profiles and habitats in this area, it is assessed that a loss of a proportion of these sensitive materials may result from operations taking place on the main site. It is therefore assessed that following aftercare there would be a medium magnitude of impact on the shallow peat resource, which is considered to be of moderate sensitivity. The overall effect on these clayey soils with a peaty surface is therefore considered to be of **moderate adverse significance**.

Decommissioning of Cwmbargoed Disposal Point

- 9.185 The restoration of the CDP to the east of the railway line to its former use as agricultural land would be carried out using the soil resources that are currently available within the bunds that lie along the boundary of the facility, and which could be used to restore this area of approximately 20ha of land. The decommissioning of the CDP is required upon completion of the FLRS scheme in any event and would therefore have no additional effect on soil resources.

Main Site - Agricultural Land Quality

Site establishment and dispositions 1 to 5

- 9.186 The quality of the agricultural land within the areas affected during the site establishment and operational phases can be graded no higher than Grade 4, according to a severe climatic limitation, with the majority of the site graded 5 due to a severe wetness limitation. None of the area therefore affects any area of the “best and most versatile” grades 1, 2 or 3a land, but instead would affect some of the lowest quality grade 4 and 5 upland, which is severely limited in agricultural potential.
- 9.187 In addition, the proposed soil handling methodologies for mineral and clayey with a peaty surface soils have been developed in order to retain the available soil resources within the site for reinstatement of agricultural land as part of the overall restoration strategy.
- 9.188 The magnitude and sensitivity of this land, in terms of its agricultural land quality are therefore assessed to be negligible and the overall impact of the proposal on agricultural land quality is therefore assessed to be of **negligible long term temporary significance**.

Land Remediation Works

- 9.189 The small areas of soil disturbance associated with the proposed remedial works would similarly lead to a limited disturbance to the agricultural land quality within these areas. As the quality of the land is predominantly poor grade 4 land within these areas, the sensitivity of this resource and the magnitude of the impact on it are both assessed to be negligible. The significance of the effect of these remediation works on agricultural land quality is therefore assessed to be of **negligible medium term temporary significance**.

Land Restoration and Aftercare

- 9.190 The implementation of the restoration strategy, including the reclamation of agricultural grassland as indicated on Drawing MA/NL/PA/009 and the use of soil handling methodologies as outlined in Appendix MA/NL/ES/09/002 and 003 would enable agricultural use of the land to be re-established in the long term. The residual effect of the implementation of the scheme including its restoration and aftercare on agricultural land quality would be **negligible significance** based on

a negligible magnitude of effect and the negligible sensitivity of receptor which comprises grade 4 and 5 land.

Decommissioning of Cwmbargoed Disposal Point

- 9.191 The decommissioning of the CDP and the restoration of the site to agricultural land use would involve the use of soils currently stored on the periphery of the area and is required upon completion of the FLRS in any event. The effect of this on agricultural land quality would be of **negligible significance** based on a negligible magnitude of effect and the negligible sensitivity the receptor would have; it being originally comprised grade 4 land at best, based on an overall climatic limitation.

Main Site – Farm Holdings

Site establishment and dispositions 1 to 5

- 9.192 Two farm holdings would be affected by the site establishment and operational phases within the main site as shown on Figure MA/NL/ES/09/005. The temporary loss of land from Holding 1 would include approximately 78ha of land owned as part of the farm enterprise, together with 21 ha farmed by agreement with the landowner. The farmer affected has reached an agreement with Miller Argent over the use of the land and has indicated the intention to continue to operate the remainder of the holding, on a reduced basis, during the lifetime of the project.
- 9.193 With regard to Holding 2, the area of land within the scheme is mainly farmed on the basis of a short-term agreement with the landowner, with only a 0.7 ha falling within the ownership of the holding, and is a piece of grazing land that lies at some distance from the main holding.
- 9.194 The effects on these holdings during the establishment operations are assessed to have a medium magnitude of effect, with a single farm holding potentially rendered unworkable. The sensitivity of the holdings is assessed to be low, based on the nature of the operations on this upland sheep and beef based enterprise and the low quality of the agricultural land affected. The significance of the operations on the farming framework would therefore be at a local level and is assessed to be of **minor adverse long term temporary significance**.

Land Remediation Works

- 9.195 The remedial works would affect a strip of land along the eastern side of the site adjacent to the Heads of the Valleys Industrial Estate that lies outside the boundary of the Gelligaer & Merthyr Common. This would include land within the two farm holdings also affected by the main operational area.
- 9.196 Although there would be a short term disruption to the use of the land during the remediation of this area and it may not be possible for grazing to continue uninterrupted, the land could be returned to agricultural use on completion of the remediation works, which would be within two years of operations commencing.
- 9.197 The sensitivity of these areas of grazing is assessed to be low, based on the low agricultural quality of the land and the livestock based enterprises that use it as offlying areas of land to the main holdings, and the magnitude of effect is also assessed to be low as it affects a small area of land within three farm holdings. The overall significance of these remedial works on farm holdings is therefore assessed to be of **minor adverse medium term temporary significance**.

Restoration and Aftercare

- 9.198 Following the restoration of the land within the main site, and the appropriate management of the land during the aftercare period, the agricultural land within the restoration strategy as identified on Drawing MA/NL/PA/009 could be re-integrated into the farming framework. It is intended that all of the restored agricultural land outside and to the north of the Common would be reintegrated into the holding based at Cwm Carno. On the basis that the majority of the site outside of the Common would be successfully restored to an agricultural afteruse and could be reintegrated into the local framework of farm holdings, it is assessed that, following the implementation of the scheme including the restoration and aftercare, there would be a negligible magnitude of impact on farm holdings. Therefore, based on a low level of sensitivity of the holdings affected, the overall residual effect on farm holdings is assessed to be of **negligible significance**.

Decommissioning of Cwmbargoed Disposal Point

- 9.199 Based on the effective re-integration of the land into the common following the aftercare period, it is assessed that there would be negligible magnitude of impact on an agricultural resource considered to be of medium sensitivity. The overall effect on the agricultural use of the common following the effective implementation of the aftercare period is assessed to be of **negligible permanent significance**.

Agricultural Use of the Gelligaer and Merthyr Common

Site establishment operations and dispositions 1 – 5

- 9.200 A total of approximately 201 hectares of the land affected by the site establishment and operational stages of the mine forms part of the Gelligaer and Merthyr Urban Common (CL38). Of this area approximately 188.7 ha is available for agricultural grazing, excluding the area of Rhaslas Pond. The total area of 201 ha represents approximately 6.5% of the total area of the Gelligaer and Merthyr urban common (3090 hectares). In the northern part of the Gelligaer and Merthyr Urban Common, a further approximate 197 hectares are affected by the FLRS and the Trecatti Landfill, which are assessed under cumulative effects below.
- 9.201 Also, an area of urban common land to the west of the area of the main operation would be temporarily affected during the preliminary operations, identified as Area 3 on Figure MA/NL/PA/035, as the existing overhead power lines across the main operational site would be diverted within this area prior to the commencement of mining. Once these initial works have been completed the right to graze this area, totalling approximately 25ha would be available and would continue through the lifetime of the Project.
- 9.202 The project proposals include the provision of areas of temporary grazing land that would be available for use by those commoners with grazing rights throughout the life of the project. These areas include approximately 6ha of land west of Bryn Caerau (Area 9), approximately 25ha of land east of Pentrebach (Area 11) and approximately 50ha of land at Penddeugae (Area 12). In total, therefore, approximately 81ha of temporary grazing land would be made available.
- 9.203 With the exception of Miller Argent, who as the single largest Commoner does not exercise their rights to graze the Common, there are no restrictions on the potential for all other commoners to use the Common for grazing in accordance with their registered rights. However, it is understood that there are only a limited number of commoners (seven) who currently regularly use the land affected within the main site as part of their farming operations. This includes the owner of the land, whose farm holding on the northern part of the main site would be affected by the operations and who does not object to the scheme and is in agreement with Miller Argent over their reduced use of their holding and the common land for the duration of the proposed operations.

- 9.204 The agricultural quality of the land within the area of common land affected is poor (grade 4 land) or very poor (grade 5 land). The natural soil resources are dominated by heavy textured and poorly drained clayey soils or clayey soils with peaty topsoil horizons. The remaining areas of the common affected comprise previously disturbed or worked and tipped areas of land, where there are no recoverable natural soil resources remaining.
- 9.205 Whilst the quality of the land is poor or very poor within the areas of common land affected, the effects on the agricultural use of the land are assessed to be of medium sensitivity, based not only on the limited numbers and types of enterprises who not only actively use the common but also those who have grazing rights on the common, who are greater in number.
- 9.206 The provision of alternative grazing areas comprising a total of approximately 81 ha of land during the operation would provide areas of good quality improved grassland to the commoners. The inherent quality of the agricultural land within the additional areas is generally of better quality than the areas of grazing lost on the Nant Llesg site, where there are limited natural soil resources due to the extent of previous mining disturbance and areas of low capacity grazing land where clayey soils with peaty topsoils are located. Without the provision of these additional grazing areas it is assessed that the overall magnitude of impact on the grazing capacity of the common would be medium and based on a medium sensitivity of this land, the effect would be of moderate adverse significance. However, the addition of the additional areas of predominantly good quality improved grassland to the common would reduce the magnitude of impact on the common to low and therefore the significance of effect of the loss of grazing capacity within the common as a whole from moderate to **long term temporary minor adverse**.
- 9.207 There are however a number of individual commoners who are more specifically affected by the temporary loss of the common within the project. Whilst the common is unstinted and commoners have rights to graze all areas of the common, it is recognised that there are at least seven commoners in the vicinity of the Nant Llesg project who use this area of land on a regular basis for grazing livestock. Although the additional areas provided (Areas 9, 11 and 12) would be available to these commoners, they are located at some distance from the existing areas of the Nant Llesg project and are separated from the current grazing area by the railway line that runs north-south to the west of the CDP. It is therefore assessed that, even taking into account the additional temporary areas, for those individual commoners who use the area of land at Nant Llesg on a regular basis, the loss of the common at Nant Llesg could affect the day to day operation of these individual enterprises. The magnitude of the effect on the individual enterprises is assessed to be of low to medium magnitude.
- 9.208 Based on the low to medium effect on the individual farming enterprises affected and the medium sensitivity of this land it is therefore assessed that the effect of site establishment and operational stages of the Nant Llesg project on the local structure of farm holdings which use the Nant Llesg area on a regular basis would be of **long term temporary minor to moderate adverse significance**.

Land Remediation Areas

- 9.209 Remedial works would take place in specific targeted areas within approximately 54ha of urban common land to the south of South Tunnel Road and a further 3.5ha of land to the west of the Industrial Estate on the eastern edge of the site, identified as part of Area 4 and Area 5 on Figure MA/NL/PA/035.
- 9.210 It would be necessary, for purposes of public safety, to temporarily fence areas where remedial works are being undertaken. However, the majority of the common land surrounding where these works are necessary would remain unaffected by the temporary operations and would be available for grazing by the commoners. Once the works are completed within the first 2 years from the commencement of operations, grazing would be available across the whole of these areas.

- 9.211 It is therefore assessed, that there would be a negligible magnitude of impact on the agricultural use of the common resulting from these works. Based on the moderate sensitivity of the common land for agricultural use, the overall effect of these works on the common are assessed to be of **negligible medium short term significance**.

Land Restoration and Aftercare

- 9.212 Following the implementation of the restoration strategy as described in Section 5 of the Planning Statement, and the aftercare period, the areas of common land affected during the operational period of the mine would all be available to graziers of the Gelligaer and Merthyr common. The successful reinstatement of the common land using all of the soil resources that have been identified in detail by the site survey work would enable the common to be returned to its former use for grazing.
- 9.213 In addition, the proposals include the restoration of the strip of Merthyr Industrial Services land currently used as a landfill site that runs northwards from the South Tunnel Road towards the eastern side of Rhaslas Pond to grassland. It is intended that, on completion of the aftercare period, this would also be registered as common.
- 9.214 Based on the effective re-integration of the land into the common and the improvement and registration of the Merthyr Industrial Services land as common land following the aftercare period it is assessed that there would be negligible magnitude of impact on an agricultural resource considered to be of medium sensitivity. The overall effect on the agricultural use of the common, following the effective implementation of the aftercare period, is assessed to be of **negligible permanent significance**.

Decommissioning of the Cwmbargoed Disposal Point

- 9.215 The area of the CDP would be restored using the soil materials currently located on the periphery of the area and proposals to restore this land currently form part of the FLRS scheme.
- 9.216 Based on the effective re-integration of the land into the common following the aftercare period, it is assessed that there would be negligible magnitude of impact on this agricultural resource considered to be of medium sensitivity. The overall effect on the agricultural use of the common following the effective implementation of the aftercare period is assessed to be of **negligible permanent significance**.

Additional Areas

West of Pontlloftyn (Area 7)

- 9.217 This area is proposed to be used for temporary public access during the lifetime of the project. Whilst facilities including, for example the provision of additional stiles, may be provided within this area to enable public access across the land, there are no proposals to change current farming framework of fields or gates across the area.
- 9.218 The proposals would not, therefore have any effects on the physical characteristics of the land and would not affect the soils and agricultural land quality across the area. The soils and agricultural land quality of this area would therefore remain suitable for use as agricultural grazing land throughout the lifetime of the project.
- 9.219 This area of land, which lies at some distance from the main area of the holding around the farm at Troedrhifwuch is currently being grazed by sheep and the maintenance of the field pattern and existing gates would enable this land use to continue throughout the lifetime of the project. It is therefore assessed, that whilst there would be public access available across an area of the

current farming operation, where none existed before, that the magnitude of that change would be low on a farming framework assessed to be of negligible sensitivity, based on the likely effects on a single farm holding. The overall effect of the temporary use of this land for public access on the farming framework would therefore be of **negligible long term temporary significance**.

South of Pontlottyn (Area 8)

- 9.220 This area is proposed to be used for temporary public access during the lifetime of the project. Whilst facilities including, for example the provision of additional stiles, may be provided within this area to enable public access across the land, there are no proposals to change current farming framework of fields or gates across the area. There are two footpaths that currently cross the northern and southern tips of the area, although the southern path crosses a very steep section of the area.
- 9.221 The proposals would not, therefore have any effects on the physical characteristics of the land and would not affect the soils and agricultural land quality across the area. The soils and agricultural land quality of this area would therefore remain suitable for use as agricultural grazing land throughout the lifetime of the project.
- 9.222 The land is currently being grazed by sheep and the maintenance of the field pattern and existing gates would enable this land use to continue throughout the lifetime of the project. It is therefore assessed that, whilst there would be potential for increased access across this area of the current farming operation, in addition to the existing footpaths, the magnitude of that change would be negligible on a farming framework assessed to be of low sensitivity, based on the likely effects on a single farm holding. The overall effect of the temporary use of this land for public access on the farming framework would therefore be of **negligible long term temporary significance**.

West of Bryn Caerau (Area 9)

- 9.223 This area is proposed to be used for temporary access and grazing during the lifetime of the project. Whilst facilities including, for example the provision of additional stiles, may be provided within this area to enable public access across the land, there are no proposals to change current farming framework of fields or gates across the area.
- 9.224 The proposals would not, therefore have any effect on the physical characteristics of the land and would not affect the soils and agricultural land quality across the area.
- 9.225 The land has been previously used, by arrangement with the owner, for grazing and remains suitable for that purpose. However, as it is not currently being actively used as part of a farm holding, its use for temporary grazing as part of the project would have no effect on the current framework of farm holdings.

Bryn Caerau –Biodiversity/compensation Area (Area 10c)

- 9.226 The project includes the proposal to create an area of ecological compensation on this land. The proposals include the planting of woodland and creation and enhancement of ecological habitats within the area. These proposals would not have any effects on the physical characteristics of the land and would not affect the soils and agricultural land quality across the area.
- 9.227 Within this area there would be parcels of land that would still be available for grazing as part of the farm holding at Bryn Caerau and, following the implementation of the proposals the entire ecological compensation area would remain as part of the overall Bryn Caerau farm holding. The area of the land identified as the biodiversity area is not intensively used as part of the overall farm holding, with the most productive areas based around the farm itself, identified as areas 10a and 10b. It is therefore considered that the implementation of the ecological proposals in this area would have a **negligible long term permanent effect** on the structure of farm holdings.

