

Appendix C

**Application for an Environmental Permit
CAMBRIAN QUARRY**

Fugitive Emissions Plans

Mud and Dirt Management Plan

**Reference No. 2304/426/C v1.0 (Dated 18/02/2014)
Section 1**

ASH Resource Management (Cambrian Quarry) Ltd



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Document History:

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Version	Issue date	Status	Notes
1.0	18/02/2014		

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1.0 Introduction

1.1 This section of the management plan sets out the risks posed by mud and dirt arising from the operation of the restoration scheme at Cambrian Quarry and the management measures proposed to prevent monitor and remedy any problems associated with dirt and mud, which arise as a consequence of vehicles leaving the site. The infrastructure and maintenance details are contained in Section 2 of this plan. Failure to implement or have regard to the contents of this or the other management plans associated with the site at any time by an employee of ASH Resource Management (Cambrian Quarry) Ltd or any associated companies will result in disciplinary action in line with standard company procedures. Failure of a contractor to comply with the plan/site rules/or instructions from site staff will lead to a written warning to the individual or their employer any subsequent failure will lead to individuals or contractors being refused entry to the site. Records will be maintained of any management action taken in relation to the MMP within the site log system. The layout of the Mud Management Infrastructure and some of the related drainage infrastructure is shown on the drawing at appendix 1.

Key Staff

- 1.2 The key personnel within the management of the site in relation to the implementation of the mud management plan will be:
- 1.2.1 The site Manager based in the site office with responsibility for inspection and oversight of the whole site and the implementation of the mud management plan. The Site Manager will hold a relevant Certificate of Technical Competence for this type of facility
 - 1.2.2 Wheel-wash supervisors i.e. one operative on duty whenever vehicles are being despatched from the site (plus cover from other company employees).
 - 1.2.3 The supervisors and covering staff will be trained in the routine inspection of the wheel-wash facilities to ensure they are in suitable condition on a day to day basis.
 - 1.2.4 All staff will be trained in inspecting and washing vehicles to ensure no mud remains that could fall from a vehicle. Details of competence training provided and training records are retained in the company's personnel files and will be included within training records in accordance with the written management system.

Review and revision

- 1.3 The plan will be subject to constant review as part of any complaints/investigation procedure in response to incidents or failures falling outside normal operating conditions. The plan will also be subject to a regular audit by the site manager, commencing then being once or twice a year thereafter unless a more frequent audit is considered necessary.

Interaction with other management plans and the Written Management System

- 1.4 This plan is written to complement and combine with the other management systems and plans which will be put in place for this site these include the Written Management System, the Surface Water Drainage Plan, The Dust Management Plan and a number of others which will interface with this plan and will be available prior to import of wastes. There may be a number of amendments particularly in the development stages of the site. Some aspects of the surface drainage plan mentioned in this plan may be subject to changes once the fully integrated surface drainage plan has been developed.

2.0 Site Description

- 2.1 Cambrian Quarry is an inactive limestone and silica stone quarry in Gwernymynydd, 2.5km south west of Mold. The quarry covers a total area of 7.3 hectares, Cambrian Quarry void covers approximately 2.8 hectares. This application involves the importation of inert materials for use in the restoration of the quarry in order to make the quarry faces stable and safe. The restoration will result in the formation of a shallow valley landform which will subsequently be used for agriculture and nature conservation once restored. It also proposed that an inert waste recycling operation will be undertaken within the quarry which would export material off site for re-use and the residues from the recycling process that cannot be re-used may be used in the restoration of the quarry. The void space is estimated to be around 477,000m³ and take around 10 years to complete. The quarry void would be restored progressively in five phases, with the first four phases required to create a stable landform which would stabilise the unstable quarry faces. It is anticipated that between 145,000 and 200,000 tonnes/annum could be transported into Cambrian Quarry and between 45,000 and 60,000 tonnes of this material would be recycled for export. Leaving 70% of the imported material used in the restoration of the site. Materials would be transported using heavy goods vehicles with an average load of 20 tonnes. The average number of HGV loads transported to the quarry per day is expected to be between 28 and 38 (equating to 56 and 76 HGV movements per day).

3.0 Identified Risks

- 3.1 The primary risk is the tracking of mud and dirt by vehicles leaving the site.
- 3.2 There is a secondary risk of mud and dirt washing from the site roads and the site under conditions of extreme rainfall. Calculations for drainage etc. are based on the data gathered for the ESID Report (Appendix F).

4.0 Normal Operating Conditions

- 4.1 All vehicles that have visited the operational area of the site or that are judged to be carrying dirt must leave via the exit road and have their wheels, wheel arches and under body area cleaned before leaving the site. The wash will be supervised by a trained operative who will ensure the lorry remains on the wash for sufficient time to remove adhering mud. When the lorry leaves the wash the wheel-wash supervisor will check the vehicle a second time and if there appears to be a substantial amount of mud still adhering to the vehicle it will be directed to re-use the wash.

