

GWRHYD QUARRY, PONTARDAWE

APPENDIX 4.0

REVISED WORKING AND RESTORATION PROGRAMME

This document is to be read in conjunction with the following Plans which are included at Appendix 2.0

A1.2 (Revised) Planning Application Area	October 2023
170-01-1A: Phase 1A Current Extraction 2023	
170-01-1B: Phase 1B Extraction	
170-01-2: Phase 2 Extraction	
170-01-3: Phase 3 Extraction	
170-01-REST: Proposed Restoration Concept Plan	
Development Cross Sections	August 2023

October 2023

Carter Jonas

PHASED WORKING AND RESTORATION PROGRAMME

Overview

1. The original working programme for the quarry was approved under planning application reference (PA ref.) 2010/0026 (the 2011 consent) and is illustrated on the following Drawing Numbers (Dwg. Nos.).
 - Dwg. No. A1.2 (Revised) April 2010 Planning Application Area
 - Dwg. No. A3.1 April 2010 Topographical Plan
 - Dwg. No. A2.4 (Revised) May 2010 Proposed Quarry Development Phase 1
 - Dwg. No. A2.5 (Revised) May 2010 Proposed Quarry Development Phase 2
 - Dwg. No. A2.6 (Revised) April 2010 Proposed Quarry Development Phase 3
 - Dwg. No. 2.7 (Revised) April 2010 Proposed Restoration Context
 - Dwg. No. 2.8A (April 2010) Cross Section through Quarry Phases
2. These approved drawings envisaged the operation commencing at the southern end of the defined quarry extraction limit and developing in a northerly direction with progressive restoration.
3. Whilst the overall phasing and direction of working remained generally consistent with the 2011 consent, in 2017 it was necessary to seek amendments to the approved programme to take account of the need to store mineral waste within the quarry, the volume of which had significantly exceeded that of saleable product and hampered the intended progressive restoration.
4. In 2017, the operation had not reached the maximum permitted depth of extraction and consequently there was a requirement to surcharge quarry waste above initially proposed restoration levels. The 2017 programme sought to overcome this and the lack of operating space within the quarry by the re-working of the waste tips and recovery of stone aggregate which was not considered useable by the previous operator. The reasons for changes are explained in detail in the 'Approval of Reserved Details Report' dated June 2018¹, which was submitted with the 2017 application.
5. In 2018, the Mineral Planning Authority (MPA) granted a change to Condition 7 of the 2011 consent to allow for the temporary crushing and export of stone from the quarry. PA ref. 2017/0036 (2018 consent) was accompanied by a suite of plans showing the consequential revisions to the original working scheme based on the working programme and the topographical survey at that time.
6. The following drawings were approved under the 2018 consent (Condition 4).
 - Dwg. No. JA-072-001-018.2 Phase 1 excavation design
 - Dwg. No. JA-072-001-018.3 Phase 2 excavation design
 - Dwg. No. JA-072-001-018.4 Phase 3 excavation design
 - Dwg. No. JA-072-001-018.5 Phase 4 Restoration Design
 - Dwg. No. JA-072-001-018.6 Cross Sections
 - Dwg. No. JA-072-001-018.7 Area of Early Restoration
7. Whilst they sit alongside the originally approved drawings (Condition 2) of the 2018 consent, the above drawings illustrate the most recently approved working programme for the quarry and provide the most relevant and up-to-date position against which to consider the minor changes to

¹ Produced by James Associates

the working and restoration programme which are now proposed. The revisions are illustrated on the following plans which are included at Appendix 2.0 to the planning application.

- A1.2 (Revised) Planning Application Area, October 2023
 - 170-01-1A: Phase 1A Current Extraction, October 2023
 - 170-01-1B: Phase 1B Extraction, October 2023
 - 170-01-2: Phase 2 Extraction, October 2023
 - 170-01-3: Phase 3 Extraction, October 2023
 - 170-01-Rest: Proposed Restoration Concept Plan, October 2023
 - Development Cross Sections, August 2023
8. As set out in the Planning Statement for this planning application, the working programme and restoration programme remain fundamentally unchanged. They are based on 3 development phases, working in a broadly south to north direction, within the approved lateral extent of the quarry and to the approved working depth. The site would be restored to a low-level, using non-recoverable mineral waste and returned to agriculture use.
9. The revisions are based on the 2023 topographical survey, a better understanding of the mineral reserve and mineral waste tip volumes yet to be extracted and removed, as well as the proposal to recover a greater proportion of high-quality aggregate from the remaining waste material which would otherwise be sterilised. The revised working and restoration programme is informed by the 'materials balance' summarised below.

