

CONTENTS

INTRODUCTION	3-1
OVERVIEW OF THE PROPOSED DEVELOPMENT	3-1
Development Phases	3-2
CONSTRUCTION PHASE	3-3
OPERATIONAL PHASE	3-4
General	3-4
Weathered Slate	3-4
Slate	3-4
Dyke	3-5
Reserves	3-5
Mineral Waste Tipping	3-6
Operating Hours	3-6
Leat	3-7
RESTORATION	3-7
ALTERNATIVES	3-9
Legislative Requirement	3-9
Alternatives Considered	3-9

INTRODUCTION

Under Regulation 17(3)(a) of the EIA Regulations an ES should provide a as a minimum *“a description of the proposed development comprising information on the site, design, size and other relevant features of the development”*.

- 3.1 Schedule 4 indicates that, where relevant, the ES should provide a description of the development, including in particular:
- a description of the location of the development;
 - a description of the physical characteristics of the whole development;
 - a description of the main characteristics of the operational phase of the development
 - an estimate of expected residues and emissions and quantities and types of waste produced during the construction and operation phases.
- 3.2 In addition, it is normal practice for planning applications for mineral development to be accompanied by a supporting statement that describes, inter alia, the development proposals. As such, there is an overlap in the requirements of an ES and what is considered good practice for the submission of planning applications. Accordingly, Volume 1 (Planning Statement) also includes a description of the development. This chapter sets the basis against which the EIA has been conducted.

OVERVIEW OF THE PROPOSED DEVELOPMENT

- 3.3 The principles of the quarry development scheme were established at the time of granting planning permission for an extension to the working area in 2012 (permission ref. C12/0874/16/MW and referred to as the ‘re-alignment application’). Details submitted to the MPA included a comprehensive working scheme for the remaining reserves at the quarry, involving the development of the quarry in a series of benches being advanced in a south-westerly direction. The working scheme was then reviewed under the Environment Act 1995 as part of the ‘Review of Old Mineral Permissions’ process.
- 3.4 The approved scheme can be divided into the following distinctive operations:
- mineral extraction (within the southern quarry);
 - mineral waste tips (within the southern quarry and periphery of northern quarry);
 - mineral processing for secondary aggregates (within the northern quarry area);
 - production of roofing slates and ancillary building products (within the northern quarry area);
 - mineral stockpiling (within the northern quarry area);
 - slate products stockpiling (within the northern quarry area);

- removal of material from historic waste tips (within the northern quarry area);
- site offices and administration (northern quarry area);
- weighbridges and office (northern quarry area);
- restored mineral workings.

3.5 In the context of the proposed extension, it is only the mineral extraction and restoration (due to the subsequent change to the final profile of the quarry workings) that are relevant to the consideration of the planning applications and notably this EIA. All other aspects of the development of the quarry, including waste tipping and haulage would be undertaken in accordance with the approved scheme.

3.6 Under the current planning permission the above operations can continue until 31 December 2032, with final restoration to be completed by 31 December 2034 (condition 2 of planning permission C16/1164/16/MW refers).

3.7 In order to demonstrate the acceptability of the development proposals, a development scheme has been prepared and is described in this section. In general terms it is proposed that the extraction operations reflect current practices and remain largely as currently permitted. Slate extraction has been phased to ensure that the application site is worked in an efficient and systematic manner, and ensures potential environmental impacts are kept to acceptable levels whilst maintaining an adequate supply of quality of slate for the production of roofing slates etc. This underlines the applicant's intentions and responsibilities to conduct its activities as a responsible neighbour and in a manner which is sympathetic to local amenity and causes minimal disruption to the local community. In preparing the working scheme, consideration has been given to the following constraints:

- Landscape and Visual Impact;
- Hydrology and hydrogeology;
- Ecological considerations;
- Archaeological considerations; and
- Proximity of dwellings and the likely environmental impacts in terms of noise and dust;

Development Phases

3.8 The proposed development can be divided into the following key stages:

- Quarry site preparation works (i.e. soil/overburden stripping);
- Mineral extraction;
- Mineral waste tipping; and
- Restoration.