- 4.2 The lorry will only be permitted to proceed to the site entrance when judged to be clean and given permission by the wheel wash supervisor. The site road between the wheel wash and the site exit must also be clean and free of mud or debris before a vehicle is permitted to proceed.
- 4.3 Further operative(s) in addition to the wheel cleaning supervisors will maintain the site exit road in a clean condition using manual and mechanical sweepers and washing as necessary.
- 4.4 Drivers failing to obey instructions from the wheel-wash supervisors will face disciplinary action if employed by the operator and if working for a contractor will be ultimately banned from visiting the site after a suitable written warning. The introduction provides a more detailed explanation of the procedures in place. Clearly any disciplinary action against employees will have to be governed by employment law.

5.0 Abnormal Conditions

- 5.1 Abnormal conditions are defined as occasions when any of the following circumstances occur:

- there is an unusual amount of mud adhering to vehicles;
- inclement weather;
- part of wheel wash equipment is not operational;
- insufficient staff are present to implement the Mud Management Plan as described;
- mud is detected on the site road below the wheel wash;
- mud is detected on the highway;

In these circumstances the site manager will assess if it is possible to prevent mud adhering to vehicles leaving the site. If this is considered impracticable the site will be closed.

- 5.2 In most situations when there are abnormal conditions, delivery of waste to the site will cease until conditions improve. There may be scenarios where closure is not required for example delivery of dry material in dry weather delivery of clean hardcore delivery of oversize inert items large pieces of concrete or similar where there is no risk of picking up mud and the equipment and personnel available can ensure there is no mud adhering to vehicles. Conditions may also be improved through any of the following scenarios:
- improving weather;
 - repair/replacement of faulty equipment;
 - deployment of additional equipment/trained staff;
 - other site works such as providing temporary turning/tipping pad of hard core to minimise the picking up of mud on delivery vehicles.
- 5.3 If ice and snow are present in quantities that prevent the safe operation of the site or the satisfactory implementation of the mud management systems the site will be closed for the delivery of waste. Works may be undertaken to clear access roads of ice and snow if access is required. It is considered that unless such conditions are expected to persist for

a considerable time and operations on site can be managed without compromising safety or mud management the site will remain closed until weather conditions improve.

6.0 Monitoring and Reporting

- 6.1 Whenever the site is accepting deliveries of waste the site manager and/or the wheel-wash supervisor will check the exit site road, site entrance and the public highway for signs that mud and dirt are being tracked from the working area.
- 6.2 Checks will be made on arrival at the site at least three times each day when vehicles are exiting from the site and at the end of the day, checks will be recorded in the site diary/inspection record (attached as Appendix 2). If any mud is detected in these areas the action plan outlined below will be instigated or the abnormal conditions actions will be put in place.

7.0 Action Plan

- 7.1 If mud or dirt is found to be on the exit road immediate steps will be taken to inspect the full length of the exit road and the highway outside the site.
- 7.2 Any areas of the exit road where mud is found will be cleaned immediately using manual and mechanical sweeping and shovelling.
- 7.3 If mud has been tracked onto the highway immediate steps will be taken to deploy the road-sweeper to clean the highway.
- 7.4 No more vehicles will leave the site until the exit road/site entrance, and if necessary, the highway have been cleaned and swept.

8.0 Investigations and Complaints

- 8.1 If monitoring of the highway reveals a problem or there are complaints from third parties reported to the site, the site manager will conduct an immediate investigation into the cause of the failure/complaint. Investigations will be carried out in accordance with the complaint and investigation procedure (attached as Appendix 3). A note will also be made in the site diary indicating that an investigation has been conducted/complaint received and the action taken.

9.0 Other Measures

9.1 Instructions will be provided to the drivers of all vehicles delivering waste to the site, which will include:

- the exit route
- the requirement to use the wheel-wash;
- how to use the wheel-wash;
- the requirement to obey instructions from the wash supervisors; and
- details of the sanctions for failure to comply.

9.2 If any drivers or sub-contractors fail to follow these instructions they will be prevented from using the site. The instructions will also ask that drivers report any incidents where mud is noted on the highway, or noticed to be originating from other vehicles not visiting the quarry site.

10.0 Proposed Site Completion Arrangements

10.1 The exit road and wheel wash will be sited at a level equivalent to the agreed final contours. This means that the wheel washing equipment and site exit roads can remain in-situ until the site is fully restored. The road ways can remain as access tracks for the site when it is restored to agricultural or recreational use or can be easily removed without causing a risk of contaminating the highway. The wheel wash equipment is demountable and therefore can be removed with a minimum of fuss using lorry mounted cranes.

Appendix 1

Draft Site layout plan with parts of the proposed drainage layout

Appendix 2

Draft Site Check Sheet

Appendix 3

Complaints/Investigation procedures.