Materials Balance – updated 2023

10. The following soil storage volumes have been calculated based on the 2023 topographical survey of the quarry and the revised phased working programme and accompanying drawings which are described in the remainder of this document.

Table 1 – Soil Storage Details

Item	Estimated Volume(m ³) ² as at July 2023
Soils stored in peripheral bunds at north-eastern boundary of the Quarry	3,300 plus 4,666
Soil forming material in mound at north-western end of Quarry	9,615
Soil forming material in mound to the south of the processing area	1,252
In-situ sandstone remaining: Potentially recoverable volume (reflecting 25% wastage):	221,451
Volume of quarry waste currently located in tips	75,578

Waste Material

11. Approximately 50% of the 75,578m³ material located in the tips remains available for restoration and 50% is recoverable mineral, being a mix of dimension stone and aggregate. However, the true recoverable volume will not be known until the tip is worked.

² Indicative and subject to variation with actual waste ratios, bulkage.

Mineral Reserve

12. Of the mineral reserve, approximately 75% (166,000m³) is capable of producing blockstone. Of this, 25% is waste generated from the cutting process, however, it is proposed to recover all this as aggregate. The remainder of the reserve would be mineral waste to be used as restoration material (55,360m³).

Estimated recoverable mineral and restoration materials

13. Based on the above, with the recovery of aggregate from the waste material within the tips and arising from the remaining reserve, in addition to block and masonry stone, there remains an estimated:
 - Recoverable material for mineral products = approximately 203,880m³; and
 - Restoration materials = approximately 111,990m³
14. The proposed minor revisions to the 3 development phases and the restoration programme reflect this up-to-date information and are described in detail below.

Development Phase 1 – Approved 2018

15. The 2018 consent working programme envisaged two operations taking place during Phase 1 (as illustrated on Dwg. No. JA-072-001-018.2):
 - a) the extraction of in-situ rock for processing into sawn/riven products; and
 - b) the processing of waste arising from the quarry and re-processing of tipped waste from the large tip along the southern and eastern sides of the quarry on top of the original hillside slope.
16. The temporary re-processing of the tipped quarry waste was envisaged to last for 2-years, during which the lack of operating space within the quarry would be alleviated and further reserves at the southern end of the quarry would be uncovered and made available for extraction.
17. Access to the quarry would be from the north, along the eastern side of the site, to enable the consented limit of stone extraction to be achieved at the southern end and surcharged quarry waste to be removed and re-processed.
18. The quarry operation would continue to be deepened at the southern end of the quarry from west to east to a level of 238m AOD in Phase 1. Extracted blockstone would be transported from the southern end of the site to the block storage area to the north of the processing area.
19. Quarry generated waste would be tipped at the northern end of the quarry with a temporary dust tip at the southern end of the site.
20. During Phase 1 no significant restoration was proposed to be achieved other than to remove the tipped quarry waste deposits located along the eastern side of the site which lie above original ground level.
21. It was anticipated that, when exposed, the outer eastern facing slope would be re-seeded using a mix specification agreed with the MPA.

Development Phase 1 – Revised 2023

22. Quarry operations have continued to be undertaken in accordance with Phase 1 of the 2018 approved Working Programme as illustrated on the annotated aerial photograph below.



23. Access to the quarry remains from the north, along the eastern side of the site, to enable the consented limit of stone extraction to be achieved at the southern end. The general lateral direction of working remains the same, from south to north. The 'direction of working' shown on the above image reflects the deepening of the quarry to the approved depth.
24. Extracted blockstone continues to be transported from the southern end of the quarry to the block storage area to the north of the processing area, while quarry generated waste continues to be tipped at the northern end of the quarry.
25. However, minor revisions are required primarily because it has not been possible to remove the quarry waste tip along the eastern side of the quarry in its entirety. Extraction Phases ref. 170-01-1A and 1B October 2023 update Phase 1, based on the topographical survey July 2023. The rationale for the revisions is described in more detail in the following paragraphs.
26. Condition 7b) of the 2018 consent allowed for aggregate processing and export over a temporary period. Quarry operations have, therefore, been focused on the re-working and processing of the southern end of the quarry waste tip, along the eastern side of the quarry, which previously amounted to approximately 122,500m³. The rate of processing was governed by the permitted volume limitations for export of aggregate produced from waste stone. Owing to these limitations, not all the quarry waste tip material was removed.
27. Based on the 2023 topographical survey, it is estimated that approximately 75,578m³ of quarry waste remains located across the quarry tips.
28. Removal of a large part of the southern end of the quarry waste tip has opened a larger working area within the permitted extent of the quarry and exposed the reserves in the south-eastern corner. This has provided an increased working knowledge of the reserves since the most recent working programme was submitted in 2017.
29. It is proposed to remove the recoverable element of dimension stone/aggregate with the remainder being used for restoration.
30. During the partial removal of the eastern quarry waste tip, its profile was re-graded to reduce the previous steep gradient on the eastern face of the tip and to enable the peripheral haul road to be benched. This has achieved a shallower and consequently safer tip face gradient.
31. This eastern peripheral haul road provides access from the northern end of the quarry round to the