CONSTRUCTION PHASE

- 3.9 As an established mineral operation site infrastructure is already in place. This includes:
- site access;
 - wheel wash (located on the metalled access road close to the processing infrastructure);
 - haul road (between access point and processing infrastructure);
 - processing plant/buildings; and
 - internal secondary haul roads between face and plant/overburden disposal areas.
- 3.10 To facilitate the extraction of slate within the proposed extension soils (peat) and overburden would need to be stripped to expose the slate rockhead. As noted in Chapter 2 above, there are no soils of agricultural quality within the working area and thus usual soil handling techniques (such as former MAFF's Good Practice Guide for Handling Soils, published in 2000, as updated by the Institute of Quarrying Good Practice Guide for Handling Soils in Mineral Workings¹) do not need to be observed.
- 3.11 Soils and overburden would be removed separately in stages to allow for the working of annual blocks of overlying weathered slate so revealing the high quality slate for production purposes.
- 3.12 Typically, soils and overburden are stripped using a hydraulic excavator and transported across the site to the storage locations in articulated dump trucks. As per the current planning permission, the precise location of soil storage areas would be provided to the MPA prior to the commencement of soil stripping operations (condition 6 of planning permission C16/1164/16/MW refers).
- 3.13 Previous ecological surveys have identified some features of interest and the extant planning permission contains conditions relating to ecological works required prior to stripping. This includes further walk over survey work for lichen and reptiles for example. Should any boulders be identified as having lichenological interest, then they are to be removed from the working area. Allied to this, archaeological walk over surveys are required prior to stripping. These measures would be employed as part of the development of the proposed extension. In this context, further lichen surveys have been undertaken in 2019 and are reported in Chapter 7 of this volume).
- 3.14 Finally, archaeological investigations have been carried out in the vicinity of a feature referred to as "*the sheepfold*", which is located within the extension area. Whilst the sheepfold itself is considered to be post-medieval, it overlies an Iron Age settlement. To date, hand dug pits and trenches have been excavated in two successive phases of investigation. Following this investigation it has been agreed that no further site work is required save for a programme of recording and controlled demolition will be instigated prior to development. This is considered further in Chapter 8 of this volume.

¹ [Soils Guidance \(quarrying.org\)](http://quarrying.org)

OPERATIONAL PHASE

General

- 3.15 The approach to development at the quarry is dictated by the geological conditions. Extensive drilling and mapping of the current permitted workings has determined the location of the prime in-situ quality slate. The upper sequence of slate is weathered and fractured to a depth of 55/65 metres from the surface.
- 3.16 The method of operation within the proposed extension would be in accordance with permitted current practice subject to variation in order to satisfy localised conditions. The following paragraphs provide a description of the operations.

Weathered Slate

- 3.17 Horizons of weathered slate would be drilled and blasted with tracked excavators loading dump trucks for transport to the pre-identified tip. Blasting is undertaken in accordance with the requirements of the Health and Safety legislation as applicable to quarries and other open pit mining operations. Typically, weathered slate is found within the top three benches of the quarry workings.
- 3.18 In general terms, the weathered rock is worked by drilling a row or rows of boreholes (often referred to as shot holes) into the rockhead above, and behind, the working quarry face using an air flushed drill rig with dust suppression equipment. Predetermined quantities of explosive are placed into each hole and the spaces between the charges and the top sections of the holes are “stemmed”, usually with 10mm aggregate. Each charge is connected to the next in line and fired sequentially by the use of millisecond delay detonators. This delayed sequence, together with the amount of explosive charge and the shot hole spacing is employed to reduce both noise and ground vibration caused by the explosion in accordance with good environmental practice.
- 3.19 Blasting would only occur within set times of the day and holes are only charged within a few hours of use.
- 3.20 Under the extant planning permission conditions 26 to 30 regulate blasting operations and development within the proposed extension would also be undertaken in line with these conditions. This is set out further in Chapter 12 of this volume.