ASH Resource Management (Cambrian Quarry) Ltd Investigations and Complaints Report Form

Date Recorded	Reference Number
Name and address of complainant*	
Person Noting Breach of Permit Conditions*	
Telephone number of caller	
Time and Date of call	
Nature of breach/complaint (mud on highway, mud on site road, noise, odour, dust, other) (date, time, duration, action taken, time to rectify.)	
Weather at the time of complaint (rain, snow, fog, etc.)	
Wind (strength, direction)	
Any other complaints/breaches relating to this report	
Any other relevant information	
Potential reasons for complaint	
The operations being carried out on site at the time of the complaint	
Follow Up	
Actions taken, including any reports made to Site Owner, EA or Local Authority	
Date of call back to complainant	
Summary of call back conversation	
Recommendations	
Change in procedures	
Changes to Management Systems	
Date changes implemented	
Form completed by	Changes to Management Plans authorised by
Signed	Signed
Date completed	Date agreed

Complaint recording procedure.

- 1) Any investigations carried out or third party complaints received will be recorded on the form below. This form will normally be completed, signed and dated by the Site Manager, if they are not available the Office Manager or a company director will complete the form.
- 2) a) For third party complaints the name, address and telephone number of the caller will be requested.
b) Where a staff member has noted a breach of a permit condition their name will be recorded
- 3) Each investigation/complaint will be given a reference number.
- 4) a) A third party caller will be asked to give details of:
 - the nature of the complaint;
 - the time;
 - how long it lasted;
 - how often it occurs;
 - is this the first time the problem has been noticed; and
 - what prompted them to complainb) For a breach of condition the following details will be recorded
 - the nature of the breach;
 - the time;
 - how long it lasted;
 - action taken to rectify the situation;
 - how quickly compliance was achieved; and
 - is this the first time the problem has been noted;
- 5) The person completing the form will then, if possible, make a note of :
 - the weather conditions at the time of the problem (rain snow fog etc.)
 - strength and direction of the wind; and
 - the activity on the site at the time the breach/complaint was detected, particularly anything unusual.
- 6) The reason for any breach or complaint will be investigated and a note of the findings added to the report along with any reports made to the EA or Barrow BC.
- 7) Following complaints the caller will then be contacted with an explanation of the source of the complaint if identified and the action taken to prevent a recurrence of the problem in future.
- 8) If the complainant is unhappy about the outcome or unwilling to identify themselves the caller will be referred to the appropriate department of the Environment Agency or Barrow Borough Council.
- 9) Following any investigation/complaint the relevant management plan(s) will be reviewed to ensure appropriate actions are in place to counter any problems.

**Application for an Environmental Permit
Cambrian Quarry**

Fugitive Emissions Plans

Dust Management Plan

Section 1

Reference No. 2304/426/C (Dated 18/02/2014)

ASH Resource Management (Cambrian Quarry) Ltd



Oaktree Environmental Ltd

Dust Management plan

Cambrian Quarry

This plan has been prepared as part of the Environmental Permit application, because there are sensitive receptors within 100 metres of the nearest quarry face. The type of dust generated will be predominantly of soil origin and will not contain significant quantities of fine particulates consequently visual monitoring is considered appropriate unless experience on site proves otherwise.

The following table sets out:-

- The likely sources of dust arising from the site.
- The procedures followed or planned at the site in order to prevent or minimise levels.

Dust source/problem	Action to be taken to prevent or minimise dust	Completion Date
Vehicles travelling to and from the highway to the tipping and processing area.	• Site roads kept damp and swept in potentially dusty conditions. • Speed limit for dusty conditions set at 5 miles per hour • No unnecessary running or revving of vehicles • No delivery of potentially dusty wastes	Opening of site
On site plant	• No unnecessary running on areas likely to generate dust • Speed restricted to prevent dust generation • Dust suppression	Opening of site
Levelling of waste	• If levelling operation generating an excess of dust level only minimal amount required to allow safe tipping area • Damp down working area	Opening of site
Wind blown dust roads and surfaced areas	• Ensure all surfaced areas kept clean and tidy • Damp down surfaced areas	Opening of site
Wind blown dust non working areas.	• Damp down all accessible areas • Ensure nonworking areas are left with a rough surface to prevent wind pick up of dust • Ensure no dusty wastes are left at the surface of wind blown areas	Opening of site
Extreme conditions	• Cease all operations on site • Deploy bowser for continuous damping of site	Opening of site
Persistent escape of dust	• Deployment of fixed dust suppression equipment	If assessed as necessary

Complaints

ASH Resource Management (Cambrian Quarry) Ltd will fully investigate any complaints received about the site, the complaints form and procedure can be seen on the next two pages.