south-eastern corner of the quarry which has been exposed for extraction, following the removal of tipped quarry waste.

32. Extraction in the now exposed south-eastern corner of the quarry has progressed to a level of approximately 234m AOD. It is intended to continue extraction in the southern end of the quarry to create a uniform level between the south-western corner (currently at 239m AOD) and south-eastern corner before progressively deepening the working area in accordance with Phase 1 of the 2018 consent.
33. When the maximum depth of the deposit has been reached at the southern end of the quarry (estimated at 220m AOD), working will progress in a northerly direction. As extraction progresses to the north, the base of mineral extraction will gradually increase in line with the assumed base of the recoverable mineral reserve.
34. To date there have been no opportunities for progressive restoration as the operational space within the quarry is focused on areas of ongoing extraction which are subject to deepening. This includes the seeding of the eastern face of the eastern quarry waste tip, as this will be subject to further re-profiling/re-processing during Phases 1 and 2.
35. It is envisaged that as mineral extraction within Phase 1 progresses to the north, the eastern tip material will need to be progressively relocated to the southwest of the quarry and backfilled. Whilst the Extraction Phase 1 Plan is indicative based on estimated waste ratios/compaction rates, etc. it is estimated that this section of the quarry will be backfilled to approximately 235m AOD. This progressive backfilling will be in line with the progressive restoration of the quarry whilst exposing future reserves along the eastern half of the quarry to enable extraction to progress northwards.

Development Phase 2 – Approved 2018

36. The 2018 approved Working Programme would continue Phase 2 extraction in an easterly direction down to the base of the mineral deposit (approximately 220m AOD at the southern end of the quarry), as shown on Dwg. No JA-072-001-018.3.
37. Waste material generated by the quarrying operation would be accommodated within the excavation void and where possible be placed directly in its final place (as part of the restoration profile) in the south-western corner of the void.

Development Phase 2 – Revised 2023

38. The updated Phase 2 is illustrated on the Extraction Phase 2 Plan (ref. 170-01-02). Mineral extraction will be focused on the north-eastern section of the quarry.
39. This Phase differs slightly from the 2018 Phase 2 Plan. While extraction is shown to be moving northwards under both plans, the 2018 scheme was focused on the extraction of the central quarry area due to the assumption that the tip would have been fully removed, thus affording greater operational space. The updated Phase 2 reflects the relocation of the remaining tip material as part of a progressive restoration of the southern half of the quarry which will enable access to mineral reserves in the north-eastern corner of the quarry. This has also required the repositioning of the quarry haul road.
40. Following Phase 1, where the southern half of the quarry will have been extracted down to the base of the recoverable mineral, the resultant voidspace at the southern end of the quarry will enable the relocation of the remaining material from the eastern tip to be backfilled, along with waste material generated by ongoing mineral extraction and processing into the southern half of the quarry.

41. It is estimated that the backfilling of the southern half of the quarry will be restored to an approximate level of 234m AOD.
42. Waste material, including that in the northern waste tip would be re-profiled to develop a new quarry haul road from the north-western corner of the quarry down to the extraction area in the north-eastern quadrant of the quarry at an appropriate gradient.
43. The working area within this quadrant will be at a base level of between 235m at the southern end and 246m AOD at the northern end.

Development Phase 3 – Approved 2018

44. The 2018 approved Phase 3 (Dwg. No. JA-072-001-018.4) would see the extraction operation develop in a northerly direction towards the final consented limit of excavation.
45. Waste materials contained within Tip 1 (as shown on the Phase 1A Current Extraction 2023 Plan) would be progressively excavated and placed directly against the western and southern quarry faces to create a replacement access ramp down into the quarry floor/working areas as the original eastern ramp is excavated away.