Slate

- 3.21 Extraction of the quality slate is undertaken to minimise fragmentation and so maximise the recovery of slate suitable for conversion into roofing or cladding slates.
- 3.22 To reduce the amount of waste slate produced, wire saws were introduced which increased the yield and results in minimal impact on the advancing face. Notwithstanding this, it is not always feasible to employ sawing, such as the lower faces within the quarry workings; in such instances ‘black powder’ blasting is used for block recovery. By widening the workings, as proposed by the

extension, it will become feasible to use sawing on the lower faces which will improve the recovery of primary (roofing) slate and reduce waste.

- 3.23 Extracted slate is transported from the face to the processing area by dump trucks using haul roads that are routed along the working benches and join with the main haulage route located on the western side of the quarry voids.
- 3.24 Operations within the proposed extension would represent a continuation of the practices established at the quarry. The form of the extended quarry workings is illustrated on GWP Drawing 19WPENP2110GS contained within the GWP Geological Report in **Appendix 2/1**.

Dyke

- 3.25 As noted in Chapter 2, the strata are cut by numerous sub-vertical dolerite dykes of Ordovician age. The effects on the adjacent baked slate aureole are generally restricted to within 3 to 4m of the dyke margins. However, the recently exposed large dyke at the southern end of the South Quarry displays distinctly different characteristics. In this instance the slate well beyond the baked margins of the dyke is intensely fractured and altered such that no workable material for producing slates can be recovered from this area. The margin of unworkable slate extends 25m either side of the dyke margins.
- 3.26 The dyke obliquely cross cuts the advancing south-western faces and has had significant impact on how the quarry is being worked. The best quality slate is present at depth, and because of the fixed excavation limits and fault bounded geological domain boundaries, the productive working face length significantly reduces with depth. The 25m highly fractured margins either side of the dyke sides means that much of the productive working face is lost when working within the broken slate aureole. This is exacerbated due to the step in the north-western excavation boundary. In total the dyke and effected broken slate margin result in the loss of at least 1.11Mt of what would have been premium slate for slate making purposes.
- 3.27 This has meant that in order to keep up with production requirements the broken slate (now waste) is removed and the benches where areas of workable slate remains have to advance more rapidly than had previously been anticipated. Workable face lengths are reduced and timescales for production mean that wire sawing is not possible and black powder has to be resorted to. The yield from in situ slate is markedly reduced using black powder shots. This again reduces the life span of the accessible good quality slate.
- 3.28 Recent experience has shown that associated with the dyke, the depth of weathering in the in situ slate also increases such that productive slate is only found below c. 330mAOD. Again this reduces the available quantity of workable slate.

Reserves

- 3.29 Based on the latest geological modelling of the approved quarry development scheme, reserves of good quality slate (for roofing and aggregates) is estimated at 3.3Mt; this takes into account the reserves lost as a result of the substantial dyke which cuts across the current workings. This

resource is only sufficient to sustain production for around 10 years. However, it has now been found that the Holywell bench will not yield any roofing slate.

- 3.30 By extending the quarry workings as set out in this document, the resource of good quality slate (for roofing) increases by 0.25Mt to 3.6Mt whilst the resource of slate in the Red and Blue domain for decorative aggregates increases by around 1.9Mt to 3.1Mt; the additional resources are all within the coloured slate domains (purple and reds/blues). This increase in the total resource would sustain production for around an additional three years (but again would be reduced due to the lower yield from the Holywell bench).