Bryn Caerau – Area 10 (a and b)

- 9.228 These areas comprise predominantly improved grassland and are actively grazed as part of the farm holding based at Bryn Caerau, It is not proposed that they should be used as temporary grazing or access land as part of the Project and therefore the proposals have no effect on soils, agricultural land quality or the operation of the farm holding,

Land East of Pentrebach (Area 11)

- 9.229 This area is proposed to be used for temporary grazing and public access during the lifetime of the project. Whilst facilities including, for example the provision of additional stiles, may be provided within this area to enable public access across the land, there are no proposals to change current farming framework of fields or gates across the area.
- 9.230 The proposals would not, therefore have any effect on the physical characteristics of the land and would not affect the soils and agricultural land quality across the area. The soils and agricultural land quality of this area would therefore remain suitable for use as agricultural grazing land throughout the lifetime of the project.
- 9.231 This area of land is used as a supplementary area of grazing to the main holding which lies approximately 2km to the north of the land, on the basis of a short term tenancy agreement. The farm holding which currently uses the land can continue to graze the land as a commoner during the lifetime of the project. The impact of the loss of this isolated piece of land, surrounded by existing common land during the lifetime of the project is assessed to be of low magnitude, having a limited effect on a single farm holding in an area of negligible sensitivity. Therefore the effect of the use of this land for temporary grazing on the farming framework is assessed to be of **negligible long term temporary significance**.

Land at Penddeugae (Area 12)

- 9.232 This area is proposed to be used for temporary grazing and public access during the lifetime of the project. Whilst facilities including, for example the provision of additional stiles, may be provided within this area to enable public access across the land, there are no proposals to change current farming framework of fields or gates across the area.
- 9.233 The proposals would not, therefore have any effect on the physical characteristics of the land and would not affect the soils and agricultural land quality across the area. The soils and agricultural land quality of this area would therefore remain suitable for use as agricultural grazing land throughout the lifetime of the project.
- 9.234 The land is actively grazed with both sheep and cattle as part of a larger holding based to the south of the area at Cascade Farm, Penpedairheol. Although, as a commoner this farmer would still be able to use this land for grazing he would not have sole access to the land as he does now. The provision of this land as temporary grazing could therefore affect the day to day management of this individual holding during the temporary grazing period. This magnitude of this impact is assessed to be low, based on the effects on this single farm holding and the sensitivity of the effect is assessed to be negligible to low, based on the quality of the improved grassland in this area and the nature of the farming enterprise. Overall, therefore the effect of the provision of this area as temporary grazing land is therefore assessed to be **negligible to minor adverse long term temporary significance** on the framework of farm holdings.

Environmental Assessment: Cumulative Effects

9.235 The cumulative effects assessment includes consideration of the following schemes:

- Ffos-y-fran Land Reclamation Scheme
- Trecatti Landfill Site

9.236 There are two areas of the Cwmbargoed Disposal Point which lie within the county borough of Merthyr Tydfil. The area to the north-west comprises in part a small area of undisturbed open grassland that is fenced outside the operational area of the CDP and that will remain the case. The western part of this land is urban common and grazing is allowed in this area despite the land being subject to the Gelligaer and Merthyr Commoners Association “New Objection 38 Agreement” where the commoners have waived their right to graze the Common. The area to the south includes part of the CDP water treatment and an area for coal stocking and comprises non-agricultural land. Overall, there is not considered to be any likely cumulative effects on soils, agricultural land quality or farm holdings associated with the small area of agricultural land located to the west of the operational CDP and it is not therefore included in the cumulative assessment.

Ffos-y-fran Land Reclamation Scheme

9.237 The FLRS is the largest of the original three phases of the East Merthyr Reclamation Scheme and, on completion, would restore 367 hectares of derelict land, including around 197 hectares of urban common in the northern part of the Gelligaer and Merthyr Urban Common. The reclamation works include the removal of known shafts and adits previously associated with iron ore and coal workings, as well as the removal of fly tipping and many burnt out and stolen cars from the site. Works on site commenced in June 2007 and will continue for a further 17.5 years until 2024. Following restoration there would be an after-care period of at least 5 years.

9.238 The principal aim of the FLRS as described on the project website (<http://www.millerargent.co.uk/restoration>) is *“to progressively restore the land to its former use, to a simple landform and landscape, characteristic of this area; void of dereliction, and incorporating certain features retained for various reasons throughout site operations; and recreating others that are presently considered to be of notable interest. A number of enhancements are also planned for the site to complement the original uses..*

9.239 The Commoners (represented by the Commoners Association), signed an agreement in 1998 with Celtic Energy, to voluntarily suspend their grazing rights to the 197ha of land within the FLRS scheme for the duration of operations. The agreement also included the granting of grazing rights to each of the Commoners over an additional 47ha of land, outside the boundary of the existing common, none of which is now being offered as additional grazing and/or access land. The area of common land would be reinstated following completion of the after-care by 2029, with some areas being available prior to that date following early restoration works.

9.240 The FLRS and the project would therefore affect nearly 400 hectares of urban common land, amounting to nearly 13% of the total area of the Gelligaer and Merthyr Urban Common. It is anticipated that the majority of the urban common affected by the project would be reinstated by 2032 after a minimum 5 years of after-care. There would therefore be a period of around 4 years when the combined area of common land affected by the two projects would be reduced to around 200 hectares.

Trecatti Landfill Site

9.241 Trecatti is an operational landfill site which is safeguarded under the Merthyr Tydfil County Borough Council (MTCBC) Local Development Plan Policy AS7 for unavoidable waste. It is acknowledged that by MTCBC that “The demanding requirements of the National Waste

Strategy and EU Directives have resulted in a shift from sending waste to landfill to managing it in a more sustainable manner. This new approach requires waste to be reduced at source and then treated as resource through re-use, recycling, composting and energy recovery". This has inevitably resulted in reduced need for landfill. It is therefore expected that the Trecatti site will remain in operation for unavoidable waste at least until after the completion of both the FLRS and the project.

- 9.242 Trecatti is located on the Gelligaer and Merthyr urban common and the rights of grazing 34.9 hectares are suspended as a result of the current operations and will remain suspended for the life of the landfill site.

Cumulative Effects

- 9.243 The cumulative effect on land use and soils arising from the implementation of the project is the loss of common land grazing in addition to those areas of the Merthyr and Gelligaer common already affected by the FLRS and Trecatti schemes.

- 9.244 The three schemes in total affect a maximum of approximately 435 ha of urban common, mostly located within the northern area of the Gelligaer and Merthyr Urban Common, where grazing rights are suspended. However, whilst the implementation of the project would lead to the additional temporary suspension of common land in the northern part of the Common, there are a number of factors that should be taken into account in the assessment of the significance of the cumulative effect of this additional temporary loss:

1. The Commoners Association, has an existing agreement in place with regards to FLRS to voluntarily suspend their rights to the common across this area
2. The Commoners Association are in negotiation with MA to voluntarily suspend their rights to the common across the area of the site. Therefore, whilst a number of individual farmers would have to make adjustments to their farming practices, the agreement will illustrate that changes in farming practices can be accommodated in the local area during the lifetime of the project;
3. Agreements between MA and individual commoners who regularly use this area of the Common affected by Nant Llesg will include an agreed proportionate reduction in grazing rights on the remaining area of the Common during the life of the scheme. The FLRS agreement between Miller Argent and the Commoners Association included the permanent provision of 47 ha of grazing land to the Commoners Association;
4. The project includes the provision of a total of approximately 81 ha of temporary grazing land for use by the commoners throughout the life of the scheme;
5. The project includes the provision of a proposed permanent addition of 11.53ha to the Merthyr and Gelligaer Urban Common.
6. Miller Argent, the largest landowner within the Merthyr and Gelligaer Urban Common, has suspended all of its grazing rights across the common.

- 9.245 The implementation of suitable voluntary agreements with individual commoners to control stocking ratios on the remaining areas of the common together with the provision of 81ha of temporary grazing land during the operational period would enable the potential cumulative effect on the grazing capacity on the common to be reduced as far as possible. However, the temporary loss of FLRS, Nant Llesg and Trecatti would be likely to result in adjustments in the

day to day management of individual farm holdings and potential changes to the structure of farming in the wider local area. It is therefore assessed that the magnitude of the cumulative impact on farm holdings would be likely to be low to medium, depending on the nature of the individual enterprises that are affected by the three schemes. Based on the medium sensitivity of the common land the cumulative effect on the agricultural use of the common is assessed to be of **long term temporary minor to moderate adverse significance**.

Inter-relationships and in-combination effects

9.246 There are no additional inter-relationships with other topics that have not already been described within this chapter.

Summary and Conclusions

9.247 The agricultural and soil resources present within and in the vicinity of the site have been identified through desk study and surveys. The effects of the Nant Llesg proposals on agricultural land quality, soils, farm holdings and the agricultural use of Merthyr and Gelligaer Common have been assessed taking into account measures to avoid or reduce the effects which are integral to the design of the project and which will be secured as part of the proposal.

9.248 For the purposes of the assessment, the land take of the scheme as a result of site clearance and the working of the site are considered first. In practice, all of the land would be taken out of agricultural use and a high proportion of soil disturbance would take place in the early stages of working as a result of clearing and stripping the land required for the soil and overburden stores, and the initial box cut, as well as the areas for the site offices, workshops and other facilities. Since most of the land take occurs in the early stages of the scheme there is little to be gained from assessment of the effects of the land take for individual stages of the scheme separately, and thus the effects of the overall land take are assessed together.

9.249 During the operational phase of the mining operation there are not anticipated to be any additional effects on agricultural land use or soil resources. Following the completion of mining operations on site, the Restoration Strategy forms the basis for the assessment of the effects of the restoration of the site. This strategy includes an identification of soil resources to be used in the restoration of the site and the identification for the appropriate methods of soil handling to be implemented for the different soil types that exist within the site.

Key Findings

Soils and Agricultural Land Quality

9.250 The detailed soil and agricultural land classification survey of the land likely to be disturbed by the implementation of the project has found that approximately 41% of the land to have been previously disturbed by firstly iron scouring and subsequently by surface mining and tipping operations. The remaining land which would be stripped of soils as part of the operation comprises natural soil profiles. Approximately 64.9ha of this land contains soils with peaty topsoils.

9.251 The quality of the agricultural land is limited to grade 4 due to a severe climatic limitation, or grade 5 due to a severe soil wetness limitation. No areas of the “best and most versatile” grade 1, 2 or 3a agricultural land are therefore affected by this proposal. It is therefore assessed that there would be a long term temporary negligible effect on agricultural land quality, based on the

agricultural land classification of the project area and the comprehensive soil management and restoration proposals submitted as part of the project.

- 9.252 For the non-peaty mineral soil resources stripped as part of the project, the implementation of the proposed soil handling methods and the effective implementation of the aftercare period would enable these materials to be maintained and used for the distribution of end uses identified within the restoration strategy (MA/NL/PA/009). The best practice techniques for the restoration of these types of soil resources has been widely and successfully applied across surface mining sites in Wales and England.
- 9.253 It is therefore assessed that for the non-peaty mineral soils, on the completion of the aftercare period there would be a low magnitude of impact on soil resources, based on limited losses of materials during the process of soil stripping, storage and handling, on soils that are considered to be of low sensitivity due their susceptibility to wetness. Overall, the effect on non-peaty soil resources at the end of the aftercare period is therefore assessed to be of permanent **minor adverse significance**.
- 9.254 With regard to the clayey soils with a peaty surface, the draft soil handling methodology for peaty soils has been developed taking into account best practice guidance available, examples of other development sites in Wales and Scotland where peaty soils are being stored and handled and consultation advice. However, it is recognised that these peaty soils are sensitive materials and are susceptible to damage and losses when disturbed.
- 9.255 Therefore, whilst the successful implementation of the soil handling methods and the ecological restoration and aftercare strategy for these areas should lead to the effective redevelopment of the soil profiles and habitats in this area, it is assessed that a loss of a proportion of these sensitive materials may result from operations taking place on the main site. It is therefore assessed that following aftercare there would be a medium magnitude of impact on the shallow peat resource, which is considered to be of moderate sensitivity. The overall effect on these clayey soils with a peaty surface is therefore considered to be of permanent **moderate adverse significance**.

Farm Holdings

- 9.256 The operational area of the project would affect two farm holdings outside the boundary of the Merthyr and Gelligaer Common. One farm is using land on the eastern side of the project area, predominantly as grazing land on the basis of a short term agreement with Miller Argent, with a small area also owned as part of the holding. The land is located at some distance to the main holding and the loss of this grazing land, mainly used on a short term basis, would not be likely to affect the day to day management of the overall farming enterprise.
- 9.257 The second farm is situated at Cwm Carno, to the north of the Nant Llesg project. Approximately 99ha of land (owned and tenanted) is affected by the project. This would render this holding unworkable in its current form. However the farmer affected is in agreement with Miller Argent over the use of the land and has indicated the intention to continue to operate the holding, on a reduced basis, during the lifetime of the project.
- 9.258 The effects on these holdings during the operational period would therefore have a medium magnitude of effect, with a single farm holding potentially rendered unworkable for the duration of the project. The sensitivity of the holdings is assessed to be low, based on the nature of the operations and the quality of the agricultural land affected. The significance of the operations on the farming framework would therefore be at a local level and is assessed to be of **minor adverse long term temporary significance**.

Agricultural Use of the Common

- 9.259 A total of approximately 201 hectares of the land affected by the site establishment and operational stages of the mine forms part of the Gelligaer and Merthyr Urban Common (CL38). Of this area approximately 188.7 ha is available for agricultural grazing, excluding the area of Rhaslas Pond. The total area of 201 ha represents approximately 6.5% of the total area of the Gelligaer and Merthyr urban common (3090 hectares).
- 9.260 Also, there would be limited short terms works to areas of common surrounding the operational area during the first 2 years of the project. These would include firstly an area of urban common land to the west of the area of the main operation would be temporarily affected during the preliminary operations, as the existing overhead power lines across the main operational site would be diverted within this area prior to the commencement of mining. Once these initial works have been completed the right to graze this area, totalling approximately 25ha would be available and would continue through the lifetime of the Project.
- 9.261 There would also be beneficial remediation works carried out in targeted areas of common land to the east (3.4ha) and south of the operational area to the south of South Tunnel Road (54ha). The overall effects of these targeted works, which would be limited in area, **are assessed to be of negligible medium short term significance**
- 9.262 The project proposals include the provision of areas of temporary grazing land that would be available for use by those commoners with grazing rights throughout the life of the project. These areas include approximately 6ha of land west of Bryn Caerau, approximately 25ha of land east of Pentrebach and approximately 50ha of land at Penddeugae. In total, therefore, approximately 81ha of temporary grazing land would be made available.
- 9.263 Whilst the quality of the land is poor or very poor within the areas of common land affected, the effects on the agricultural use of the land are assessed to be of medium sensitivity, based on the numbers and types of enterprises who not only actively use the common but also those who have grazing rights on the common.
- 9.264 The provision of alternative grazing areas comprising a total of approximately 81 ha of land during the operation would provide areas of good quality improved grassland to the commoners. The inherent quality of the agricultural land within the additional areas is generally of better quality than the areas of grazing lost on the Nant Llesg site, where there are limited natural soil resources due to the extent of previous mining disturbance and areas of low capacity grazing land where clayey soils with peaty topsoils are located. Without the provision of these additional grazing areas it is assessed that the overall magnitude of impact on the grazing capacity of the common would be medium and based on a medium sensitivity of this land, the effect would be of moderate adverse significance. However, the addition of the additional areas of predominantly good quality improved grassland to the common would reduce the magnitude of impact on the common to low and therefore the significance of effect of the loss of grazing capacity within the common as a whole from moderate to **long term temporary minor adverse**.
- 9.265 There are however a number of individual commoners who are more specifically affected by the temporary loss of the common within the project. Whilst the common is unstinted and commoners have rights to graze all areas of the common, it is recognised that there are at least seven commoners in the vicinity of the Nant Llesg project who use this area of land on a regular basis for grazing livestock. Although the additional areas provided (Areas 9, 11 and 12) would be available to these commoners, they are located at some distance from the existing areas of the Nant Llesg project and are separated from the current grazing area by the railway line that runs north-south to the west of the CDP. It is therefore assessed that, even taking into account the additional temporary areas, for those individual commoners who use the area of land at Nant Llesg on a regular basis, the loss of the common at Nant Llesg could affect the day to day operation of these individual enterprises.
- 9.266 It is therefore assessed that the effect of site establishment and operational stages of the Nant Llesg project on the local structure of farm holdings which use the Nant Llesg area on a regular basis would be of **long term temporary minor to moderate adverse significance**.

9.267 The restoration of the land in accordance with the restoration strategy and the effective implementation of the aftercare period would enable the land to be effectively re-integrated into the common. Based on the successful restoration, the residual effect on the agricultural use of the common following the aftercare period is assessed to be of **negligible permanent significance**.