Development Phase 3 – Revised 2023

46. This will be the final extraction Phase. It is in accordance with the 2018 approved Working Programme except for the proposal to work the eastern then western half of the quarry to enable progressive restoration and the position of the haul road access ramp.
47. The updated Phase 3 of the Working Programme is illustrated on the Extraction Phase 3 Plan (ref. 170-01-3) and sees extraction remaining in the northern end of the quarry and focused on the north-western quadrant of the quarry.
48. This will be achieved by the relocation of the previously tipped material beneath the Phase 2 haul road to the fully extracted north-eastern quadrant of the quarry. The material will be backfilled and appropriately compacted and graded to achieve an appropriately graded haul road, which will enable access from the north-eastern corner of the quarry down into the final extraction area, which will be extracted to an estimated base level ranging from 239m AOD at the southern end to 247m AOD in the northern end.

Development Phase 4 – Approved 2018

49. The 2018 approved Phase 4 Drawing No. JA-072-001-018.5 illustrates the final restoration concept for the site, which comprises the following measures and features.
 - Final tipped slopes at the southern end of the site which will be profiled then dressed with dust contained in Tip 2 (as shown on Phase 1A Current Extraction 2023).
 - Tipped slope surfaces will be dressed to a depth of approximately 0.5m using the soils which are contained in the two existing soil tips located at the north-eastern end of the site.
 - Residual rock faces will be left along the northern half of the western face, the northern and eastern side walls.
 - The quarry floor and graded slope with access track to the quarry floor) will be grass seeded using a mix agreed with the MPA.
 - The proposed afteruse of the quarry area and restored grassed slopes will be for agriculture pasture, returning the site to its original use.
 - The water treatment area at the southern end of the quarry will be retained as will the

existing drainage system. The dividing wall between the two easternmost lagoons along with the liner will be removed and the area left to regenerate naturally as ephemeral wetland. Tree planting around the lagoons is proposed with the species mix to be agreed with the MPA.

- The following buildings/structures would be removed.
 - Site office.
 - Welfare facilities.
 - Open fronted processing shed.
 - Staff car park (may be used for agricultural supplies/vehicle storage).

Development Phase 4 – Revised Restoration Concept 2023

50. The Restoration Concept is illustrated on Plan ref. 170-01-Rest. as described below.

- Final restoration profile of the southern half of the site will be profiled to a level landform of between 234m AOD and 235m AOD.
- Tipped slope surfaces will be dressed to a depth of approximately 0.5m using the soils which are contained in the existing soil tips located at the north-eastern end of the site.
- The quarry floor and graded slope with access track to the quarry floor) will be grass seeded using a seed mix agreed with the MPA.
- Residual rock faces will be left along the western and southern faces will be graded with soil and seeded to soften the gradient of the lower quarry faces.
- The eastern edge of the quarry will be graded in line with the original profile of the site, with a raised landform between the restored quarry and the existing outer face of the bank which represents the original topography of the eastern facing slope.
- The quarry haul road created during Phase 3 will be retained to enable access for agricultural machinery into the restored quarry.
- The southern slope of the haul road will be appropriately graded and seeded to conform with the graded eastern slope.
- The final extraction phase in the north-western quadrant of the quarry will be restored to a level area at approximately 251m AOD and similar to the southern area side slopes, will be graded to soften the sheer faces of the quarry on the western face.
- The northern end of the quarry will be graded to conform with the original contours of the land to the north, which sweep round into a west to east slope in line with the natural topography of the surrounding land.
- The proposed afteruse of the quarry area and restored grassed slopes will be for agricultural pasture, returning the site to its original use.
- The water treatment area at the southern end of the quarry will be retained as will the existing drainage system. The dividing wall between the two easternmost lagoons along with the liner will be removed and the area left to regenerate naturally as ephemeral wetland. Tree planting around the lagoons is proposed with the species mix to be agreed with the MPA.
- It is anticipated that the two lower areas will remain either wet or seasonally waterlogged and the proposed ephemeral seasonal wetland will cater for that. The woodland/scrub planting will provide bank stability along the slopes around the two lower areas, as well as additional biodiversity value and local landscape character benefits in keeping with the pockets of woodland and treed hedgerows to the south and east of the site. The woodland pockets are shown on the northern slopes to avoid shading the lower ephemeral grasslands.
- The following buildings/structures will remain at the site.