Mineral Waste Tipping

- 3.31 In common with most quarrying operations there is a need to dispose of overburden, inferior rock and mineral wastes. However, unlike conventional aggregate quarries, the volume of material to be tipped is significantly greater, typically representing over 75% of the material extracted. Put into context, each month around 49,000m³ of material is sent to tip. Notwithstanding this, the applicant is actively exploring options for reducing the amount of material sent to tip by marketing the material as a secondary aggregate product.
- 3.32 Overburden takes the form of a peaty material/glacial superficial deposits, below which is the weathered slate. These materials are not suited to processing and need to be disposed within tips, which are located on the western periphery of the quarry and between the north and south quarries. The majority of other material produced in the quarrying operation is either used in the production of slate products, or suitable for processing with the aggregates plant.
- 3.33 Extant planning conditions, such as condition 42 in planning permission ref. C16/1164/16/MW, provides that tipping operations shall be directed towards the production of final landforms and shall more specifically avoid any conical tip forms, horizontal or straight tip profiles or regular horizontal benches.
- 3.34 In August 2015 details were submitted to the MPA regarding the temporary storage of materials within Tip E2 (located on the western edge of the quarry), but above the final restoration profile. The revisions to the E2 Tip area accommodates 111,298m³ of tip material which will include overburden and weathered slate. Upon final restoration, all tips will be regraded in accordance with final restoration contours illustrated on the Permitted Restoration Scheme (Drawing P7/106A contained in the Environmental Statement for the ROMP review), and also shown on the new Restoration scheme (**Drawing PQ 6/15**).
- 3.35 In view of the reduced scale of the proposed extension, coupled with efforts to reduce the amount of waste sent to tip, it is considered that the current arrangements are sufficient. This will though be kept under review as part of the 5 yearly development plans that need to be provided under the extant planning permission (condition 5 of planning permission C16/1164/16/MW refers).

Operating Hours

- 3.36 Under planning permission ref. C16/1164/16/MW there are no restrictions on operating hours. Notwithstanding this, conditions 17 and 18 set noise limits for certain times of the day, with

condition 18 restricting 'temporary operations' (i.e. overburden stripping) to between 0600 and 1900 hours.

3.37 Under planning permission ref. C16/1164/16/MW, condition 24 provides restrictions on blasting, drilling and soil stripping/overburden removal as follows:

- Blasting
 - 1000 to 1600 hours Monday to Friday;
 - 1000 to 1300 Saturdays;
 - No blasting on Sundays, bank or public holidays.
- Drilling
 - 0700 to 1900 hours Monday to Friday;
 - 0700 to 1300 hours Saturdays;
 - No drilling on Sundays, bank or public holidays.
- Soil/Overburden stripping
 - 0700 to 1900 hours Monday to Friday;
 - 0700 to 1300 hours Saturdays;
 - No drilling on Sundays, bank or public holidays.

Leat

3.38 Previous assessments have considered the drainage strategy for the quarry.

3.39 A wet heathland and peat bog known as Gwaen Gynfi lies down slope of the permitted development at Penrhyn and without mitigation, Gwaen Gynfi could be adversely affected by a reduction in surface water flow.

3.40 The approved mitigation scheme comprises an interception leat up slope of the permitted extraction area so preventing the inflow of up catchment water into the quarry voids and thereafter off site via the existing water discharge consent. This catchment water is diverted around the edge of the excavation and discharged back onto the hillside so flowing into the wet heathland. Work on the construction of the surface water leat commenced in October 2014 with further remedial works undertaken in 2016 following discussions with Natural Resources Wales.

3.41 By amending the extraction boundary for the proposed extension, no changes to the leat are required and it will continue to be monitored in line with the extant planning conditions attached to permission C16/1164/16/MW. This is set out further in Chapter 8 of this volume.

RESTORATION

3.42 As part of the ROMP review a comprehensive restoration scheme was approved for the quarry workings, based on earlier reviews undertaken in 2014 and 2012. The applicant's approach to restoration of their operations is as follows:

- the aim of the restoration programme is to encourage the natural process of regeneration in reinstated land affected by quarrying activity. Many areas of the quarry have regenerated

naturally. These areas are considered by the applicant as a conservation model to follow and as a precedent for the restoration and management for the rest of the quarry. Sections of the landholding are subject to agricultural tenancies, including wetland and heathland, untouched by quarry working and regularly inspected to maintain their conservation value.