ASH Resource Management (Cambrian Quarry) Ltd

Dust Complaints Report Form

Date Recorded	Reference Number
Name and address of caller	
Telephone number of caller	
Time and Date of call	
Nature of complaint (blowing dust settled dust) (date, time, duration)	
Weather at the time of complaint (rain, snow, fog, etc.)	
Wind (strength, direction)	
Any other complaints relating to this report	
Any other relevant information	
Potential reasons for complaint	
The operations being carried out on site at the time of the complaint	
Follow Up	
Actions taken	
Date of call back to complainant	
Summary of call back conversation	
Recommendations	
Change in procedures	
Changes to Written Management System	
Date changes implemented	
Form completed by	
Signed	
Date completed	

Dust complaint recording procedure.

- 1) Any dust complaints received will be recorded on the form above. This form will normally be completed, signed and dated by the Site Manager, if he is not available the administrator will complete the form.
- 2) The name, address and telephone number of the caller will be requested.
- 3) Each complaint will be given a reference number.
- 4) The caller will be asked to give details of:
 - the time the dust was detected;
 - how often it occurs;
 - the nature of the dust – what sort of dust visible in the air coating surfaces affecting washing?
- 5) The person completing the form will then, if possible, make a note of :
 - the weather conditions at the time the dust was detected – usually wind direction and a note of the conditions (light wind, no wind, strong breeze, clear, full cloud cover etc.);
 - the activity on the installation at the time the dust was detected, particularly anything unusual.
- 6) The reason for the complaint will be investigated and a note of the findings added to the log.
- 7) The caller will then be contacted with an explanation of the source of the dust if identified and the action taken to minimise the dust in future and mitigate any problems.
- 8) If the caller is unhappy about the outcome or unwilling to identify themselves the caller will be referred to the appropriate department of Flintshire County Council on Tel 01352 752121.

Following any noise complaint the Dust Management Plan, will be reviewed to see if any changes to existing procedures are required or if new procedures need to be put in place.

**Planning Application for the Restoration of
Cambrian Quarry by the Importation and
Recycling of Inert Materials**

Dust Impact Assessment

Version 1.2

Document ref.
2535-426-A

ASH Resources (Cambrian Quarry) Ltd



Oaktree Environmental Ltd

Document History:

Version	Issue date	Status	Written by	Reviewed by
1.1	20 August 2012	Internal draft issued for client comment	DY	
1.2	5 October 2012	Final	DY	

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1 Introduction

1.1 Scope of Work

1.1.1 A Dust Impact Assessment (DIA) has been undertaken in support of a planning application being submitted for the proposed restoration of Cambrian Quarry, Gwernymynydd, Mold, Flintshire. The assessment has been undertaken to predict the potential air quality impacts on the surrounding environment as a result of dust emissions associated with the processes proposed on site. The content of this assessment has been scoped and agreed with the Environmental Health Officer (EHO) at Flintshire County Council (FCC)¹.

1.2 Site Location

1.2.1 Cambrian Quarry is located approximately 2.5km South-West of Mold and 300 metres to the South of Gwernymynydd at approximate National Grid Reference (NGR) 321450, 362150 and is bounded and defined as follows:

- Open ground to the East with residential properties and Glyndwr Road to the East;
- Open ground to the South;
- Open ground to the West with woodland beyond; and,
- Woodland to the North with Glyndwr Road and the A494 beyond.

1.2.2 Minerals extraction was undertaken at Cambrian Quarry as far back as the early 1800,s which included quarrying, underground lead and silica mining. Quarrying activities were undertaken at the site until the year 2000. A skip hire business has operated within the Old Quarry Area since 1980. Part of the quarry has planning consent for waste disposal. Most of the quarry and immediate surroundings comprise woodland and scrubland/calcareous grassland that have regenerated on the old workings and mineral tip areas. Cambrian Quarry forms part of a wider Site of Special Scientific Interest

¹ Email communications from Dave Jones, EHO at Flintshire County Council, dated 30 July 2012 and 6 August 2012

(SSSI), Cambrian Quarry SSSI, which is designated due to a hibernating/winter population of lesser horseshoe bats. Additionally, the SSSI has other features including open habitats, open water, grassland, scrub, broadleaved and mixed woodland and conifer plantations.

1.3 Development Proposals

- 1.3.1 Reference should be made to Drawing No. ASH/CQ/05 at the start of the Environmental Statement for the site boundary and a plan showing development proposals.
- 1.3.2 The proposals are for the restoration of the Cambrian Quarry Void. This will include the direct importation of pre-selected, inert restoration materials and importation of inert wastes which will be crushed, screened and re-used as aggregate or topsoil. Residues from the recycling process that cannot be re-used, which will be mainly clay and subsoil, will be used in the restoration of the quarry. Aggregates and topsoil produced from the recycling operations will be exported from site for re-use. The recycling operation ensures that all useable aggregate and soil materials brought in to the site are re-processed and re-used.
- 1.3.3 It is anticipated that the total quantity of material to be transported into Cambrian Quarry will be between 145,000 and 200,000 tonnes/annum. Between 45,000 tonnes and 60,000 tonnes of this material will be recycled and exported as aggregate and topsoil. Materials will be transported using Heavy Goods Vehicle (HGVs) with an average payload of 20 tonnes. It is understood that the average number of HGV loads transported to the quarry per day will range between 26 and 36, which equates to between 52 and 72 HGV movements. All recycled materials would be exported on a 'return load' basis so there would be no additional HGV movements as a result of transporting recycled products off site. There may be some variation in the number of loads/movements, but these will not exceed 75 loads/150 movements per day.
- 1.3.4 It is anticipated that the maximum timescale for the proposed restoration operations will be 10 years.