Mitigation

9.268 No further mitigation measures are proposed beyond the measures that have been adopted as part of the project, including the restoration and aftercare strategy and provision of additional grazing land for the lifetime of the project.

Residual Effects

9.269 The effects described under the key findings above are the residual effects taking into account the measures that have been adopted as part of the project.

Cumulative Effects

9.270 The cumulative effect on land use and soils arising from the implementation of the project is the loss of common land grazing in addition to those areas of the Merthyr and Gelligaer common already affected by the FLRS and Trecatti schemes.

9.271 The three schemes in total affect a maximum of approximately 435 ha of urban common, mostly located within the northern area of the Gelligaer and Merthyr Urban Common, where grazing rights are suspended. The implementation of suitable voluntary agreements with individual commoners to control stocking ratios on the remaining areas of the common together with the provision of 81ha of temporary grazing land during the operational period would enable the potential cumulative effect of the Nant Llesg project on the grazing capacity on the common to be reduced as far as possible. However, the temporary loss of common due to FLRS, Nant Llesg and Trecatti would be likely to result in adjustments in the day to day management of individual farm holdings and potential changes to the structure of farming in the wider local area. It is therefore assessed that the magnitude of the cumulative impact on farm holdings would be likely to be low to medium, depending on the nature of the individual enterprises that are affected by the three schemes. Based on the medium sensitivity of the common land the cumulative effect on the agricultural use of the common is assessed to be of **long term temporary minor to moderate adverse significance**.

Conclusions

9.272 The implementation of the proposed restoration and aftercare scheme would enable the agricultural land to be successfully reintegrated into the Merthyr and Gelligaer Common and the individual farm holdings that lie outside the boundary of the common.

9.273 The mineral soil resources identified within the project would be stripped stored and restored in accordance with recognised best practice methods and following the aftercare period the effect on these resources would be negligible. Techniques for the handling and restoration of the peaty soils have also been developed as part of the project. However, it is recognised that these are sensitive soils, where there may be a residual loss of a small proportion of the peat resource and where the proposed wet heath habitats would take a long time to recover.

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Nant Llesg Surface Mine

Incorporating Land Remediation

Chapter 10

Hydrogeology

Nant Llesg Surface Mine

Incorporating Land Remediation

Environmental Statement

Chapter 10 - Hydrogeology

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10 Hydrogeology

Chapter Overview

- 10.1. The bedrock in the area of the Nant Llesg site comprises Lower and Middle Coal Measures strata which are made up of alternating mudstones, siltstones and sandstones with intermittent coal seams and ironstone units. Drilling investigations of the Nant Llesg site have indicated a relatively consistent stratigraphy, with the strata dipping steadily south-south-eastwards at angles between 3° and 9°, with minor faulting trending north-northwest to south-southeast. Overlying, superficial deposits comprise variable thicknesses of a range of materials, namely gravels, clays, sand and made ground, as well as areas of opencast backfill in areas worked for coal in the past.
- 10.2. The Coal Measures strata in the area are classified as a secondary A aquifer (formerly classified as minor aquifer). Such aquifers are often capable of supporting water supplies at a local scale, but there are no licensed groundwater abstractions or private water supplies in the near vicinity of the proposed development. Overall groundwater use in the area is minimal; although groundwater does provide a contribution to flow in the River Rhymney.
- 10.3. In addition to the typical heterogeneity of Coal Measures strata and the influence on groundwater flow by the existence of old coal and ironstone workings, an underground artificial drainage network heavily influences the local groundwater flow regime. This drainage system, which was developed in the 18th and early 19th centuries, comprised a complex system of water collection ditches, canalised streams and a series of stone-lined culverts. This is called the Dowlais Free Drainage System (DFDS), and was developed partly to provide a water supply to the ironworks at Dowlais and Rhymney and partly to drain underground mine workings. It is still functional at depth and dominates groundwater movement in the area.
- 10.4. Groundwater level monitoring data indicate that groundwater levels can be over 100 m below ground level, and are often associated with the elevation of the DFDS. The inferred eastward direction of groundwater flow beneath the planning application site is also largely controlled by the DFDS and its discharge into the Bute Watercourse, which itself discharges into the River Rhymney within a culvert which runs through the town.
- 10.5. The quality of groundwater in the area is quite poor, with elevated concentrations of several metals, including iron, manganese and zinc. Similarly, water quality associated with the DFDS is poor and causes some deterioration in the river water quality. Indeed, the DFDS discharge is currently considered the second worst unmitigated discharge in Wales by the Environment Agency (EA).
- 10.6. Dewatering of the void is likely to be required to maintain dry working conditions, although this may only be required once excavations have reached considerable depth. This would involve pumping a combination of surface water and groundwater to water treatment areas at the surface, before discharge to the River Rhymney. The effects of dewatering on local groundwater levels have been considered and are expected to be limited, and reversed on restoration. The water treatment would provide a temporary, but long-term and significant, benefit with respect to river water quality, whilst the removal of coal strata and the implementation of an approved backfill strategy as part of site restoration would provide a longer-term permanent water quality benefit. It is important to note that the Coal Authority currently consider that at the present time remediation of the DFDS discharge is otherwise *“probably infeasible mainly due to health and safety concerns of entering the river culvert to capture and transfer the water”* (Coal Authority, pers.comm.).
- 10.7. An extensive surface water and groundwater monitoring scheme would be agreed with Natural Resources Wales (NRW, formerly Environment Agency Wales (EAW)) which is anticipated would incorporate existing borehole and stream monitoring locations. This would serve to

monitor the effects of the development and site restoration on local groundwater levels and surface water and groundwater quality. Appropriate consents and licences would be obtained from NRW for water management at the site.

Introduction

- 10.8. This section has been prepared by AMEC Environment & Infrastructure UK Ltd (AMEC). It utilises the geological information compiled for the Site Geology section of the Planning Statement, and assesses the potential effects on the local hydrogeology that are predicted to result from the proposed surface mining and land remediation. It also deals with the potential need to treat any pumped groundwater prior to discharge to surface watercourses, and the potential longer-term effects of the restored site in terms of groundwater quality.

Technical Context

- 10.9. Surface coal mining by its nature requires the excavation of geological strata. These strata often constitute groundwater bodies, and where mining extends below the level of the groundwater, dewatering is required to enable the excavation of the coal to take place in safe and dry working conditions.
- 10.10. Dewatering is normally targeted to achieve the removal of water and/or control of water levels across the area of proposed excavation, and particularly in any existing or abandoned underground workings. In the case of Nant Llesg, mining excavations are proposed to be to a maximum depth of 165 m, with dewatering from sumps within the base of the excavation anticipated to be required, supplemented by other pumping as and when appropriate.
- 10.11. A broad range of hydrogeological effects can be associated with surface mining developments such as that proposed at Nant Llesg. These can include the following:
- Change in water infiltration (rate and/or quality) recharging the aquifer;
 - Requirement for dewatering that may reduce groundwater levels, affect the supply of water to abstraction points or springs, or cause subsidence of ground surfaces. Where old mine workings are intercepted, the volumes of water can be large;
 - Groundwater level rebound following the cessation of dewatering; and
 - Alterations to discharges from workings with potential to cause flooding, pollution or contamination of surface water or groundwater resources if not carefully managed.
- 10.12. The effects of groundwater dewatering can potentially extend beyond any surface mine site to also affect the regional and local groundwater system that provides water to wells, springs, streams, lakes, wetlands and groundwater-dependent terrestrial ecosystems (GWDTEs). Where historical mining has taken place, there is also the potential for the existing groundwater to be contaminated, usually with elevated concentrations of metals that are present in coal-bearing strata, and therefore this water may need to be treated before it can be discharged to surface water bodies. The disturbance of the rock strata by mining operations and its temporary storage in overburden mounds also has the potential to increase the contamination risk from metals. Furthermore, the longer-term effects of such material on groundwater, following its placement into the working voids as backfill, also need to be considered.

Relevant Terminology

- 10.13. Some of the more common hydrogeological terminology that has been used in this chapter has been defined as follows:

Controlled waters

- 10.14. Controlled waters are water bodies that require consent from either the NRW (or the relevant local planning authority) for an abstraction, discharge or impoundment from, to or of that water body. Controlled waters include all watercourses, lakes and reservoirs, canals and water contained in underground strata.

Baseflow

- 10.15. Baseflow is the proportion of the flow within rivers and streams that is provided by groundwater. During the winter period, when there is significant surface water runoff, baseflow tends to be a relatively minor proportion of the flow (less than 10%). In contrast, during the summer period of low surface runoff, the baseflow can provide up to 100% of the flow within the river or stream. The average annual percentage of baseflow contribution to a watercourse is represented by the Baseflow Index (BFI).

Groundwater resource

- 10.16. The groundwater resource is the volume of groundwater available for abstraction without significant impact on baseflow, spring flows, groundwater levels, and GWDTEs.

Groundwater quality

- 10.17. Groundwater quality is considered in terms of its impact on both groundwater and surface water receptors.

Springs

- 10.18. Springs are locations where groundwater flows to the ground surface as a result of the intersection of the ground surface with the water table. These often form the start of streams, and can be referred to on Ordnance Survey (OS) maps as 'Issues'. Some springs also comprise private water supplies (PWSs).

Methodology – Assessment Approach

Data Gathering and Survey Work

- 10.19. Extensive knowledge of the planning application site has been gained from the investigation work undertaken in the area by Miller Argent and from the development of the existing surface mine to the west at Ffos-y-fran. The investigations at Nant Llesg have included a major phase of drilling to assess mineral reserves and to characterise the site geology; the installation of groundwater monitoring piezometers; the acquisition and review of hydrogeological and hydrological data; and the subsequent factual and interpretative reporting of findings from these investigations.
- 10.20. The other publicly available data and sources of information that have been collated and used in the assessment of hydrogeological baseline and potential effects are listed in Table 10.1. These complement the sources of data that have been obtained for the hydrological assessment, details of which are given in the chapter on hydrology and drainage (Chapter 11).

Table 10.1 Hydrogeology – Public and Other Sources of Information

Topic	Source of Information
Overview	Ordnance Survey (OS) 1:25,000 Map (Sheet 166).
Geology	Memoir of the British Geological Survey (BGS): Geology of the South Wales Coalfield, Part II, the country around Abergavenny (1989). BGS Sheet 232, Abergavenny. Miller Argent – site investigation data.
Groundwater	
Groundwater Resources	River Basin Management Plan (RBMP) – Severn River Basin District (EA, 2009). NRW – licensed groundwater abstractions. The Coal Authority – local mine drainage. Miller Argent – groundwater level monitoring data.
Groundwater Quality	RBMP – Severn River Basin District (EA, 2009). NRW – local water quality monitoring (mainly surface water). The Coal Authority – local mine drainage quality. Miller Argent – groundwater quality monitoring data.
Groundwater Abstractions and Discharge Consents	Caerphilly County Borough Council (CCBC) – properties with PWS. Merthyr Tydfil County Borough Council (MTCBC) – properties with PWS. NRW – licence and consent records. BGS Geo-Index.
Landfill Sites	NRW – local landfill sites

Proposed Scope of Assessment

10.21. The different types of potential receptor that need to be considered in any hydrogeological impact assessment are summarised as follows (for definition of terms, please refer back to paragraphs 10.13 – 10.18):

- The groundwater resource that lies below the site;
- Any existing underground drainage works;
- Groundwater abstractions;
- Springs;
- Baseflow; and
- Lakes and GWDTEs such as wetlands, bogs and mires.

10.22. Key water features and potential hydrogeological receptors have been identified at the proposed site and for a distance of approximately 3 km beyond the proposed operational site boundary, and are shown in Table 10.2 and on Figure MA/NL/ES/10/001.

Table 10.2 Potential Hydrogeological Receptors

Receptor Reference	Type	Name	Approximate Location
GW1	Groundwater Body	Coal Measures	At excavation
GW2	Underground drainage	Dowlais Free Drainage System Drain (DFDS, Rhaslas Drain)	At excavation
PWS1	PWS	Llechryd	NGR 31080 20948
PWS2	PWS	Princetown	NGR 31128 20998
R1	River Receiving Baseflow	River Rhymney	Bute Town to Pontlottyn

10.23. The hydrogeological features that are to be considered in the hydrogeological assessment include the main groundwater body within the Middle Coal Measures (Lower Carboniferous) Formation underlying the site (GW1), the associated DFDS adit system (GW2, including the

Rhaslas Drain), and the receiving watercourse, the River Rhymney (R1). According to information provided by CCBC and MTCBC, there are also two local PWSs in the area which may be sourced by groundwater, at Llechryd (PWS1) and Princetown (PWS2), approximately 1.3km and 2.0 km respectively to the northeast of the site.

- 10.24. The number of hydrogeological features identified is relatively limited. For example, there are no licensed groundwater abstractions within the search radius of the proposed excavations, only licensed surface water abstractions. There are also very few springs identified on the OS plan covering the local area, and where springs do exist they are considered to result from discharges from shallow perched water bodies in superficial deposits in this upland area rather than from the “regional” groundwater body. The lakes and ponds in the area also appear to be surface water-fed, rather than groundwater-fed. Furthermore, according to NRW (formerly the Countryside Council for Wales (CCW)), there are no statutory designated sites such as Sites of Special Scientific Interest (SSSI) or Special Areas of Conservation (SAC) within the proposed scheme boundary that would be directly affected. Licensed groundwater abstractions, springs, lakes and ponds have therefore all been scoped out of the hydrogeological assessment, although they are considered in the Hydrology Chapter 11.

Potential Significant Effects

- 10.25. The potential significance of an effect resulting from the development is primarily determined by the sensitivity (or value) of a given receptor and the magnitude of the effect. In terms of the hydrogeology, the key determinands of magnitude relate to water quantity and quality.
- 10.26. Sensitivity for hydrogeological receptors is normally related to the relative importance of the groundwater-related feature that might be at risk from effects. For example, a shallow well might be considered to be of local ‘low’ importance, whereas a principal (previously termed major) aquifer would be considered of national ‘high’ importance. More detail about the assessment methodology is provided later in paragraphs 10.85 – 10.91.

Possible Other Effects

- 10.27. Possible other effects from the development include the potential for the drawdown of groundwater to induce subsidence under adjoining land. However, it is considered that current groundwater levels in the area to be developed are well below ground level and do not provide hydraulic support. The risk of such an effect occurring is not considered to be significant, and has therefore been scoped out of the assessment.

Technical Consultations

- 10.28. Technical consultation on the hydrogeology has been conducted with NRW and the Coal Authority. Meetings were held with these organisations to discuss the hydrogeological issues associated with the proposed development on 4 November 2011 and 19 December 2011 respectively.
- 10.29. Furthermore, scoping reports were submitted to CCBC in June 2011 and December 2011, which included details of the proposed approach to be taken with respect to hydrogeology. The latter submission included some additions and alterations to the original scope. The CCBC consultation responses dated 26 August 2011 and 9 March 2012 confirmed the proposed scope.

10.30. In its consultation responses, NRW made comment on a number of issues, including the following information and requests:

- The assessment should give consideration to all known abstractions within or near to the operational site boundary of the proposed development. NRW provided details of existing licensed abstractions (surface water) in the vicinity and advised that unlicensed (e.g. PWS) abstractions may also exist in the area that would need to be considered.
- Dewatering requirements should be considered. The Water Act 2003 provides for the removal of the existing exemption from water abstraction licence regulations for mine and quarry dewatering. Once this legislation is implemented, an abstraction licence would be required for dewatering more than 20 m³/d of groundwater. The effect of dewatering and any lowering of groundwater levels on local groundwater sources must be considered when an application for an abstraction licence is made.
- Consideration should be given to “the shallow flooded mine workings which are stated to exist below Nant Llesg”. An indication of likely volumes to be dewatered, any treatment requirements and discharge arrangements should be considered.
- The potential impact on groundwater quality in relation to backfilling and restoration should also be considered.
- Potential risks to groundwater and surface water receptors from the existing landfill within the proposed development area should also be assessed.

10.31. A supplementary meeting with NRW was held on 3 July 2012 to discuss proposals for the incorporation of the MIS Landfill into the proposed scheme. It was explained that investigations were planned to be carried out in order to characterise the wastes and their pollution potential and, subject to these, appropriate works would be undertaken to engineer and prepare the site to a condition appropriate to be covered by the overburden mound whilst coaling operations take place.