- whilst taking into account the need for wildlife conservation and enhancement, the applicant has implemented a sympathetic approach to restoration having regard to the historic value of the local landscape and the impact of the quarry on local residents.
- development of restoration areas is considered a continuous process requiring forward planning, assessment and preparation of the next stage. This enables the applicant to integrate the restoration of the quarry in parallel with the expansion of the quarry.
- many of the techniques and skills developed and used in this process are unique to the applicant. It is understood that there are no other restoration / reinstatement programmes within the quarrying industry of this scale and duration currently taking place in North Wales.
- all trees, shrubs and heathers as well as many of the grasses and wild flowers etc. are of local provenance. Collected from local seed sources, propagated and grown at the purpose-built nursery at Penrhyn Quarry, this maintains the genetic integrity of planting stock. Only green compost is used in the growing and planting procedures.

3.43 Two types of planting procedures are employed at the quarry:

1. The first procedure is followed where tip slopes are relatively easy to access on foot. When planted out onto the tips, trees and shrubs are placed in hessian sacks containing 1.5 litres of compost and buried in place. This allows enough growing medium and nutrient for the plants to establish, no fertiliser being added. The sack gradually biodegrades over a period of between 12 / 14 months allowing the root system plenty of time to establish.

The vegetation that is to be introduced is applied to specific areas over the tips by means of pocket planting in discrete blocks. All seeds are pre-germinated before application.

2. The second procedure is followed where tip slopes are difficult to access on foot. Due to the steep angle of some of the tips, access to planting areas is extremely difficult; the methods used are seed balling and pocket planting on steep gradients and the sack method at the base of the slope. Seed balling is a method that has been developed at Penrhyn Quarry and involves the manufacturing of balls of compost with pre-germinated seeds. These are then cast down the tips where they find their own lodging point on the slope. Over time, the seeds develop within their pocket of compost.

3.44 The proposals do not seek to amend the approach to restoration that has previously been approved. However, a new Restoration Scheme (see **Drawing PQ 6/15**) has been prepared to show how the extension can be assimilated into the wider workings.

ALTERNATIVES

Legislative Requirement

3.45 Alternatives are considered in the context of Regulation 17(3)(d) and paragraph 2 of Schedule 4 of the Town and Country Planning (Environmental Impact Assessment)(Wales) Regulations 2017. Firstly, Regulation 17(3)(d) states that an EIA Report should include:

“a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment.”

3.46 Paragraph 2 of Schedule 4 expands upon this by adding that the information to be provided (where appropriate²) should include *“A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.”*

3.47 Guidance contained in the Planning Practice Guidance portal comments³ that *“the 2017 Regulations do not require an applicant to consider alternatives. However, where alternatives have been considered, paragraph 2 of Schedule 4 requires the applicant to include in their Environmental Statement a description of the reasonable alternatives studied (for example in terms of development design, technology, location, size and scale) and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects”*.

3.48 The main purpose of considering alternatives within an EIA is to consider whether any alternative designs have been considered as part of the process. This could relate to operational practices or phasing of the development for example. Given the existence of an extant planning permission for slate extraction; the established nature of the site (and associated infrastructure) and the limited extent of the proposed extension it is not considered necessary or appropriate to give consideration to any alternative sources of slate.

Alternatives Considered

3.49 The nature of the development is such that very few alternatives present themselves for consideration as part of the EIA.

3.50 The main alternative considered as part of this project was a larger extension to the workings (taking in 4.3 ha, so approximately twice the area). A scheme was prepared and assessed through the EIA process, as reported in a draft ES produced in 2020. The ES, and other documents prepared

² Regulation 18(3)(f) indicates that information contained in Schedule 4 is to be provided where relevant to the specific characteristics of the development.

³ Paragraph: 041 Reference ID: 4-041-20170728

for the planning application, were subject to the statutory Pre Application Consultation process. Through this process and the consultation response from Natural Resource Wales it became apparent that a smaller scheme should be pursued which avoided the priority habitat within the SAC.

- 3.51 The consideration of alternatives also includes the “*do nothing scenario*”. In the absence of the proposed extension, the quarry would continue to experience difficulties in working due to the dyke, coupled with the narrow configuration of the quarry workings. Moreover, some 2.2Mt of good quality slate would be lost, curtailing the potential life of the quarry, the associated employment it generates and the ability to supply high quality slate products to the market (which is local, national and international).