- 1.3.5 The operations at the quarry will have potential to create airborne dust emissions. Potential impacts arising as a result of dust emission have been assessed within this report.

1.4 Potential Sources of Dust Emission

- 1.4.1 The following identifies the potential source of dust emissions from the site:

- Unloading/loading of raw materials/aggregates;
- Storage of raw materials and aggregates;
- Crushing and screening of materials;
- Infilling operations; and,
- Haulage of materials to and from site.

- 1.4.2 Fugitive emissions of dust may occur when particles are disturbed and raised by activities undertaken on site. Furthermore, dust can be disturbed and raised by wind and wind speeds in excess of 11 knots (5.7m.s^{-1}) can lead to fugitive dust being transported some distance from a source. The distance that the dust will travel once airborne will depend on a number of factors, including size of particles, wind speed and rainfall and local topography. Potential dust emissions from the proposed operations may comprise finer particles which is defined as particulate matter $<10\mu\text{m}$ in aerodynamic diameter (PM_{10}) and coarser particles ($>10\mu\text{m}$ in diameter), sometimes referred to as nuisance dust. Particles $>30\mu\text{m}$ in diameter will largely deposit within 100m of a source, whilst intermediate sized particles ($10\text{-}30\mu\text{m}$) may travel up to 500m from a source. Finer particulate matter (PM_{10}), which would be expected to make up the smallest portion of particulate emissions from the proposed activities, will be deposited more slowly and may travel up to 1,000m from a source.

- 1.4.3 The activities associated with the recycling operations, including crushing and screening, storage of raw materials, aggregates and infilling will be undertaken with the quarry void, at various locations within the void as infilling progresses. As such, many of processes which have potential to create dust emission will be sheltered from the wind, which will provide natural mitigation to creation of wind blown dust emission. This is discussed in more detail later within this assessment.

2 Relevant Legislation and Guidance

2.1 Documents Consulted

2.1.1 The following documents have been consulted during the completion of this DIA:

- The Air Quality Standards (Wales) Regulations 2010
- The Environmental Permitting (England and Wales) Regulations 2010;
- Local Air Quality Management Technical Guidance (09) (LAQM.TG(09)), Department for Environment, Food and Rural Affairs (DEFRA), 2009;
- Development Control: Planning for Air Quality (2010 Update), Environmental Protection UK, 2010.
- Design Manual for Roads and Bridges, Volume 11, Section 3 Part 1- Air Quality, Highways Agency, 2007;
- Minerals Technical Advice Note (MTAN) 1: Aggregates, Welsh Assembly Government, 2004; and,
- The Environmental Effects of Dust from Surface Mineral Workings, Department of the Environment, 1995.

2.2 Definition of Dust

2.2.1 Dust is a generic term used to describe particles ranging in size from 1µm to 75µm. Potential emissions of dust considered within this DIA fall under two broad categories as follows:

- PM₁₀; and,
- Nuisance dust.

2.2.2 PM₁₀ defines particles fine enough to enter the lungs upon inhalation and can impact upon human health and overtime can lead to carcinogenic effects. As outlined previously, PM₁₀ can travel up to 1km from a source. Nuisance dust includes coarser particulate matter >10µm in diameter, which as outlined above, will have the potential to travel varied distances from a source, dependent on particle size. Although such

dust has the potential to cause short and long term chronic health impacts, this is defined as nuisance dust since if the rate of soiling (deposition) becomes rapid enough, it may lead to nuisance complaints. The Local Authority is obliged, where statutory complaint about dust is made, to take steps to investigate in accordance with Part III of the Environmental Protection Act (1990). Where assessment of dust impacts is made within this assessment, consideration has been given to potential to cause statutory nuisance.