Baseline Environment

Water Framework Directive Setting

10.32. The Nant Llesg site falls within the Water Framework Directive (WFD, Directive 2000/60/EC) surface water body known as “Rhymney R – source to confluence with Nant Bargod Rhymni (GB109057033130)”, and a summary of the WFD status designation is given in Table 10.3. This water body currently has “moderate” ecological status due to the reduced health of the River Rhymney’s fish stocks, although the confidence of this status determination is set out in the RBMP as uncertain. The water body is designated as both a Freshwater Fish Directive protected area and a Drinking Water Protected Area. There is an objective under the WFD to achieve “good” ecological status by 2015.

Table 10.3 Summary information from the RBMP

WFD Criteria	Information Relevant to Nant Llesg site
Water Body ID	GB109057033130
Water Body Name	Rhymney R – source to conf Nant Bargod Rhymni
River Basin District Name	Severn
Catchment Name	South East Valleys
Current Overall Status	Moderate
Ecological Status	Moderate
Ecological Certainty	Uncertain
Chemical Status	Not required
Chemical Status Certainty	Not required
Overall Objective	Good Status by 2015
Ecological Objective	Good Ecological Status by 2015
Chemical Objective	Not required
SSSI (Non-Natura 2000)	No
Hydromorphological Designation	Not Designated A/HMWB
Protected Area	Yes

WFD Criteria	Information Relevant to Nant Llesg site
Drinking Water Protected Area	Yes
Freshwater Fish Directive	Yes
Biological Elements – Fish- Current	Moderate
Biological Elements – Fish- 2015	Good
Supporting Conditions – Hydrology – Current	Not High
Supporting Conditions – Hydrology – 2015	Not High

10.33. Under the WFD, Environmental Quality Standards (EQSs) have been set for surface waters, some of which are hardness-dependent and therefore catchment specific. Hardness Band 6 (>250 mg/l) has been chosen by NRW for hardness-dependent EQSs in this area because the average hardness has been reported to be 335 mg/l for Pontlloftyn Bridge. The surface water quality results have been screened against these standards later (paragraph 10.61).

Geological Setting

- 10.34. Details of the site geology are presented in the Site Geology chapter of the Planning Statement. Summary details are presented here as context to the hydrogeological setting of the site.
- 10.35. The bedrock in the area of the Nant Llesg site comprises Lower and Middle Coal Measures strata which are made up of alternating mudstones, siltstones and sandstones with intermittent coal seams and ironstone units. A generalised vertical section which illustrates the strata within the site area is shown in Drawing MA/NL/PA/041 in Chapter 3 of the Planning Statement. Compared with the Ffos-y-fran site to the west, where the strata are disrupted by a number of large northwest–southeast trending faults, detailed drilling investigations of the Nant Llesg site have indicated that the strata are intersected by minor faults trending north-northwest to south-southeast within a relatively consistent stratigraphy, and with the strata dipping south-southeastwards at angles between 3° and 9°. Overlying, superficial deposits comprise variable thicknesses of a range of materials, including gravels, clays, sand and made ground as well as opencast backfill in areas worked for coal in the past (see Drawing number MA/NL/PA/042).

Hydrogeological Setting

- 10.36. The Coal Measures strata in the area are classified by NRW and BGS as a secondary A aquifer (formerly classified as a minor aquifer). Such an aquifer is described by the NRW as comprising “*permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of baseflow to rivers*”. These are often fractured or potentially fractured rocks that do not have a high primary permeability (hydraulic conductivity).
- 10.37. Whilst Coal Measures strata are typically highly heterogeneous, the local hydrogeological regime at Nant Llesg has been significantly influenced by the existence of old coal and ironstone workings, which are likely to provide preferential flow paths for groundwater movement. Subsidence and settlement as a result of the collapse of old workings may also increase the hydraulic conductivity of overlying strata by causing enhanced fracturing.
- 10.38. In addition to the above features, the artificial drainage network at depth in the Nant Llesg and Ffos-y-fran areas heavily influences the local groundwater flow regime. This drainage system is part of the DFDS, a complex system of water collection ditches, canalised natural streams, tunnels and surface reservoirs constructed in the 18th and early 19th Century. The DFDS was constructed partly to provide a water supply to the ironworks at Dowlais and Rhymney, and partly to drain the underground mine workings. Further details are included in the Cultural Heritage chapter (Chapter 15). With regard to the local hydrogeology, it is the deeper elements of the DFDS that are relevant to this assessment.
- 10.39. The principal deep drains of the DFDS run along the strike of specific seams within the Coal Measures strata, in conjunction with cross-measures drains which allow the groundwater to be moved up through the succession by linking lower seams to overlying seams at shallow gradients contrary to the dip of the strata. The eastern elements of the DFDS drain groundwater towards the River Rhymney catchment via the Big Coal and Rhaslas Drains (Drawing MA/NL/ES/10/001). These discharge into the underground Bute Watercourse which drains southwards, running parallel with the River Rhymney for approximately 2 km and collecting water from at least three further drainage adits before itself discharging into a culverted section of the river within the town.
- 10.40. A schematic section of the site is presented as Drawing MA/NL/ES/10/002. The base of the proposed excavation of the void during coaling operations is anticipated to fall from approximately 330 metres Above Ordnance Datum (mAOD) in the northwest to about 250 mAOD in the southeast, and through the line of the section between 285 and 300 mAOD. Based on the depth of the Rhaslas coal seams, which the Coal Authority drainage plans confirm are associated with the Rhaslas drain, it is estimated that the Rhaslas Drain lies at a depth in excess of 100m within the footprint of the proposed Nant Llesg Surface Mine. The Rhaslas coal seams themselves follow the general dip of the strata and fall from an elevation of about 345 mAOD at the northwestern part of the proposed excavation to about 280 mAOD in the southeast, typically about 30 m above the floor of the proposed excavation.

Groundwater Levels

- 10.41. The locations of the piezometers within and close to Nant Llesg are shown on Figure MA/NL/ES/10/001, whilst their hydrographs are presented in Drawing MA/NL/ES/10/003. Two piezometers, numbered 5818 and 5820, have records stretching from May 2001, whereas the remainder were established in 2012.
- 10.42. Piezometers 5818 and 5820 have similar groundwater level records, fluctuating between approximately 252 and 261 m AOD, with peaks occurring in the winter months and with water levels usually within the 252 – 255 m AOD range. These levels are equivalent to depths below ground level of approximately 120 m and 100 m for piezometers 5818 and 5820 respectively. The low water levels are likely to reflect the draining influence of the DFDS. A similar influence by western elements of the DFDS is apparent at the Ffos-y-fran site to the west, where excavations have reached an elevation of 224 mAOD (some 25 m below the proposed depth of Nant Llesg) without major groundwater ingress or the need for any significant groundwater dewatering.
- 10.43. Piezometer 5818 lies centrally within the footprint of the proposed excavation of the void, and would therefore be lost during coal extraction. The base of the excavation at this location would be at an elevation of approximately 290 m AOD, and consequently the groundwater level measured in piezometer 5818 typically lies more than 30 m below the proposed base of the excavation.
- 10.44. The new Nant Llesg piezometers prefixed 'NL' (Drawing MA/NL/ES/10/001) have recorded a range of groundwater levels around the site. Water level data are now available for almost a year, since February 2012 and covering an abnormally wet summer, during which groundwater levels would be expected to be higher than normal summer levels. The measured water level variations are presented on Drawing MA/NL/ES/10/003. Piezometers NL169 and NL192 and the NL shaft, all located to the east of the proposed excavation, have generally measured water levels consistent with those recorded in piezometers 5818 and 5820, between 250 and 260 mAOD. However, the water level at NL192 appears quite variable, and occasionally rises to the water levels that have been observed at NL100 and NL170 on the northern edge of the proposed excavation, at between 270 and 280 mAOD. Water levels to the west of the excavation (at NL175 and NL186) appear higher, at between 280 and 310 mAOD.
- 10.45. It is possible that some of the apparent water level variability observed both spatially and temporally is due to the differences in borehole construction, recorded in Table 10.4. For example, the relatively high temporal water level variability observed at NL100, NL170 and NL192 could indicate a recharge influence, because all these piezometers are relatively shallow. Further monitoring of data from the new piezometers to determine the full seasonal groundwater level range at those locations, or to establish whether the water levels in the three relatively shallow piezometers are "perched", i.e. above the main water table, will be carried out.

Table 10.4 Nant Llesg Piezometer Installations

Piezometer	Depth (m)	Datum (mAOD)	Approx. Screen Section (mAOD + mbgl)	Strata
100	135	361.74	252 – 232 (110 – 130)	Sst, mdst
169*	202	393.83	204 – 192 (190 – 202)	Mdst, coal (Lwr 4ft)
170	96	337.20	274 – 244 (63.5 – 93.5)	Mdst, coal (Lwr 4ft)/old wkgs
175	183	395.22	235 – 215 (160 – 180)	Mdst, coal (Lwr 4ft)
186	175	414.77	262 – 242 (152.5 – 172.5)	Mdst, old wkgs
192	84	333.25	282 – 252 (51.5 – 81.5)	Mdst, coal (Little vein, Three Coals)
5818	166	379.65	226 – 214 (154 – 166)	Sst, mdst
5820	167	352.28	191 – 185 (161 – 167)	Sst, mdst

Notes: *piezometer 169 was completed with 50mm screen and casing, other recent piezometers at 40mm. Sst = sandstone, Mdst = mudstone

- 10.46. Groundwater level data have been collated for piezometers across Nant Llesg and the wider area for the periods September 2006 and March 2012 and contoured using the software package “Surfer” in Drawing MA/NL/ES/10/004. The contours also make use of River Rhymney levels to the east of the application site (assuming that the River Rhymney is in hydraulic continuity with the main water table) and a single set of groundwater levels measured in piezometers along the boundary of the Trecatti Landfill in the northwest of the study area in May 2011.
- 10.47. These groundwater level contours should be considered as indicative only, as within such layered and fractured strata, the identification and monitoring of all water level variability is very difficult. Ideally, nested piezometers would be installed in such strata in order to identify some of this variability. Difficult site drilling conditions prevent this, but the evidence from existing monitoring data and from Ffos-y-fran suggest that the absence of such monitoring facilities at Nant Llesg does not prevent an adequate hydrogeological understanding of the site being developed.
- 10.48. The contours for September 2006 (Drawing MA/NL/ES/10/004 Part A) have excluded a peak groundwater elevation of 390 mAOD recorded at Ffos-y-fran piezometer 5814a, which is frequently reported as artesian i.e. the monitored water level commonly reaches the surface.

This value represents a water level less than 10 m below the ground surface, and is thought to reflect perched groundwater on the clay above rockhead rather than being indicative of the elevation of the regional water table. The contours indicate that groundwater generally flows to the west or southwest at Ffos-y-fran and eastwards or southeastwards in the east, beyond the OS grid line 308000E and including Nant Llesg. This groundwater flow regime reflects the local topography and river network and to some extent, the influence of the DFDS.

- 10.49. The March 2012 contours (Drawing MA/NL/ES/10/004 Part B) are informed by more data, courtesy of the new NL piezometers. They show a high groundwater elevation of 300 mAOD in the vicinity of piezometer NL175, just to the north of Rhaslas Pond. This elevated water level strongly influences the contour pattern and may be the result of recharge from the pond. From this area, groundwater levels fall in a generally eastward or southeastward direction and at an average hydraulic gradient of approximately 4% towards the River Rhymney, where groundwater levels (based on river water level measurements) are likely to drop below 250 m AOD. There appears to be some local convergence of groundwater flow superimposed on this regional flow pattern in the vicinity of piezometers 5818 and 5820, possibly reflecting the drainage effect of the DFDS. However, this effect could be exaggerated if the nearby high water level at NL192 is a perched, rather than a main water table, elevation. For the Ffos-y-fran area the groundwater flow is again to the west or southwest.
- 10.50. Although the two sets of contours use a different subset of piezometer data, each map shows broad agreement in having predominantly southwestward groundwater flow to the west of the application site and eastward or southeastward flow within, and to the east of, Nant Llesg. This comparison of the two sets of indicative groundwater level contours suggests the presence of a groundwater divide, i.e. a localised high point, along or close to the western site boundary of the application site.
- 10.51. The two PWSs in the area are situated to the east of the River Rhymney, close to the A465 carriageway, and according to the groundwater level contours do not lie within the catchment of Nant Llesg.

Groundwater Quality

Planning application site area

- 10.52. The baseline water quality across the application site can be determined from the results of monitoring of the recently installed piezometers, undertaken by Miller Argent. Their current analytical suites for monitoring at the site are presented in Appendix MA/NL/ES/A10/001, and the main results from the groundwater monitoring at Nant Llesg between November 2011 and August 2012 are summarised in Appendix MA/NL/ES/A10/002.
- 10.53. The following observations regarding the local groundwater quality can be made from the groundwater monitoring results (with ranges given for the 5th to 95th percentile range):
- The groundwater is slightly alkaline (field pH 6.6 – 8.0);
 - It has moderate to high alkalinity (155 – 484 mg/l as CaCO₃);
 - The average total suspended solids (2387 mg/l) concentration is high compared with measurements at Ffos-y-fran, and may reflect disturbance from the piezometer installations (note this measurement is not generally significant for groundwater assessments, more so for surface water);

- Although no data are available for total dissolved solids, the electrical conductivity (EC) normally falls in the range of 360 – 966 $\mu\text{S}/\text{cm}$;
- The average dissolved oxygen (DO) measurement is 5.7 mg/l, while the average biological oxygen demand (BOD) and chemical oxygen demand (COD) values are 6.4 mg/l and 25.8 mg/l respectively;
- Of the redox sensitive chemical parameters, the 5th percentile and average values for total iron and dissolved manganese are all higher than measured at Ffos-y-fran;
- Average concentrations of the metals barium, aluminium, copper, lead and zinc are 0.34 mg/l, 5.00 mg/l, 0.05 mg/l, 0.06 mg/l and 0.18 mg/l respectively; and
- For the anions, the average alkalinity, sulphide and total phosphorus values are 288 mg/l, 0.25 mg/l and 0.69 mg/l respectively.

10.54. The range in total iron concentration in Nant Llesg groundwater is wide. This is mainly the result of high concentrations recorded in piezometer NL170, with a range of 3 – 778 mg/l measured. In the other piezometers, the highest iron concentration measured has been 91.8 mg/l, in piezometer NL192. Further data that are now being collected on a regular basis will further improve the characterisation of the groundwater quality for this and other parameters.

Comparison between Nant Llesg and Ffos-y-fran groundwater quality

10.55. A comparison between the groundwater quality at Nant Llesg and Ffos-y-fran is provided in Appendix MA/NL/ES/A10/002. Nant Llesg groundwater has lower concentrations of major ions (magnesium, sodium, potassium, chloride and sulphate), ammonia, arsenic, organic parameters and DO. However, concentrations of several metals (iron, barium, aluminium, manganese, copper, lead and zinc) are higher in Nant Llesg groundwater, whilst the average concentrations of total suspended solids in Nant Llesg groundwater are approximately seven times higher than at Ffos-y-fran, most likely as a result of disturbance at the piezometer installations.

Nant Llesg shaft

10.56. Groundwater quality data is available for a single sample taken by the Coal Authority at the NL shaft, on the eastern boundary of the application site (see Drawing MA/NL/ES/10/001), on 8 July 2009, as summarised in Appendix MA/NL/ES/A10/003. This shows that concentrations of iron and nickel are compliant with their EQS, but the concentration of zinc in this sample exceeds the EQS by approximately three times. Concentrations of the major ions sodium, calcium, magnesium, chloride and sulphate are low.

10.57. Sampling of this shaft has been incorporated into Miller Argent's routine groundwater monitoring, and additional water quality data are now available. Data from this location are included in the data summary in Appendix MA/NL/ES/A10/002. The data show variable metal concentrations, with total iron and zinc concentrations in the ranges 0.2 – 73.5 mg/l and <0.018 – 0.107 mg/l respectively. Consequently, zinc values have been within its EQS value (0.125 mg/l), but iron concentrations have exceeded its EQS value (1 mg/l) on three samples out of seven taken during the period February – August 2012.

MIS and Trecatti landfills

10.58. The MIS Waste Facility lies within the Nant Llesg scheme in the area proposed to be overlain by the overburden mound, and is an operational landfill which is permitted to receive inert

wastes. Investigations carried out in August 2012 (Chapter 17: Waste) indicated that the wastes are unlikely to have caused any groundwater contamination.

- 10.59. Trecatti Landfill, operated by Biffa Waste Services since 1992 (previously by Merthyr Tydfil County Borough Council), is situated some 500 m to the west of the application site. Landfilling dates from 1986, and prior to filling, the site was partially backfilled with colliery spoil. Communication with NRW (20 July 2012) has indicated that there are currently no water quality issues relating to groundwater data from boreholes on the southeastern or eastern perimeter of the landfill i.e. up-gradient from Nant Llesg.