- Farmhouse and Stables.
- Main Production Shed (formerly an agricultural building)
- Storage Shed (former agricultural buildings)

Landscape Plan – Approved 2018

51. The “Approval of Reserved details report, dated June 2018” was submitted along with drawing no. JA-072-001-018.5 – Phase 4 Restoration Design. It describes the 2018 approved concept restoration scheme and landscaping plan for the quarry as follows.
- Exposed rock faces along the eastern, northern and northern half of the western faces of the quarry to provide landscape diversity and ideal nesting for birds.
 - Backfilled, graded and soiled southern slope with access track down to the quarry floor. The slope will be too steep for the use of agricultural machinery but suitable for sheep grazing.
 - The quarry floor will be covered with soils/soil forming material to a depth of up to 0.5m and seeded (seed mix to be agreed with the MPA).
 - The quarry floor will be gently inclined towards the south which may, during winter months and following periods of heavy rainfall, generate an ephemeral wetland.
 - Drawing JA-072-001-018.5 shows several buildings being removed from site, all other buildings will be retained in preparation for the resumption of farming operations.
52. The following were also approved under the 2018 consent.
- Dwg. No. JA-072-001-018.7 Area of Early Restoration
 - Seeding details, dated 16th July 2018
53. Drawing no. JA-072-001-018.7 “Area of Early Restoration” effectively re-produces the Phase 1 plan (drawing no. JA-072-001-018.2) but includes an “Approximate area within which over-tipped material will be removed to original hillside levels/contours and then grass seeded”. This area comprises the waste tip areas along the eastern half and in the south-eastern corner of the quarry which, as outlined in Phase 1, would be subject to re-processing for a temporary period under Condition 7 of the 2018 consent.
54. This drawing was accompanied by a covering letter, which is referred to as “Seeding details, dated 16th July 2018” in the 2018 approved documentation.
55. The letter stated that opportunities for progressive restoration were limited due to a lack of operational space within the quarry. However, it was anticipated that the removal and re-processing of the tipped quarry waste along the eastern side of the quarry would expose original ground level which could be scarified to reduce the effects of any compaction. The scarified areas would be grass seeded using a proposed seed mix EG26 – standard Old Fashioned Grazing Mixture (Emorsgate Seeds) or an equivalent at a rate of 16kg per acre.
56. The aftercare in the first year would comprise light grazing for short periods of time provided that the soil is not saturated. When established with good ground cover and strong roots the sward could be left to graze as normal. Regular grazing would reduce the potential for any significant development of pernicious weeds.

Landscape Plan – Revised 2023

57. As set out above, due to aggregate export limitations the tip has not been entirely removed.

Consequently, it has not been possible to grass seed in the area shown on Dwg. No JA-072-001-018.2.

58. However, early proactive restoration has been undertaken by Artisan at the southern end of the quarry, where the quarry waste tip has been removed, the underlying area has been restored and graded with appropriate soil cover before being grass seeded. The images below illustrate the position in June 2018 and subsequently in July 2022 confirming the positive restoration achieved in this area, outside the extraction area.



June 2018 – Aerial View - Courtesy of Google Earth



July 2022 – Drone Photo looking south – courtesy of DLG Survey

59. The July 2022 image illustrates the restored grassed area between the southern limit of excavation and the lagoon area which was previously overlain by quarry waste tipped material. Furthermore, additional boundary hedgerow planting has been undertaken at the south-eastern

boundary of the property. These restoration works are illustrated in the following photographs.



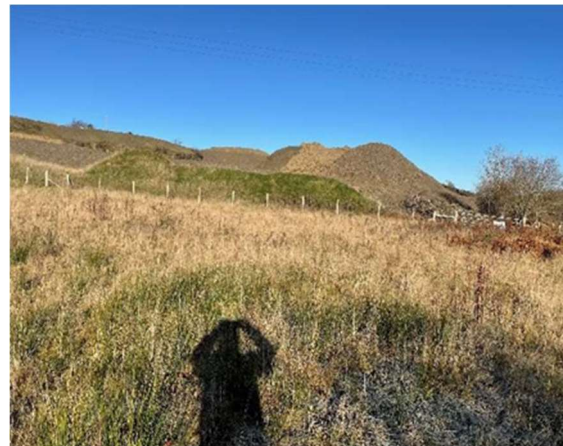
View of southern restored area looking east, from haul road.



View of southern restored area looking west towards stock yard.



Boundary between haul road and restored area at southern end of quarry.



View of grass seeded soil stockpile at southern end of quarry.



Tree planting along south-eastern boundary.



Tree planting along southern boundary (adjacent to lagoons)



Tree planting along western boundary (adjacent to stockyard).



Tree planting along western boundary (adjacent to stockyard)

60. A detailed restoration scheme and associated landscaping and planting proposals will be submitted to the MPA for approval nearer the approved end date for final restoration of the entire quarry, based on the final materials balance.