2.3 Health Based Air Quality Standards, Limits and Objectives

- 2.3.1 The European Union (EU) established an Air Quality Assessment and Management Framework in 1996, Directive 96/62/EC. This identified twelve pollutants for which limit values would subsequently be set, including particulate matter. These limits were outlined within four subsequent ‘daughter’ directives. Directives 99/30/EC, 2000/69/EC and 2004/107/EC defined ambient air limit values for the twelve pollutants, including particulate matter.
- 2.3.2 Within the United Kingdom (UK), Air Quality Standards (AQS) for ambient air were outlined within The Air Quality Standards Regulations 2007, which came into force on 15 February 2007. These regulations transposed Air Quality Limit Values (AQLVs) from the four EU daughter Directives into UK legislation, and outlined dates by which limit values must be achieved, in line with EU obligations. In the UK, the Air Quality Strategy is used to implement Air Quality Objectives (AQOs) and also for providing a framework for improving air quality.
- 2.3.3 EU Directive 2008/50/EC on ‘ambient air quality and cleaner air for Europe’ came into force on 21st May 2008. This directive aimed to simplify existing EU air quality legislation through consolidating previous directives into one single directive. The provisions of this directive were required to be transposed into member states’ legislation by 10th June 2010. Within Wales, this legislation was transposed within the Air Quality Standards (Wales) Regulations 2010 on 11 June 2010, at which point the Air Quality Standards Regulations 2007 were revoked.

2.3.4 Table 1 outlines the AQLVs for PM₁₀, which are relevant to this assessment. These have been obtained from the Air Quality Standards (Wales) Regulations 2010.

Table 1 Air Quality Limit Values

Pollutant	Measured As	Purpose	UK Air Quality Limit Values
PM ₁₀	24-hour mean	Protection of human health	50µg.m ⁻³ (not to be exceeded more than 35 times per calendar year)
	Annual mean	Protection of human health	40µg.m ⁻³

2.4 Standards for Deposited/Nuisance Dust

2.4.1 There are no UK or European standards for deposited dust. However, in the UK, a dust deposition rate of 200mg.m⁻².day⁻¹ is generally used as the threshold above which complaints are possible. Literature suggests that significant impacts on vegetation are not likely to occur at deposition rates of less than 1000mg.m⁻².day⁻¹.²

2.5 Environmental Permitting

2.5.1 The proposed recycling operations at the quarry will be covered by an Environmental Permit (EP), and regulated by the Environment Agency (EA). The EP will contain conditions governing site operation with the aim to prevent any impacts on air quality. Many of the dust mitigation measures included later within this assessment will be included within the Written Management System (WMS) for the site, which is required as one of the conditions to operate under the EP.

²

Interim Advice Note 61/05 – Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs (Supplement to DMRB 11.3.1).

3 Assessment Methodology

3.1 Overview of Assessment Methodology

3.1.1 The scope of this DIA has been scoped and agreed with the EHO at FCC and includes the following:

- Qualitative evaluation of current baseline dust/PM₁₀ levels at the site through a review of available data including Local Air Quality Management Reports, DEFRA mapped background pollutant concentration data for PM₁₀ and data in available literature for typical background dust deposition;
- Identification of receptors sensitive to dust surrounding the site;
- An assessment of local meteorological conditions using wind speed and direction and rainfall data from 10 years of data reported at Hawarden, which is located approximately 13km to the East of the site;
- Identification of the potential sources of dust and PM₁₀ emission, qualitative assessment of potential dust/PM₁₀ impacts and identification of appropriate mitigation measures, as appropriate; and,
- Identification of any residual impacts, with mitigation measures in place.

3.2 Methodology Used for Assessing Fugitive/Wind Blown Dust Impacts

3.2.1 The estimation of potential fugitive, wind blown dust impacts is subjective. The risk of adverse impacts can be evaluated by combining the magnitude of a potential impact with the probability of the impact occurring, which is assessed using professional judgement. For example, the magnitude of any dust impact will depend on the proximity of a receptor to the site and the presence of any intervening trees and vegetation which will act to intercept fugitive dust. However, the probability that a dust impact event will occur in the first place will be heavily governed by wind direction and speed. Matrices have been used to determine potential magnitude and probability of a dust impact, which is based upon common methodology used in the field. The matrices used are presented below.

Table 2 Matrix Used to Predict Overall Risk of Dust Impact

	Magnitude			
	Severe	Moderate	Mild	Negligible
Probability				
High	High	High	Medium/Low	Near Zero
Medium	High	Medium	Low	Near Zero
Low	High/Medium	Medium/Low	Low	Near Zero
Negligible	High/Medium/Low	Medium/Low	Low	Near Zero

Table 3 Criteria Used to Evaluate Probability of Dust Impact

Probability	Criteria (Frequency of Wind Directions Orientated Towards Receptor/Wind Speeds > 5.7 m.s ⁻¹) ^(a)
High	>20%
Medium	11-19%
Low	3-10%
Negligible	<3%

N.B (a) Where different frequency bands occur for wind direction and wind speed, the highest of the two is used to ensure a conservative, worst case assessment.