Underground Drainage and Surface Water

Flow

- 10.60. There is no monitoring of flow in the River Rhymney in the vicinity of Nant Llesg. However, Coal Authority flow data for the Bute Watercourse, which is fed by discharges from the DFDS, is presented in Drawing MA/NL/ES/10/005. The data suggest that summer and early autumn flows tend to be in the order of 50 – 100 l/s (4.3 – 8.6 Ml/d), but winter 2008 and spring 2009 flows reached rates of typically 200 – 500 l/s (17 – 43 Ml/d). However, the Coal Authority has indicated that these higher flow rate measurements may be inaccurate, as a consequence of the backing up of water during periods of high flow in the River Rhymney.

Water quality

- 10.61. Samples have been taken of surface waters in the vicinity of Nant Llesg at the following locations (see also Drawing MA/NL/ES/10/001):
- The River Rhymney downstream of Rhymney Bridge (EA68635) by the NRW, some 3 km upstream of the confluence of the Bute Watercourse and the River Rhymney;
 - Upstream of the Rhymney Culvert (MA9) by Miller Argent, representing a sampling location some 1.5 km upstream of the Bute Watercourse-Rhymney confluence;
 - The Bute Watercourse immediately prior to its confluence with the River Rhymney by the Coal Authority (four samples for the so-called Pontlloftyn Drift, Bute Level) over the period August 2005 – March 2009); and
 - The River Rhymney at Pontlloftyn Bridge, by both the NRW and Miller Argent (MA10), some 0.5 km downstream of the Bute Watercourse-Rhymney confluence.
- 10.62. The monitoring results are summarised in Appendices MA/NL/ES/A10/003, 004 and 005, and a combined summary of EQS failures and elevated values is given in Table 10.5. A number of points should be noted in regard to the monitoring programme, as follows:
- Water quality samples have been taken by three parties with differing analytical suites, measurement units and minimum reporting values;
 - Analyses undertaken by NRW have used a more detailed analytical suite at the downstream monitoring point at Pontlloftyn Bridge. Six EQS parameters measured at Pontlloftyn Bridge were not measured at the upstream Rhymney Bridge monitoring point;
 - No organic determinands were analysed by the Coal Authority or NRW (with the exception of mineral oil [non-detections only]); and

- NRW and Miller Argent samples were taken over different time periods: Miller Argent has collected samples between 2004 and 2012, either monthly or quarterly, and the NRW has collected samples between 2009 and 2011 at frequencies varying between weekly and monthly.

Table 10.5 Summary of Surface Water EQS Failures and Elevated Values for the Bute Watercourse and River Rhymney.

	River Rhymney D/S Rhymney Bridge (EA68385)	Upstream of Rhymney Culvert (MA9)	Bute Watercourse (Pontlottyn Drift [Bute Level])	River Rhymney At Pontlottyn (EA18013) Pontlottyn Bridge (MA10)
EQS Failures	EA Only: -	Miller Argent Only Dissolved Iron (max) Naphthalene (ave) Anthracene (ave) Fluoranthene (ave) Benzofluoranthene (ave) Benzo(a) pyrene (ave)	Coal Authority: Ferrous Iron (ave)	NRW Only: Zinc (max) Miller Argent Only Dissolved Iron (95%ile) Naphthalene (ave) Anthracene (ave) Fluoranthene (ave) Benzofluoranthene (ave) Benzo(a) pyrene (ave)
Elevated Values	Zinc	Ammonia(N) Electrical Conductivity @ 20C Iron – Filtered Manganese – Filtered Total Polycyclic Aromatic Hydrocarbons (PAHs)	Conductivity Sulphate Ammonium (N) Manganese	Sulphate Total PAHs Manganese

Table note: Phrase in brackets after *determinand* name indicates which statistic exceeds the EQS, e.g. maximum, 95th percentile, average etc.

10.63. The multi-party sampling makes it difficult to determine water quality trends down the Rhymney catchment. However, the NRW data (Appendix MA/NL/ES/A10/004) is useful in identifying changes between the top and bottom of the catchment (Rhymney Bridge versus Pontlottyn Bridge). In particular, there are marked (double, or even order of magnitude) increases in a number of key parameters down the catchment, namely alkalinity, ammonia, EC, and dissolved iron, potassium, magnesium and manganese, whilst pH reduces from 7.89 to 7.64 (Table 10.6). The maximum zinc concentration at both Rhymney and Pontlottyn Bridges exceeds the EQS annual average.

Table 10.6 Comparison of Upstream and Downstream Water Quality, River Rhymney

Parameters	River Rhymney, Rhymney Bridge (EA68385)	River Rhymney, Pontlottyn Bridge (EA18013)
Alkalinity (mg/l)	69.38	172.9
Ammonia (mg/l)	0.06	0.11
EC @25C (μ s/cm)	356.3	701
Dissolved iron (mg/l)	0.09	0.394
Dissolved potassium (mg/l)	1.41	23.2
Dissolved magnesium (mg/l)	4.03	44.6
Dissolved manganese (mg/l)	<0.01	0.25
pH	7.89	7.64

10.64. The Miller Argent data (Appendix MA/NL/ES/A10/005) confirm that this upward trend in all the key parameters except pH is also evident over the shorter intermediate reach between upstream of the Rhymney Culvert and Pontlottyn Bridge (MA9 and MA10 respectively). Maximum iron concentrations exceed the EQS annual average for the river. The Miller Argent monitoring shows that sulphate also exhibits a marked upward trend down the catchment. Based on these average sulphate concentrations, discharge from the Bute Watercourse can be estimated to be about half of the flow in the river. Analysis of organic parameters by Miller Argent has also highlighted the presence of PAHs in the River Rhymney, both upstream and downstream of the Bute Watercourse confluence. Although normally a group of parameters with a low solubility and mobility in water, five individual PAHs exceed the EQS with their average value.

10.65. The Coal Authority data (Appendix MA/NL/ES/A10/003) is useful in characterising the main intervening discharge, namely the Bute Watercourse and the associated DFDS. With respect to the identified key parameters of alkalinity, ammonium, EC, dissolved iron, potassium, magnesium and manganese, the average concentrations of the Bute Watercourse outfall are 398 mg/l, 0.27 mg/l, 1125 μ S/cm, 0.653 mg/l, 44 mg/l, 79 mg/l, and 0.584 mg/l respectively. These are all high values relative to those observed by both NRW and Miller Argent on the River Rhymney, and the discharge from the Bute Watercourse into the River Rhymney helps to explain the change in chemistry observed between the top and bottom of the catchment of the

River Rhymney. The average ferrous iron of the discharge exceeds the EQS annual average. The pH of the discharge is also relatively acidic, at an average of 6.975, and helps explain the decline in pH in the main river between Rhymney and Pontlloftyn Bridges. Given the chemistry of the discharge, it is unsurprising that the EA consider the DFDS discharge as the second worst unmitigated discharge in Wales.

- 10.66. EC and zinc measurements can be used to illustrate the change in water quality upstream and downstream of the Bute Watercourse discharge. The time series plot for EC at the Rhymney and Pontlloftyn Bridges (Drawing MA/NL/ES/10/006) shows that the downstream monitoring point has EC values up to three times higher than at the upstream location. As discussed above, this difference is largely attributable to the intervening Bute Watercourse discharge. The difference is particularly pronounced in summer months, when flows are usually lower. Conversely, in winter and spring months, EC values for these monitoring points tend to be similar, suggesting the importance of dilution on surface water chemistry during these wetter months. The total zinc time series (Drawing MA/NL/ES/10/007) shows broadly similar concentrations in the River Rhymney in upstream and downstream samples, with values usually less than 20 µg/l, with occasional peaks of up to 150 µg/l. Peaks in zinc tend to occur commonly in summer months, but January to February 2010 is the exception to this. Both the periods of similar EC between the upstream and downstream monitoring points and the peaks in total zinc correlate well with peaks in suspended solids (Drawing MA/NL/ES/10/008), suggesting that they are related to runoff events.

Planning Context

Legislation

- 10.67. In formulating development proposals, consideration must be given to the WFD. This came into force in December 2000 and established a comprehensive legal framework for the protection, improvement and sustainable use of all water bodies across Europe. The remit of the WFD extends to groundwater, as well as all inland surface waters, and also coastal waters.
- 10.68. In order to prevent pollution, the WFD requires Member States to introduce measures that prevent the entry of hazardous substances and limit the input of non-hazardous substances to groundwater. The WFD also prohibits the direct discharge of all pollutants, with certain limited exceptions. Article 6 of the Groundwater 'Daughter' Directive (GWDD, Directive 2006/118/EC) provides details of how the "prevent" and "limit" provisions of the WFD should be implemented.
- 10.69. The earlier Groundwater Directive (GWD, Directive 80/68/EC) also requires Member States to prevent or limit the entry of certain substances into groundwater. The GWD's annex contains two lists. The direct or indirect discharge to groundwater of substances under List I must be prevented (except under very limited and well defined circumstances), and the discharge of List II substances into groundwater must not cause pollution. The GWD is now implemented in the UK by way of the Environmental Permitting (England and Wales) Regulations (EPR) 2010, in which List I substances are now referred to as "hazardous substances", whilst a broader form of List II maps onto "non-hazardous pollutants". The GWD will be revoked in 2013, to allow the WFD to become the lead directive in terms of the protection of water resources.
- 10.70. The WFD, GWDD and GWD were transposed into English and Welsh law through the Water Environment (WFD) (England and Wales) Regulations 2003, the River Basin Districts Surface Water and Groundwater Classification (WFD) (England and Wales) Direction 2010 and The River Basins Typology, Standards and Groundwater threshold values (WFD) (England and Wales) Directions 2009. The core objective of these initiatives is to protect and improve the water environment. This includes preventing deterioration in the status of waterbodies and, where possible, restoring surface waters and groundwater damaged by pollution, water

abstraction, dams and engineering activities to “Good” status’ by 2015. However, the regulations recognise that, in some cases, achievement of “Good” status by 2015 would be technically infeasible or disproportionately costly, so later deadlines can be justified, where appropriate.

- 10.71. In order to meet these objectives, the WFD and subsequent regulations introduced a new process known as “River Basin Management Planning” to protect, monitor and improve the water environment in a sustainable way, and provided for regulations (the EPR, discussed below) to control the activities likely to have adverse effects on the water environment. The regulations name NRW as the competent authority for managing both the planning and regulatory frameworks.
- 10.72. A central principle of the WFD is that comprehensive RBMPs are prepared for each Member State to set out how the water environment within each River Basin District (RBD) will be managed over a succession of planning cycles. The first RBMPs cover the period from 2009 to 2015, and subsequent plans will be published every six years thereafter.
- 10.73. Nant Llesg and the surrounding areas are located in the Severn RBD. The EA produced a RBMP for the Severn RBD in December 2009. The RBMP contains an assessment of the current condition of all water bodies within the district, sets out the environmental objectives for the current river basin planning cycle and beyond, and specifies the programme of measures required to meet these objectives. The RBMP is supplemented by a number of Area Management Plans, which provide further local detail. The application site is situated in the area covered by the South East Valleys Area Management Plan catchment.
- 10.74. The EPR provide the framework for the consenting of all activities that have the potential to impact the water environment, including the following:
- Discharges to all wetlands, surface waters and groundwaters (replacing the Control of Pollution Act 1974);
 - Disposal to land (replacing the Groundwater Regulations 1998);
 - Abstractions from all wetlands, surface waters and groundwaters;
 - Impoundments (dams and weirs) of rivers, lakes, wetlands and transitional waters; and
 - Engineering works in inland waters and wetlands.
- 10.75. It is anticipated that the existing exemption from water abstraction licensing regulations for the dewatering of mines and quarries will be removed. The timing of this remains uncertain, but is unlikely that regulations to achieve this will be brought into force before October 2013. The ability to make regulations arises under the Water Act 2003, and mine and quarry operators abstracting more than 20 m³/d of groundwater for dewatering purposes will be required to apply to the NRW for a transfer licence. If the abstracted water is put to any intervening use, for example dust suppression or operating plant use, the operator will be required to hold a full abstraction licence for that proportion of the abstraction.

Planning policy

- 10.76. The Welsh Government's Minerals Technical Advice Note 2: Coal (MTAN 2) (Wales) sets out guidance on the delivery of policy for coal extraction through surface and underground working by mineral planning authorities (MPAs) and the coal mining industry. It is a companion document to Minerals Planning Policy Wales (MPPW), which sets out the general policies for all mineral development.

- 10.77. MTAN 2 states that the MPA, taking advice from NRW, needs to be satisfied that the consequences of any adverse impact of extraction on the water environment is acceptable or can be made so by mitigation measures.
- 10.78. MTAN 2 identifies potential effects on surface water and/or groundwater from coal working and notes that dewatering for mineral extraction and engineering works has been exempt from abstraction licensing, but the regulations to be made under the Water Act 2003 will, once in place, lift that exemption. MTAN2 also identifies a number of effects that can potentially be caused by the drawdown in local groundwater levels. Baseline studies are required to provide sufficient information such that the site and surrounding areas are suitably characterised and to allow the construction of a robust conceptual hydrogeological model.

Data Limitations

- 10.79. Groundwater quality data specific to the Nant Llesg site are limited, but recently installed piezometers and access to the NL shaft on the eastern boundary of the site are now providing relevant baseline data. Extensive monitoring data for the Ffos-y-fran site to the west also provide valuable local groundwater information.
- 10.80. There is no NRW monitoring of flows in the River Rhymney in the vicinity of the application site. In addition, the Coal Authority has also only been able to carry out a limited amount of flow monitoring within the Bute Watercourse prior to its discharge to the culverted section of the River Rhymney. Monitoring of the Bute Watercourse flows has been limited by health and safety (mine gas) issues and by extremely variable flow conditions in the drainage channel and the River Rhymney. The Coal Authority considers that the high flows that have been measured are likely to be inaccurate, over-recording as a result of backing up of water levels in the river.
- 10.81. Similarly, only four water samples have been taken by the Coal Authority of the Bute Watercourse since August 2005 and hence information on the variability of the discharge quality is also limited. The samples provide cumulative data for the contributing catchment but do not allow identification of any specific source area for the contaminants concerned. Other data collected by the NRW and Miller Argent provide water quality information for the River Rhymney “upstream” and “downstream” of the Bute Watercourse discharge.
- 10.82. In conclusion, Rhymney flow and DFDS discharge flow rates and quality represent the main information gaps with respect to the hydrogeology at Nant Llesg.

Changes in Baseline Environment

Seasonal temporal change

- 10.83. Groundwater level and quality conditions will vary, principally due to changing climatic (recharge) conditions. Seasonally, groundwater levels can be expected to be higher in the winter and lower in the summer, on the basis that recharge to the Coal Measures strata will generally be greater during the winter period.
- 10.84. Bute Watercourse discharge rates and River Rhymney flows can also be expected to respond to climatic conditions, with these generally being greater during the winter period. River water quality can also be expected to vary in accordance with such flow variations.

Long-term climate change

10.85. The two main influences on the long-term temporal variability of the hydrology and hydrogeology of the study area can be considered to be land use and climate change. These have the potential to change the ground infiltration and runoff characteristics (through changes in land use) and river flow regime (through changes in rainfall patterns as a result of climate change). Climate may prove more variable, with observed historical and predicted future changes in global climate due to a combination of both natural and human causes. The main human influence on global climate is increasing emissions of greenhouse gases such as carbon dioxide and methane. For this region of Wales, the latest climate change predictions indicate decreases in summer rainfall of between 10% and 20% by the 2050s (UKCP, 2009). This is predicted to be accompanied by increases in winter rainfall of between 10% and 20%. As a result, river flows may be expected to increase in the winter, with more frequent storm events occurring throughout the year.

Assessment Criteria and Assignment of Significance

Receptor Sensitivity or Value

10.86. The assessment methodology employed to evaluate the significance of potential effects of the proposed development on groundwater takes into account the sensitivity (or importance) of the potential groundwater receptors and the magnitude of change that these receptors will be anticipated to experience. Table 10.7 provides a summary of the sensitivity (or value) of the various types of groundwater receptors, including the groundwater body, together with the range of features that are linked to it and which may be subject to potential effects.