Table 4 Criteria Used to Evaluate Overall Magnitude of Dust Impact

Distance Between Source and Receptor				
	0-50m	50 -100m	100-250m	>250m
Level of Natural Screening (Trees/hedges)				
None	Severe	Moderate	Mild	Negligible
Partial	Moderate	Mild	Negligible	Negligible
Full	Mild	Negligible	Negligible	Negligible

3.3 Methodology Used for Assessing Potential Impacts from PM₁₀

- 3.3.1 In England, previous guidance on minerals activities provided a framework for assessment of potential PM₁₀ impacts in the form of a flow chart, which is an amended version of a framework produced by a previous COMEAP publication entitled “Do particulates from opencast coal mining impair children’s respiratory health?” The framework advises that if there are no residential properties within 1,000m of a process, or if PM₁₀ emissions are unlikely to exceed Air Quality Objectives, that good practice measures will be sufficient. It is difficult to evaluate the level of PM₁₀ emissions that will occur from operations such as those proposed. However, judgment has been made, based upon data presented in the literature.

4 Baseline Conditions

4.1 Existing Air Quality

4.1.1 Background PM₁₀

4.1.1.1 FCC are required to undertake a review and assessment of air quality within their area of jurisdiction under Section 82 of part IV of the Environment Act (1995). Local Authorities (LAs) are obligated to undertake an Updating and Screening Assessment (USA) of local air quality every three years. For areas where AQLVs are not expected to be achieved, the LA is obligated to undertake detailed assessment, involving modelling of pollutant emissions. Subsequently, if AQLVs are not predicted to be met, the LA must declare an Air Quality Management Area (AQMA).

4.1.1.2 There are no AQMAs declared in Flintshire at present.

4.1.1.3 The latest available air quality report is the 2010 USA. No monitoring of PM₁₀ is undertaken in the vicinity of Cambrian Quarry. Therefore, DEFRA background mapping data has been used to determine current baseline PM₁₀ concentrations.

4.1.1.4 The UK National Air Quality Archive contains background pollutant mapping data for PM₁₀ on a 1km by 1km grid square basis across the UK. This data is routinely used for assessing background pollutant concentrations where no suitably representative air pollution monitoring data exists. The archive is maintained by AEA on behalf of DEFRA. PM₁₀ data is available for each grid square for the years 2008 to 2020.

4.1.1.5 Table 5 contains estimated background concentrations for PM₁₀ for the grid square 321500, 362500 which is the square containing Cambrian Quarry. Concentrations have been presented for base year 2012.

Table 5 Background Pollutant Mapping Data for Grid Square 321500, 362500

Pollutant	2012 Annual Mean Background Concentration ($\mu\text{g.m}^{-3}$)
PM ₁₀	11.72

4.1.2 Background Deposited Dust

- 4.1.2.1 Various values for ambient dust deposition rates in the UK are provided in literature. Background levels of dust deposition will vary depending on the local setting. It is reported elsewhere that typically, dust deposition rates may range from 10 to 50mg.m².day⁻¹ in rural areas, 30-80mg.m².day⁻¹ in suburban areas and 80 to 160mg.m².day⁻¹ in town centre/industrial areas³. The setting of Cambrian Quarry is predominantly rural. Therefore, as a worst case, the higher end of the typical rural dust deposition figures (50mg.m².day⁻¹) has been determined appropriate as a current background dust deposition rate at Cambrian Quarry.

4.2 Meteorological Conditions

- 4.2.1 The potential for dust deposition arising from the proposed activities at surrounding sensitive receptors will be highest during drier, windier conditions when wind direction is orientated from the site operations toward the receptor concerned. Section 3.2 and 3.3 outlined the criteria used to assess potential risk of dust impacts at receptor locations.
- 4.2.2 Meteorological data used within this assessment has been obtained from Hawarden, which is located approximately 13km to the East of the proposed site. Data was provided by ADM Ltd, an established distributor of meteorological data within the UK. Ten years of hourly wind speed and direction data and rainfall data observed between 2003 and 2012 at Hawarden has been used in this assessment. The choice of meteorological data to use was scoped and agreed with the EHO at FCC. Table 6 summarises average wind direction frequency. The data shows that the predominant

³ Harley Way Quarry Dust Assessment for Churchfield Stone Ltd, Alex Grant AirQ, December 2011.

wind directions are between South-East and North-West, with much lower frequency of winds orientating from between North and East

Table 6 Wind Direction Frequency at Hawarden (2003-2012)

Wind Direction (Degrees)	Direction Frequency (%)
Calms	14.3
North (340°-20°)	4.5
North-East (30°-60°)	2.3
East (70°-110°)	3.3
South-East (120°-150°)	14.1
South (160°-200°)	17.3
South-West (210°-240°)	12.3
West (250°-290°)	15.6
North-West (300°-330°)	16.3

4.2.3 The land descriptors within the Beaufort Wind Scale indicate that dust is raised at wind speeds in excess of 11 knots. 11 knots equates to 5.7m.s^{-1} . Therefore, the meteorological data has also been analysed to determine the percentage occurrence of wind speeds exceeding 5.7m.s^{-1} for each directional sector, which is presented in the following table.