Table 10.7 Summary of Sensitivity (or Value) of Groundwater Receptors

Sensitivity/ Value	Criteria	Examples
Very High	Receptor with a high quality and rarity at a regional or national scale, with a limited potential for substitution.	High-quality principal aquifer, baseflow-fed river used for public water supply, or groundwater-fed Ramsar site.
High	Receptor with a high quality at a sub-regional scale, with a limited potential for substitution.	High-quality secondary aquifer used for public water supply or groundwater-fed SAC and/or Special Protection Area.
Medium	Receptor with a medium/poor quality at a sub-regional scale, with a limited potential for substitution.	High-quality secondary aquifer, baseflow-fed river used for PWS or groundwater fed SSSI.
Low	Receptor with a variable quality at a local scale, with potential for substitution	Low quality secondary aquifer, non-aquifer or baseflow-fed river, local wells, springs and sinks, or groundwater-fed non-statutory wetlands.

Magnitude of Change

10.87. The magnitude of change on groundwater receptors is mainly determined by a semi-quantitative evaluation, although it also takes into account professional judgement and is independent of the sensitivity of the feature. Table 10.8 provides examples of how various levels of change (graded from “*high*” through “*medium*” and “*low*” to “*negligible*”) have been determined with respect to groundwater receptors.

10.88. With respect to the groundwater resource, the magnitude of any loss of groundwater is based largely on estimates of likely dewatering requirements when excavations in the proposed surface mine have extended to below the main water table.

10.89. In terms of groundwater quality, the magnitude of change can be related to the water quality criteria relevant to each receptor. With respect to river baseflows, the EQSs for these receptors can be applied. For groundwater bodies as a whole, the following GWD and EPR requirements relating to pollution by metals are relevant:

- Hazardous substances (cadmium and mercury) must be prevented from entering groundwater; and
- Non-hazardous pollutants must be limited from entering groundwater to avoid pollution. These substances include iron, manganese, aluminium, arsenic, lead, zinc and copper.

Table 10.8 Examples of Hydrogeological Magnitude of Change

Magnitude	Criteria	Examples
High	Results in major change to a feature, i.e. of sufficient magnitude to affect its use/ integrity.	Major decline in groundwater levels, baseflow or quality, severely limiting use and lowering water body or wetland status.
Medium	Results in noticeable change to feature, i.e. of sufficient magnitude to affect its use/ integrity in some circumstances.	Moderate decline in groundwater levels, baseflow or quality, limiting use and lowering water body or wetland status in some circumstances.
Low	Results in minor change to feature, with insufficient magnitude to affect its use/ integrity in most circumstances.	Small decline in groundwater levels, baseflow or quality, with limited consequences in terms of use and water body or wetland status.
Negligible	Results in little or no change to feature, with insufficient magnitude to affect its use/ integrity.	Little or no decline in groundwater levels, baseflow or quality, and no consequence in terms of use and water body or wetland status.

10.90. Impact magnitude also takes into account the impact duration, for which the following definitions are relevant in relation to groundwater issues:

- **Permanent:** beyond the lifetime of the project or longer;
- **Temporary – Short Term:** a period of months, up to one year;

- **Temporary – Medium Term:** a period of more than one year, up to five years; and
- **Temporary – Long Term:** a period of greater than five years.

Determination of Significance

10.91. The significance of potential effects is derived by considering both the sensitivity of the feature and the magnitude of change, as summarised in Table 10.9. This approach, to determine whether the effects are “*significant*” or “*not significant*” in environmental impact assessment terms, is in line with the Environmental Impact Assessment Regulations.

Table 10.9 Significance Assessment Matrix

Sensitivity of Receptor	Magnitude of Change			
	High	Medium	Low	Negligible
Very High	Major	Major	Moderate	Minor
High	Major	Moderate	Moderate	Minor
Medium	Moderate	Moderate	Minor	Not significant
Low	Minor	Minor	Not significant	Not significant

10.92. Hydrogeological examples of the broad definitions of the terms used are as follows (note that effects can be adverse or beneficial):

- Adverse *major or moderate* effects may include derogation of principal aquifers or public water supplies in terms of quantity or quality, pollution of high quality groundwater-fed watercourses, and irreversible damage or long term damage to groundwater-supported important ecological sites. Beneficial effects might include, for example, improvement of nationally recognised pollution discharges; and
- Adverse *minor or not significant* effects may include derogation of poor quality secondary aquifers and PWS in terms of quantity or quality, pollution of already poor quality groundwater-fed watercourses, and damage to groundwater-fed, non-statutory wetlands. Beneficial effects may, for example, include improvement in local water quality.

Mitigation Measures Adopted as Part of the Project

Mitigation during Site Operations

- 10.93. Groundwater management during the main site operations would seek to minimise the effects on the surface and groundwater regime within the vicinity of the site. Where possible, this means targeting any dewatering and attempting to keep surface and groundwater sources of water within the void separate as far as is practicable. This would minimise the volume of water to be pumped to the surface for treatment prior to discharge. In addition, where highly permeable deposits within superficial deposits (e.g. sand and gravel lenses) are intercepted in the upper sidewalls of the excavations, then these could be sealed with engineered low hydraulic conductivity materials to prevent inflows.
- 10.94. Site operations would involve the use of heavy plant and machinery, and this would result in the need to store oils and diesel with the consequential risks of accidental spillages. The site would therefore adopt best working practices and measures to protect the water environment, including the bunding of fuel storage tanks, control of runoff from metallised surfaces and measures to deal with any fuel spillages.
- 10.95. As mentioned in the 3 July 2012 meeting with the NRW, investigations are ongoing in order to characterise the on-site MIS Landfill wastes and their pollution potential. Subject to these, appropriate works would be undertaken to engineer and prepare the site to a condition appropriate to be covered by the overburden mound.
- 10.96. It is not anticipated that large volumes of groundwater would be encountered during the early stages of excavation at Nant Llesg, since monitoring data suggest that groundwater levels are at depth within the Coal Measures strata. Shallow perched aquifers in superficial deposits and within the bedrock would drain into the excavation, and the water would be allowed to drain from the base of the excavation or be pumped out to water treatment areas (WTAs) and managed as part of the surface water management scheme.
- 10.97. It is anticipated that the Rhaslas Drain would be intercepted near to the base and southern edge of the excavation, at an elevation of approximately 260 mAOD. The contribution that this drain makes to the total flow that has been measured at the outfall of the Bute Watercourse into the River Rhymney, and the catchment it serves, are unknown. However potentially large flow rates can be expected during wet periods. Flow rates measured in the Bute Watercourse have varied in the range 50 – 500 l/s (4.3 – 43MI/d). If the Rhaslas Drain contributes 50% of the total, then DFDS inflow rates to the excavation in the order of 25 – 250 l/s (2.1 – 21 MI/d) can be anticipated, but for impact assessment purposes reference is made to the higher Bute Watercourse flows.
- 10.98. Subject to the quality and quantity of this water, it may be allowed to drain to the base of the excavation, where it can be managed together with surface water run-off that is collected within the void. Alternatively, the water would be collected and pumped from the excavation. This is considered the most likely scenario, and so has been assumed for the purposes of the impact assessment. This scenario requires that water would be pumped initially to WTA 2, from where it would be discharged (following any required flow balancing and treatment) under consent into the River Rhymney via the Nant Llesg watercourse (Refer to Chapter 11: Hydrology). Appropriate treatment facilities (e.g. the use of aeration, settlement and chemical dosing) would be constructed to promote the precipitation and removal of metals (notably iron) prior to discharge, in accordance with limits to be agreed with NRW, and would assist in improving water quality in the receiving river, as well as compensating for flow losses.

Mitigation during Site Restoration

- 10.99. The disruption of the Rhaslas Drain introduced during the site operations would be rectified on restoration by the installation of a replacement adit or some similar construction. This feature would reconnect the upstream and downstream undisturbed elements of the Rhaslas Drain and so would restore DFDS discharges into the Bute Watercourse.
- 10.100. With respect to water quality, the development proposals for Nant Llesg involve the excavation of the overlying rock strata to expose the coal seams. Initially, when excavating the box cut, the overburden would be stored above ground, but subsequently it would be progressively backfilled into the decoaled areas. The stored overburden would then be replaced within the final void following the cessation of coaling operations, as part of the final restoration phase.
- 10.101. The excavation works would remove some of the source of the current groundwater contamination. However, the disturbed overburden would still have the potential to oxidise and leach metals as it becomes saturated, and this could lead to adverse effects on water quality if the appropriate mitigation measures are not put in place. The proposed limited duration of its exposure, especially in terms of progressively restored overburden, means that the effects would be more limited than those from overburden that has been kept in above ground storage for a protracted period. However, it is still important to identify the level of risk to groundwater and implement an appropriate strategy during site operations. A backfill strategy would be required for the site, and would be designed to optimise the use of carbonate buffering rock present at the site to minimise the generation of leachate from the backfilled material. This strategy could also include the following elements:
- Use of low hydraulic conductivity surface capping material to minimise surface water recharge into the backfill and reduce the potential for leachate generation;
 - Placement of higher sulphide material in the deepest, sub-water table part of the void to minimise pyrite oxidation; and
 - Execution of a Water Management Plan across the site. This would include details for groundwater and surface water monitoring.
- 10.102. It is proposed that an appropriate backfill strategy is developed and implemented by means of a planning condition and consultation with NRW. An initial Backfill Risk Assessment (BFRA) has been carried out (Appendix MA/NL/ES/A10/006), based on a methodology for evaluating the pollution potential of opencast backfill prepared for the Scottish Environment Protection Agency (SEPA) (Younger and Sapsford, 2004). There is no current similar guidance for England and Wales. The assessment indicates that site-specific mineralogical analysis is needed to inform the development of a detailed backfill strategy for the site, and this would be based on samples acquired during the proposed excavation of the void.

Summary of Proposed Mitigation

- 10.103. Table 10.10 summarises the environmental measures that have been incorporated into the development proposals in order to avoid, reduce or compensate for potential adverse effects and their likely effectiveness, i.e. whether the effects be fully, substantially or only partially effective.

Table 10.10 Summary of Proposed Mitigation Measures

Receptor/ Issue	Change(s) and Potential Negative Effects	Incorporated Mitigation	Likely Effectiveness
Groundwater Body (GW1)			
Resource during site operations	Dewatering at the site at depth, i.e. below the Rhaslas Drain, would reduce water levels in the groundwater body.	Since the site area is already drained at depth by the DFDS, additional drawdown would be limited. Regular water level monitoring would be undertaken, and the pumping strategy altered if deemed necessary.	Reduction – Substantially Effective
Quality during site operations	Site works could disturb the MIS Facility and mobilise contaminants into the groundwater body.	Waste removal from the northern area and capping of the remaining wastes before overtipping would minimise any contaminant mobilisation from the MIS site.	Avoidance – Fully Effective
Quality during site operations	Dewatering could change groundwater flow directions and draw in potentially contaminated groundwater from Trecatti Landfill.	Additional drawdown would be limited and leachate management and groundwater monitoring at Trecatti is well established. The pumping strategy would be altered if deemed necessary.	Reduction – Substantially Effective
Quality during site operations	Site operations could potentially introduce contaminants to the groundwater body.	Adoption of best practice during site operations would address this risk.	Reduction – Substantially Effective
Quality following site restoration	Groundwater rebound through the backfill may release metal- and sulphate-rich waters to the groundwater body which in turn could further pollute the groundwater body.	A backfilling strategy would be agreed with NRW to minimise any potential to generate contaminated water.	Reduction – Substantially Effective
DFDS (Rhaslas Drain, GW2)			

Receptor/ Issue	Change(s) and Potential Negative Effects	Incorporated Mitigation	Likely Effectiveness
Flow during site operations	The drain would be partially removed by site excavations, disrupting DFDS flow.	Groundwater would be either allowed to discharge into the operational void or collected separately from surface water if possible and pumped for treatment as necessary prior to discharge.	N/A
Quality during site operations	Site works could disturb the MIS Facility and mobilise contaminants into the groundwater body.	Waste removal from the northern area and capping of the remaining wastes before overtipping would minimise any contaminant mobilisation from the MIS site.	Avoidance – Fully Effective
Quality during site operations	Dewatering could change groundwater flow directions and draw in potentially contaminated groundwater from Trecatti Landfill.	Additional drawdown would be limited and leachate management and groundwater monitoring at Trecatti is well established. The pumping strategy would be altered if deemed necessary.	Reduction – Substantially Effective
Quality during site operations	Site operations could potentially introduce contaminants to the groundwater body, which in turn could further pollute the DFDS.	Adoption of best practice during site operations would address this risk.	Reduction – Substantially Effective
Flow following site restoration	Following the restoration of the site, flow from the drain would discharge into the backfill materials.	The drainage route to the Bute Watercourse would be reinstated in some form. Development of a backfill strategy to be agreed with NRW.	Avoidance – Substantially Effective
Quality following site restoration	Groundwater rebound through the backfill may release metal- and sulphate-rich waters to the groundwater body, which in turn could further pollute the DFDS.	A backfilling strategy would be agreed with NRW to minimise any potential to generate contaminated water.	Reduction – Substantially Effective

Receptor/ Issue	Change(s) and Potential Negative Effects	Incorporated Mitigation	Likely Effectiveness
R Rhymney Baseflow (R1)			
Baseflow volumes during site operations	Dewatering at the site and interception of the Rhaslas element of the DFDS would reduce baseflow to the river.	Treated groundwater would be used to augment river flows.	Compensation – Fully Effective
Baseflow quality during site operations	Site works could disturb the MIS Facility and mobilise contaminants into the baseflow.	Waste removal from the northern area and capping of the remaining wastes before over-tipping would minimise any contaminant mobilisation from the MIS.	Avoidance – Fully Effective
Baseflow quality during site operations	Dewatering could change groundwater flow directions and draw in potentially contaminated groundwater from the Trecatti Landfill.	Additional drawdown would be limited, and leachate management and groundwater monitoring at Trecatti is well established. The pumping strategy would be altered if deemed necessary.	Reduction – Substantially Effective
Baseflow quality during site operations	Site operations could potentially introduce contaminants to the groundwater body, which in turn could further pollute the river baseflow.	Adoption of best practice during site operations would address this risk, and treatment would provide overall betterment of river baseflow.	Reduction – Substantially Effective
Baseflow volumes following site restoration	Following the restoration of the site, flow from the drain would discharge into the backfill materials.	The drainage route to the Bute Watercourse would be reinstated.	Avoidance – Substantially Effective
Baseflow quality following site restoration	Groundwater rebound through the backfill may release metal- and sulphate-rich waters to the groundwater body, which in turn could further pollute the river baseflow.	Source of some of the contamination would be removed during excavation. A backfilling strategy would be agreed with NRW to address the potential to generate contaminated water.	Reduction – Substantially Effective
Llechryd PWS (PWS1)			

Receptor/ Issue	Change(s) and Potential Negative Effects	Incorporated Mitigation	Likely Effectiveness
Resource	Dewatering at the site at depth, i.e. below the Rhaslas Drain, would reduce water levels in the groundwater body, and affect PWS water levels and yield.	Since the site area is already drained at depth by the DFDS, additional drawdown would be limited, especially at the distance of the PWS. Regular water level monitoring would be undertaken. The pumping strategy would be altered if deemed necessary..	Reduction – Fully Effective
Princetown PWS (PWS2)			
Resource	Dewatering at the site at depth, i.e. below the Rhaslas Drain, would reduce water levels in the groundwater body, and affect PWS water levels and yield.	Since the site area is already drained at depth by the DFDS, additional drawdown would be limited, especially at the distance of the PWS. Regular water level monitoring would be undertaken. The pumping strategy would be altered if deemed necessary.	Reduction – Fully Effective

Environmental Assessment

Assessment of Effects – Groundwater Body and DFDS (Rhaslas Drain)

Baseline conditions

10.104. Baseline conditions at Nant Llesg in terms of groundwater levels and quality have been presented earlier (paragraphs 10.41 – 10.66). Groundwater level monitoring data indicate a general eastward groundwater flow towards the River Rhymney, with eastern sections of the DFDS influencing these levels. Groundwater drains via the Rhaslas Drain to the Bute Watercourse, which in turn discharges into the culverted reach of the River Rhymney, just upstream of Pontlloftyn Bridge. The Bute Watercourse drainage has been shown to have an adverse impact on the quality of the River Rhymney, increasing the levels of alkalinity, ammonium, EC, dissolved iron, potassium, magnesium, manganese and sulphate immediately downstream.

Predicted baseline trends

10.105. In the event that the proposed development does not go ahead, then local groundwater levels can be expected to be unaffected and continue to show seasonal variations and the adverse influence of the DFDS on water quality in the River Rhymney. The drainage system beneath the site would continue to discharge groundwater at variable flow rates and with elevated metals and sulphate concentrations into the River Rhymney.

Predicted effects during mineral production

- 10.106. Available data suggest that the regional water table at Nant Llesg is at great depth below the ground surface, with elevations in the range 255–300 m AOD. However, since the deepest, southern part of the excavation is planned to reach an elevation of 248 m AOD, in order to work the site safely and in dry conditions, it can be anticipated that some dewatering to remove groundwater would be required. Though limited in extent and duration, such dewatering would lower groundwater levels in the area and reduce flows in the associated DFDS.
- 10.107. The volume of dewatering required for an excavation below the water table is dependent on the excavation depth, water level, hydraulic gradient, hydraulic conductivity of the water-bearing horizons, and the degree of connectivity within the formation and any historic mine workings or drainage features.
- 10.108. A methodology and suite of tools for Hydrogeological Impact Assessment of dewatering abstractions that takes some account of these factors has been developed by the EA (2007), and some of the Tier 1 (Basic) tools have been used in assessing the likely dewatering volumes and theoretical zone of influence at Nant Llesg. It should be noted that these tools apply to assessments for relatively homogeneous hydrogeological conditions and cannot accurately take into account more complex situations incorporating for example major fracturing, faulting etc. In extreme circumstances, existing drainage routes may have become blocked over time, and their disturbance during mining has the potential to remove the blockage and release unpredictably large volumes of water.
- 10.109. To help accommodate these uncertainties, ranges of values of input parameters have been used with the EA tools to provide an indication of the worst case and most likely conditions, as follows:
- A typical hydraulic conductivity for the Coal Measures succession at Nant Llesg would be in the order of 10^{-7} m/s (0.01 m/d) (Edwards, 2004), but past mining activities could increase this value to 10^{-6} or 10^{-5} m/sec (0.1 – 1 m/d). Hydraulic conductivity values of a half an order of magnitude higher (5×10^{-5} m/s, 4 m/d) have also been included in the calculations even though borehole logs from the extensive site investigations carried out at the Nant Llesg site indicate the dominance of lower hydraulic conductivity mudstones (Drawing MA/NL/PA/041 in the Geology section of Chapter 3);
 - The maximum proposed excavation area is approximately 900 m by 900 m. Due to the progressive nature of the proposed working and restoration, the open area at any one time would be no more than 900 m by 600 m, and in view of the proposed base levels in relation to groundwater levels, just the southern half of the site is considered likely to require dewatering i.e. a maximum area of approximately 900 m by 450 m. This equates to an effective circular radius (converting a rectangular pit to a circular equivalent) of approximately 360 m;
 - Piezometric levels in the Nant Llesg area have been measured typically in the range 255 – 300 mAOD. With a maximum depth of excavation at 248 mAOD, a drawdown in the range of 7 – 52 m is likely to be required, although, based on the distribution of water level measurements, the higher value in the range is considered to be most unlikely.
- 10.110. These ranges of hydraulic conductivity and potential drawdown values have been used to estimate the effective radius of influence of dewatering and the lateral groundwater inflow to the excavation as a result of the dewatering. The results are presented in Table 10.11, with the exception of those using hydraulic conductivity values of 10^{-7} m/s because of the very limited

and therefore impractical radius of influence that results from assuming such a low hydraulic conductivity.

Table 10.11 Estimated Radius of Influence and Inflow from Dewatering

Scenario	Hydraulic Conductivity (m/s)	Required Drawdown (m)	Estimated Radius of Influence (m)	Inflow (l/s) (MI/d)
1	5×10^{-5}	52 (max, unlikely)	6190	1910 (165)
2	10^{-5}	52 (max, unlikely)	3245	520 (45.2)
3	10^{-6}	52 (max, unlikely)	1410	94 (8)
4	5×10^{-5}	30 (med, possible)	4861	1179 (102)
5	10^{-5}	30 (med, possible)	2590	330 (286)
6	10^{-6}	30 (med, possible)	1170	62 (5.4)
7	5×10^{-5}	7 (min, likely)	2699	359 (31)
8	10^{-5}	7 (min, likely)	1516	110 (9.4)
9	10^{-6}	7 (min, likely)	770	23 (2.0)

Note: All of the above calculations assume an annual recharge of 0.5 m, a conservative value given the catchment characteristics and estimated surface runoff and transmission through the soil zone as presented in the hydrology chapter.

10.111. The high (52 m) drawdown estimates of inflow and extent of radius of influence are likely to be overestimates because the high water level of piezometer NL175 used to derive the 52 m drawdown requirement is unrepresentative of the site, influenced as it probably is by its proximity to the nearby Rhaslas Pond.

10.112. Based on the remaining calculations, it is suggested that the **theoretical** radius of influence and inflow would be in the order of 1000 – 3000 m and 5 – 31 MI/d. The range of flows measured in the Bute Watercourse (50 - 500 l/s, 4.3 – 43 MI/d) can be considered to provide an indication of the discharge from the local groundwater catchment, and the calculated inflow rates are broadly consistent with this range.

10.113. These theoretical estimates have been used to inform the receptor search radius quoted in paragraph 10.22, and also the hydrogeological impact assessment presented in the remainder of this chapter. However, it is important to note that the bulk of the dewatering volumes would be associated with the DFDS, and more specifically the Rhaslas Drain, rather than the in-situ groundwater beneath the level of the DFDS, and so the actual radius of influence associated

with the dewatering would be much less than calculated. This is especially the case given that the dewatering of these deeper parts of the mine would be for a limited period only (months).

- 10.114. For the purposes of the assessment, it has therefore been assumed that the dewatering would lower groundwater levels by 7 – 30 m over a radius of up to 3 km, and would capture the majority of the water that would otherwise reach the Bute Watercourse by way of the DFDS, and in particular the Rhaslas Drain. Subject to volumes and the contribution from incident rainfall, the groundwater and DFDS drainage water entering the Nant Llesg Surface Mine void would be collected and pumped to the surface, as necessary, and on to WTA 2, where it would be controlled and treated prior to discharge to the Nant Llesg tributary of the River Rhymney. The intercepting of the DFDS water in this way would mean that the downstream DFDS would experience a marked fall in flow during site operations.
- 10.115. Mitigation such as the adoption of best working practices and measures to protect the water environment and capping of the MIS Facility before overtipping, would ensure that the quality of the groundwater and DFDS waters are little affected.

Predicted effects during and following restoration

- 10.116. Groundwater levels would be allowed to recover during the backfilling and restoration of the site, where this does not interfere with ongoing site operations. It is anticipated that these levels would revert to near those that have been measured prior to any works being carried out at the site. Similarly, with some form of replacement of the Rhaslas Drain, flows in the DFDS would be restored to baseline levels.
- 10.117. With respect to post-restoration groundwater quality, it is proposed that a more detailed (Level 3) BFRA is undertaken, taking into account the mineralogy of the local strata, to establish whether there are any preferences with regard to the placement of, for example carbonate minerals to provide buffering (acid neutralising) capacity and higher sulphide material during the infilling.
- 10.118. The decoaling would remove a proportion (~20%) of the coal seams and old workings which are contributing to the elevated metals and sulphate concentrations which are affecting the quality of the River Rhymney, and with appropriate backfilling, the quality of the groundwater body and within the DFDS can be expected to improve over the baseline in the longer term.

Significance of effects

- 10.119. During site operations, dewatering would result in the lowering of groundwater levels in the vicinity of the excavations. The local groundwater body (GW1) is considered to be of “*low*” sensitivity, based on its secondary status, limited use, and variable and sometimes poor quality. The likely magnitude of change is considered to be “*medium*” and “*temporary – short term*”, since active dewatering is principally only likely to be required when the excavations are at considerable depth, and even then would be largely intercepting DFDS water. Consequently, dewatering and the associated effect on the local groundwater resource are considered to be “*minor*” in environmental impact assessment terms.
- 10.120. Interception and removal of part of the Rhaslas Drain (GW2) during the excavations would result in a “*high*” magnitude and “*temporary – long term*” loss of flow in the down-gradient Rhaslas Drain east of the application site. The DFDS is considered of “*low*” sensitivity on account of its poor quality and the absence of any water users. Therefore any loss of flow is considered to be “*minor*”. The impact on the flows in the River Rhymney is discussed later in paragraph 10.136.
- 10.121. During site operations, and with the appropriate mitigation in place, it is not anticipated that groundwater quality within the Coal Measures strata or the DFDS would change. With its “*low*”

- sensitivity and likely “low” magnitude, “temporary – short term” change, the effect on local groundwater and DFDS quality is considered to be “not significant”.
- 10.122. Following backfilling and restoration, groundwater levels would recover to approximate pre-excavation levels. The change with respect to the groundwater resource (GW1) would be of “low” magnitude and “temporary – short-term”, in conjunction with a “low” sensitivity, and therefore “not significant”.
- 10.123. The cessation of dewatering, together with reinstatement of the Rhaslas Drain, would also allow flows to be re-established in the DFDS. The change with respect to baseline DFDS flows would be of “low” magnitude and “temporary – short-term”, in conjunction with a “low” sensitivity, and therefore “not significant”.
- 10.124. An appropriate backfill strategy would be developed and agreed with NRW such that any adverse effects on the groundwater body (GW1) quality and on the quality of the DFDS and the Rhaslas Drain (GW2) would be avoided. The change with respect to both groundwater quality and DFDS quality is considered likely to be of “low” magnitude within a “low” sensitivity, hence the effect on these receptors would be “not significant”. However the change would be positive and “permanent” as a consequence of the removal of the coal seams and old workings from the excavations.

Assessment of Effects – Other Groundwater Receptors

Introduction

- 10.125. Apart from groundwater and the Rhaslas Drain, there are only three other groundwater receptors in the theoretical radius of influence of the site dewatering, namely the baseflow component to the River Rhymney and the two PWSs to the northeast. The impact assessment for these features is presented below.

Baseline conditions

- 10.126. Baseline conditions at Nant Llesg in terms of River Rhymney flow and quality have been presented earlier (paragraphs 10.61 – 10.65). Groundwater level monitoring data indicate a general eastward groundwater flow towards the River Rhymney, with eastern sections of the DFDS influencing these levels. Groundwater drains via the Rhaslas Drain to the Bute Watercourse, which in turn discharges into the culverted reach of the River Rhymney, just upstream of Pontlloftyn Bridge. The Bute Watercourse drainage has been shown to have an adverse impact on the quality of the River Rhymney, increasing the levels of alkalinity, ammonia, EC, dissolved iron, potassium, magnesium, manganese and sulphate immediately downstream, but exceedance of EQSs appear to have only been observed by NRW with respect to zinc. Nevertheless, the DFDS discharge is currently considered the second worst unmitigated discharge in Wales by the EA.
- 10.127. The two PWS are located to the north east of the application site, to the east of the River Rhymney, and according to the baseline groundwater level contours do not lie in the current catchment of Nant Llesg.

Predicted baseline trends

- 10.128. In the event that the proposed development does not go ahead, then local groundwater levels can be expected to be unaffected and continue to show seasonal variations and the influence of the DFDS. The drainage system beneath the site would continue to discharge groundwater at variable flow rates and with elevated metals and sulphate concentrations into the River

Rhymney. The flows and quality of the River Rhymney and the PWSs would remain at baseline levels.

Predicted effects during mineral production

- 10.129. Although there is no flow data for the River Rhymney in this area, groundwater at Nant Llesg provides baseflow to the river, including the discharge from the Bute Watercourse. Consequently, the interference with the Rhaslas Drain and dewatering at Nant Llesg has the potential to reduce the baseflow to the river. The deepest part of the excavation is proposed to reach elevations similar to river-bed level, at about 250 m AOD and hence the potential for interception of non-DFDS baseflow and induced leakage from the river is negligible. The interception of the DFDS discharge constitutes a significant volume of water, but this water would be treated as necessary and returned to the river, minimising any reduction in flow that might otherwise occur.
- 10.130. The quality of the river is adversely affected by DFDS discharge containing elevated concentrations of alkalinity, ammonium, EC, dissolved iron, potassium, magnesium, manganese and sulphate. Dewatering during site operations, in particular associated with control of the drainage from the intercepted Rhaslas Drain, would reduce the contaminant load discharging to the river. Treatment of the contaminated water pumped from the excavation during operations, principally using aeration and settlement, would ensure that the downstream quality of the river would be improved.
- 10.131. Mitigation such as the adoption of best working practices and measures to protect the water environment, capping of the MIS Facility before overtipping, and would ensure that the quality of the river baseflow that is not intercepted by the site operations is little affected.
- 10.132. With respect to the two PWSs, at 1.5 km and 2 km northeast of the proposed excavation area, they sit within the theoretical radius of drawdown of up to 3 km. However, they do not lie in the baseline groundwater catchment of Nant Llesg, and are positioned on higher ground on the opposite side of the River Rhymney. This, together with the limited additional drawdown associated with the proposed excavations, means that there would be no impact on both PWS in terms of water level, yield, and quality.

Predicted effects during and following restoration

- 10.133. Cessation of dewatering and recovery in groundwater levels, together with the restoration of the Rhaslas Drain, would restore the pre-existing groundwater flow regime and the baseflow contribution to the river.
- 10.134. The excavation of the coal and other strata would have removed a proportion of the source of contaminants affecting the DFDS discharge and the river, and together with implementation of a backfill strategy agreed with the NRW, this would ensure that the downstream quality of the river would be improved.
- 10.135. The water level, yield and quality of the two PWSs would remain unchanged.

Significance of effects

- 10.136. The River Rhymney (R1) is classed as of “*medium*” sensitivity near Nant Llesg because of its moderate water quality, and because of the return of the abstracted water by way of the WTAs the likely magnitude of change of flow is classed as “*low*” and “*temporary – short term*”. Consequently dewatering and the associated effect on the volume of baseflow contribution to the river is considered to be “*minor*”.

- 10.137. In terms of water quality, the water returned to the “*medium*” sensitivity watercourse would be of considerably better quality than the original groundwater and DFDS water, and therefore the magnitude of change would be “*high*” and a “*moderate*” “*temporary – long term*” benefit. It is important to note that the Coal Authority currently consider that at the present time remediation of the DFDS discharge is otherwise “*probably infeasible mainly due to health and safety concerns of entering the river culvert to capture and transfer the water*” (Coal Authority, pers.comm.).
- 10.138. The two PWSs (PWS1 and PWS2) are at distance from the proposed excavations and beyond the River Rhymney, and therefore the magnitude of change for water level/yield and water quality would be “*negligible*” and “*temporary – short term*”. Given the “*low*” sensitivity of the PWS, this results in “*not significant*” change at both locations.
- 10.139. Following backfilling and restoration, groundwater levels would recover to approximate pre-excavation levels and consequently the baseflow contribution to the river would also return to baseline. The change with respect to baseflow volumes would be of “*low*” magnitude and “*temporary – short-term*”, and in conjunction with a “*medium*” classification for the sensitivity of the river in terms of flow, the overall effect is therefore assessed as minor.
- 10.140. With respect to baseflow quality, the excavation would remove a source of some of the current contamination issues. Furthermore, an appropriate backfill strategy would be developed and agreed with NRW such that any adverse effects on the quality of water discharging to the River Rhymney would be avoided. The change with respect to river quality compared to the baseline is therefore considered to be “*positive*” with a magnitude of change assessed as “*medium*” and “*permanent*”. With the river of “*medium*” sensitivity in terms of water quality, the overall positive effect is considered to be “*moderate*”.
- 10.141. The two PWS would remain unchanged with respect to both water level/yield and water quality following backfill and restoration, again resulting in “*temporary – short-term*”, “*not significant*” change at both locations.

Summary of Predicted Effects

- 10.142. The predicted effects of the proposed development during site operations and following restoration are presented in Tables 10.12 and 10.13 respectively.

Table 10.12 Hydrogeology: Evaluation of Predicted Effects and Significance during Site Operations

Receptor	Probability	Sensitivity	Magnitude	Significance	Level	Rationale
Groundwater Body (GW1)						
Resource	Certain	Low	Medium	Minor adverse		Groundwater levels would be lowered to a maximum depth of 248 mAOD (i.e maximum depth of working), but "regional" water levels already appear low, affected by the DFDS, and the value of the resource is extremely limited locally and affected by water quality issues. There are no local licensed groundwater abstractions that would be affected.
Quality	Unlikely	Low	Low	Not Sig		GW1 has poor existing water quality and is not used for public water supply. The application of relevant Pollution Prevention Guidance Notes (PPGs) to control site activity would minimise the risk of adverse effects on water quality, and capping and ongoing leachate management/monitoring would minimise risks associated with the MIS and Trecatti Landfills.
Rhaslas Drain (GW2)						
Resource	Certain	Low	High	Minor adverse		A section of the DFDS would be removed during the deepest excavations, and water levels in the upstream section would be lowered. However, the DFDS is not regarded as a valuable water resource in its

Receptor	Probability	Sensitivity	Magnitude	Significance	Level	Rationale
Quality	Unlikely	Low	Low	Not Sig		own right. The DFDS has poor existing water quality and is not used for water supply. The application of relevant PPGs to control site activity would minimise the risk of adverse effects on water quality, and capping and ongoing leachate management/monitoring would minimise risks associated with the MIS and Trecatti Landfills.
River Rhymney Baseflow (R1)						
Flow	Certain	Medium	Low	Minor adverse		Dewatering would intercept DFDS and conventional baseflow to the river, but this would be returned to the river by way of the WTAs.
Quality	Certain	Medium	High	Moderate positive		The WTA water would be treated to comply with discharge consents, and the quality would therefore be improved over the original groundwater and DFDS water.
Llechryd PWS (PWS1)						
Resource	Unlikely	Low	Negligible	Not Sig		This PWS is at distance from the proposed excavations and beyond the River Rhymney, and its location means that it would be unaffected by

Receptor	Probability	Sensitivity	Magnitude	Significance	Level	Rationale
Quality	Unlikely	Low	Negligible	Not Sig		site operations. This PWS is at distance from the proposed excavations and beyond the River Rhymney, and its location means that it would be unaffected by site operations.
Princetown PWS (PWS2)						
Resource	Unlikely	Low	Negligible	Not Sig		This PWS is at distance from the proposed excavations and beyond the River Rhymney, and its location means that it would be unaffected by site operations.
Quality	Unlikely	Low	Negligible	Not Sig		This PWS is at distance from the proposed excavations and beyond the River Rhymney, and its location means that it would be unaffected by site operations.
Key:	Probability	Sensitivity	Magnitude	Significance		
	Certain	Very High	High	Major		

Receptor	Probability	Sensitivity	Magnitude	Significance Level	Rationale
	Likely	High	Medium	Moderate	
	Possible	Medium	Low	Minor	
	Unlikely	Low	Negligible	Not Significant	

Table 10.13 Hydrogeology: Evaluation of Predicted Effects and Significance after Restoration

Receptor	Probability	Sensitivity	Magnitude	Significance Level	Rationale
Groundwater Body (GW1)					
Resource	Unlikely	Low	Low	Not Sig	Groundwater levels would recover to near baseline conditions.
Quality	Likely	Low	Low	Not Sig	Groundwater quality will improve locally as a consequence of removal of the coal seams within Nant Llesg, but this represents only a proportion of the total contaminant source. An appropriate backfill strategy would be agreed with NRW and would also provide water quality benefits.
Rhaslas Drain (GW2)					
Resource	Certain	Low	Low	Not Sig	Reinstatement in some form of the section of the DFDS removed during the deepest excavations would allow baseline flow conditions to be re-established.

Receptor	Probability	Sensitivity	Magnitude	Significance	Level	Rationale
Quality	Likely	Low	Low	Not Sig		The DWDS has poor existing water quality and is not used for water supply. The quality of water within the drain will improve as a consequence of removal of the coal seams within Nant Llesg. An appropriate backfill strategy would be agreed with NRW and would also provide water quality benefits.
River Rhymney Baseflow (R1)						
Flow	Certain	Medium	Low	Minor adverse		The baseflow contribution to the river can be expected to return to baseline conditions once the site is restored.
Quality	Certain	Medium	Medium	Moderate positive		Baseflow quality can be expected to improve since a proportion of the strata that is likely to contribute to the existing water quality would have been removed. An appropriate backfill strategy would be agreed with NRW and would also provide water quality benefits.
Llechryd PWS (PWS1)						
Resource	Unlikely	Low	Negligible	Not Sig		As this PWS would not be affected during site operations, no

Receptor	Probability	Sensitivity	Magnitude	Significance	Level	Rationale
Quality	Unlikely	Low	Negligible	Not Sig		effect would be anticipated following restoration.
Princetown PWS (PWS2)						
Resource	Unlikely	Low	Negligible	Not Sig		As this PWS would not be affected during site operations, no effect would be anticipated following restoration.
Quality	Unlikely	Low	Negligible	Not Sig		As this PWS would not be affected during site operations, no effect would be anticipated following restoration.
Key:						
	Certain	Very High	High	Major		
	Likely	High	Medium	Moderate		

Receptor	Probability	Sensitivity	Magnitude	Significance	Rationale
	Possible	Medium	Low	Minor	
	Unlikely	Low	Negligible	Not Significant	

Summary and Conclusions

Key Findings

- 10.143. The proposed surface mine development at Nant Llesg lies in a hydrogeologically low sensitivity area where there is minimal groundwater utilisation. The DFDS provides pathways for groundwater and minewaters to contribute to flows in the nearby River Rhymney to the east.
- 10.144. The assessment carried out has compiled the available hydrogeological information for the site and surrounding area in order to establish the current baseline conditions. Groundwater monitoring data have indicated that water levels are at great depth below the ground surface, at elevations in the range 255–300 m AOD, with a general eastward groundwater flow towards the River Rhymney, and with eastern sections of the DFDS influencing the water levels and the flow pattern.
- 10.145. Samples from recently installed piezometers at Nant Llesg, and existing piezometers at the nearby Ffos-y-fran site, have allowed assessment of local groundwater quality. This has indicated elevated concentrations of several metals, including iron, manganese and zinc. Other water quality data have highlighted the current impact on the quality of the River Rhymney from elevated metals in the discharge from the Bute Watercourse, although monitoring data collected by the NRW indicate that only zinc concentrations have exceeded the EQS for this metal on occasions.
- 10.146. Since the deepest, southern part of the excavation is planned to reach an elevation of 248 m AOD, in order to work the site safely and in dry conditions, it can be anticipated that some dewatering to remove groundwater would be required during mineral production. Though limited in extent and duration, such dewatering would lower groundwater levels in the area and reduce flows in the associated DFDS. Indeed, theoretical calculations suggest that the dewatering would lower groundwater levels by 7 – 30 m over a radius of up to 3 km, and would capture the majority of the water that would otherwise reach the Bute Watercourse by way of the DFDS, and in particular the Rhaslas Drain. The intercepting of the DFDS water in this way would mean that the downstream DFDS would experience a marked fall in flow during site operations. Although there is no flow data for the River Rhymney in this area, groundwater at Nant Llesg provides baseflow to the river, including the discharge from the Bute Watercourse. Consequently, the interference with the Rhaslas Drain and dewatering at Nant Llesg has the potential to also reduce the baseflow to the river.
- 10.147. Dewatering during site operations, in particular associated with control of the drainage from the intercepted Rhaslas Drain, would reduce the contaminant load discharging to the river. In addition, the decoaling would remove a proportion (~20%) of the coal seams and old workings which are contributing to elevated metals and sulphate concentrations, and the quality of the groundwater body and within the DFDS and the receiving River Rhymney could be expected to improve over the baseline in the longer term.
- 10.148. With respect to the two PWSs, at 1.5 km and 2 km northeast of the proposed excavation area, they sit within the theoretical radius of drawdown of up to 3 km. However, they do not lie in the baseline groundwater catchment of Nant Llesg, and are positioned on higher ground on the opposite side of the River Rhymney. This, together with the limited additional drawdown associated with the proposed excavations, means that there would be no impact on both PWS in terms of water level, yield, and quality.

Mitigation Measures

- 10.149. Groundwater management during the main site operations would seek to minimise the effects on the surface and groundwater regime within the vicinity of the site. Where possible, this means targeting any dewatering and attempting to keep surface and groundwater sources of

water within the void separate as far as is practicable. In addition, where highly permeable deposits within superficial deposits (e.g. sand and gravel lenses) are intercepted in the upper sidewalls of the excavations, then these could be sealed with engineered low hydraulic conductivity materials to prevent inflows.

- 10.150. Site operations would involve the use of heavy plant and machinery, and this would result in the need to store oils and diesel with the consequential risks of accidental spillages. The site would therefore adopt best working practices and measures to protect the water environment, including the bunding of fuel storage tanks, control of runoff from metallised surfaces and measures to deal with any fuel spillages.
- 10.151. Investigations are ongoing in order to characterise the on-site MIS Landfill wastes and their pollution potential. Subject to these, appropriate works would be undertaken to engineer and prepare the site to a condition appropriate to be covered by the overburden mound.
- 10.152. It is not anticipated that large volumes of groundwater would be encountered during the early stages of excavation at Nant Llesg. Shallow perched aquifers in superficial deposits and within the bedrock would drain into the excavation, and the water would be allowed to drain from the base of the excavation or be pumped out to WTAs and managed as part of the surface water management scheme.
- 10.153. It is anticipated that the Rhaslas Drain would be intercepted near to the base and southern edge of the excavation. Subject to the quality and quantity of this water, it may be allowed to drain to the base of the excavation, where it can be managed together with surface water run-off that is collected within the void. Alternatively, the water would be collected and pumped from the excavation. This is considered the most likely scenario, and so has been assumed for the purposes of the impact assessment. This scenario requires that water would be pumped initially to WTA 2, from where it would be discharged (following any required flow balancing and treatment) under consent into the River Rhymney via the Nant Llesg watercourse. Appropriate treatment facilities (e.g. the use of aeration, settlement and chemical dosing) would be constructed to promote the precipitation and removal of metals (notably iron) prior to discharge, in accordance with limits to be agreed with NRW, and would assist in improving water quality in the receiving river, as well as compensating for flow losses.
- 10.154. The disruption of the Rhaslas Drain introduced during the site operations would be rectified on restoration by the installation of a replacement adit or some similar construction. This feature would reconnect the upstream and downstream undisturbed elements of the Rhaslas Drain and so would restore DFDS discharges into the Bute Watercourse.
- 10.155. With respect to water quality, the development proposals for Nant Llesg involve the excavation of the overlying rock strata to expose the coal seams. Initially, when excavating the box cut, the overburden would be stored above ground, but subsequently it would be progressively backfilled into the decoaled areas. The stored overburden would then be replaced within the final void following the cessation of coaling operations, as part of the final restoration phase.
- 10.156. The excavation works would remove some of the source of the current groundwater contamination. However, the disturbed overburden would still have the potential to oxidise and leach metals as it becomes saturated, and this could lead to adverse effects on water quality if the appropriate mitigation measures are not put in place. The proposed limited duration of its exposure, especially in terms of progressively restored overburden, means that the effects would be more limited than those from overburden that has been kept in above ground storage for a protracted period. However, it is still important to identify the level of risk to groundwater and implement an appropriate strategy during site operations. A backfill strategy would be required for the site, developed and implemented by means of a planning condition and consultation with NRW, and would be designed to optimise the use of carbonate buffering rock present at the site to minimise the generation of leachate from the backfilled material.

Residual Effects

- 10.157. During site operations, dewatering would result in the lowering of groundwater levels in the vicinity of the excavations. The local groundwater body (GW1) is considered to be of “*low*” sensitivity, based on its secondary status, limited use, and variable and sometimes poor quality. The likely magnitude of change is considered to be “*medium*” and “*temporary – short term*”, since active dewatering is principally only likely to be required when the excavations are at considerable depth, and even then would be largely intercepting DFDS water. Consequently, dewatering and the associated effect on the local groundwater resource are considered to be “*minor*” in environmental impact assessment terms.
- 10.158. Interception and removal of part of the Rhaslas Drain (GW2) during the excavations would result in a “*high*” magnitude and “*temporary – long term*” loss of flow in the down-gradient Rhaslas Drain east of the application site. The DFDS is considered of “*low*” sensitivity on account of its poor quality and the absence of any water users. Therefore, any loss of flow is considered to be “*minor*”.
- 10.159. During site operations, and with the appropriate mitigation in place, it is not anticipated that groundwater quality within the Coal Measures strata or the DFDS would change. With its “*low*” sensitivity and likely “*low*” magnitude, “*temporary – short term*” change, the effect on local groundwater and DFDS quality is considered to be “*not significant*”.
- 10.160. Following backfilling and restoration, groundwater levels would recover to approximate pre-excavation levels. The change with respect to the groundwater resource (GW1) would be of “*low*” magnitude and “*temporary – short-term*”, in conjunction with a “*low*” sensitivity, and therefore “*not significant*”.
- 10.161. The cessation of dewatering, together with reinstatement of the Rhaslas Drain, would also allow flows to be re-established in the DFDS. The change with respect to baseline DFDS flows would be of “*low*” magnitude and “*temporary – short-term*”, in conjunction with a “*low*” sensitivity, and therefore “*not significant*”.
- 10.162. An appropriate backfill strategy would be developed and agreed with NRW such that any adverse effects on the groundwater body (GW1) quality and on the quality of the DFDS and the Rhaslas Drain (GW2) would be avoided. The change with respect to both groundwater quality and DFDS quality is considered likely to be of “*low*” magnitude within a “*low*” sensitivity, hence the effect on these receptors would be “*not significant*”. However the change would be positive and “*permanent*” as a consequence of the removal of the coal seams and old workings from the excavations.
- 10.163. The River Rhymney (R1) is classed as of “*medium*” sensitivity near Nant Llesg because of its moderate water quality, and because of the return of the abstracted water by way of the WTAs the likely magnitude of change of flow is classed as “*low*” and “*temporary – short term*”. Consequently, dewatering and the associated effect on the volume of baseflow contribution to the river is considered to be “*minor*”.
- 10.164. In terms of water quality, the water returned to the “*medium*” sensitivity watercourse would be of considerably better quality than the original groundwater and DFDS water, and therefore the magnitude of change would be “*high*” and a “*moderate*”, “*temporary – long term*” benefit. It is important to note that the Coal Authority currently consider that at the present time remediation of the DFDS discharge is otherwise “*probably infeasible mainly due to health and safety concerns of entering the river culvert to capture and transfer the water*” (Coal Authority, pers.comm.).
- 10.165. The two PWSs (PWS1 and PWS2) are at distance from the proposed excavations and beyond the River Rhymney, and therefore the magnitude of change for water level/yield and water

quality would be “negligible” and “temporary – short term”. Given the “low” sensitivity of the PWS, this results in “not significant” change at both locations.

- 10.166. Following backfilling and restoration, groundwater levels would recover to approximate pre-excavation levels, and consequently the baseflow contribution to the river would also return to baseline. The change with respect to baseflow volumes would be of “low” magnitude and “temporary – short-term”, and in conjunction with a “medium” classification for the sensitivity of the river in terms of flow, the overall effect is therefore assessed as minor.
- 10.167. With respect to baseflow quality, the excavation would remove a source of some of the current contamination issues. Furthermore, an appropriate backfill strategy would be developed and agreed with NRW such that any adverse effects on the quality of water discharging to the River Rhymney would be avoided. The change with respect to river quality compared to the baseline is therefore considered to be “positive” with a magnitude of change assessed as “medium” and “permanent”. With the river of “medium” sensitivity in terms of water quality, the overall positive effect is considered to be “moderate”.
- 10.168. The two PWSs would remain unchanged with respect to both water level/yield and water quality following backfill and restoration, again resulting in “temporary – short-term”, “not significant” change at both locations.

Cumulative Effects

- 10.169. The key potential cumulative impact would be associated with the works that would be undertaken at the MIS landfill site within the proposed scheme to cap the landfill prior to the use. This would be dispatched through the CDP, where the existing measures to prevent hydrological effects are considered suitable to prevent any off-site effects.

Conclusions

- 10.170. The hydrogeological impact assessment has established that the proposed site operations and restoration would have no significant negative impacts on the limited number of water features identified in the Nant Llesg area. A “temporary – long term”, “moderate”, benefit would be achieved during the operational phase of the site by intercepting and treating DFDS waters before they are returned to the River Rhymney, and a “permanent”, “moderate” benefit to water quality would be obtained in the longer term by the removal of contaminating coal seams and by the implementation of a suitable, and NRW-approved, backfill strategy. It is important to note that the Coal Authority currently consider that at the present time remediation of what is regarded as the second worst unmitigated discharge in Wales is otherwise “probably infeasible mainly due to health and safety concerns of entering the river culvert to capture and transfer the water” (Coal Authority, pers.comm.).
- 10.171. An extensive surface water and groundwater monitoring scheme would be agreed with NRW which is anticipated would incorporate existing borehole and stream monitoring locations. This would serve to monitor the effects of the development and site restoration on local groundwater levels and surface water and groundwater quality and inform mitigation actions. Appropriate consents and licences would be obtained from NRW for water management at the site.

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These details will put you in touch with PPS Group which coordinates our Nant Llesg public consultation activity.