Table 7 Percentage Occurrence of Wind Speeds $>5.7\text{m.s}^{-1}$

Wind Direction	Wind Speeds $\geq 5.7\text{m.s}^{-1}$ (Percentage Occurrence (2002 -2011))
North	0.46
North-East	0.31
East	0.57
South-East	2.64
South	3.34
South-West	4.83
West	5.32
North-West	3.84

- 4.2.4 Dry days are defined as days with <0.2mm of rain falling. Analysis of the data from Hawarden shows an average of 188 dry days per year. Proportioning this to the worst case number of working days per year (5.5), gives 148 dry working days per year. When this is combined with the wind direction data above, the following table illustrates the likely the likely number of dry days occurring for each wind sector.

Table 8 Number of Dry Working Days Per Year

Wind Direction	No. of Dry Working Days	Percentage of Working Year (%)
Calms	26.8	9.37
North	8.5	2.97
North-East	4.3	1.50
East	6.3	2.2
South-East	26.5	9.27
South	32.5	11.36
South-West	23.1	8.08
West	29.3	10.24
North-West	30.7	10.73

4.3 Sensitive Receptors

- 4.3.1 Sensitive receptors in the vicinity of the site have been identified in the table below. Reference should be made to Appendix 1 Figure 1 for a graphical representation of receptor locations. The table summarises the proximity of the receptors to the proposed recycling and infilling operations and the haul road.

Table 9 Dust Sensitive Receptors

Receptor Identifier	Description	NGR (m)		Approximate Distance from Recycling and Infilling Operations (m)	Approximate Distance from Internal Haul Road (m)
		X	Y		
D1	Residential property on Glyndwr Road	321586	361954	110	275
D2	Residential property on Glyndwr Road	321588	361983	115	250
D3	Tudor Cottage	321593	362019	105	230
D4	Residential property on Glyndwr Road	321606	362085	100	210
D5	Residential property on Glyndwr Road	321609	362114	95	190
D6	Residential property on Glyndwr Road	321635	362144	125	165
D7	Residential property on Glyndwr Road	321674	362177	158	170
D8	Residential properties on A494	321592	362422	220	75
D9	Residential properties on Paddock Way	321682	362413	300	150
D10	Residential property on A494	321461	362379	210	80
D11	Residential properties on A494	321431	362411	255	125
D12	Residential property at Junction of Llys Enfys/A494	321291	362383	260	155
D13	Residential properties on Llys Enfys	321240	362365	280	175
D14	Residential property on Glyndwr Road	321620	361783	190	400

Receptor Identifier	Description	NGR (m)		Approximate Distance from Recycling and Infilling Operations (m)	Approximate Distance from Internal Haul Road (m)
		X	Y		
D15	Residential property	320958	362090	480	410
D16	Residential property on Bryn Ethin	321163	362331	315	210
D17	Bryngwyn Farm	321332	361311	570	900
D18	Residential property on Glyndwr Road	321659	361629	345	610
D19	Cambrian Quarry SSSI	-	-	N/A - adjacent	N/A - adjacent
D20	The Old Chapel	321465	362371	140	10

5 Assessment of Potential Dust Impacts

5.1 Nuisance Dust

5.1.1 Potential Unmitigated Dust Impacts at Human Receptors

- 5.1.1.1 Winds flow from the West for 15.6% of the year, and are likely to exceed 5.7m.s^{-1} for 5.32% of the year from this direction. Westerly winds are relevant to receptors D1 to D7 which lie to the East of the Site. The magnitude of any impacts is considered to be mild at receptors D1 to D4 and D6 to D7, and moderate at receptor D5. The probability of unmitigated dust impact is medium at receptors D1 to D7. The overall risk of unmitigated dust impact is therefore predicted to be low at receptors D1 to D4 and D6 to D7, and medium at receptor D5, in accordance with the assessment methodology.
- 5.1.1.2 Winds flow from the North-West 16.3% of the year and are likely to exceed 5.7m.s^{-1} for 3.84% of the year from this direction. North-Westerly winds are relevant to receptors D14 and D18 which are 190m and 345m from the site respectively. The magnitude of any impacts at these receptors is predicted be mild and negligible at receptors D14 and D18 respectively. The probability of dust impact occurrence is medium, with the overall risk of unmitigated dust impact therefore predicted to be low at receptor D14 and near zero at receptor D18.
- 5.1.1.3 Winds flow from the North for 4.5% of the year and are likely to exceed 5.7m.s^{-1} for 0.46% of the year from this direction. Northerly winds are relevant to receptor D17, which is located 570m from the site. The magnitude of any impacts at this distance is considered to be negligible, and the probability for such occurrences is considered to be low. The overall risk of unmitigated dust impact therefore predicted to be near zero at receptor D17.
- 5.1.1.4 Winds flow from the East for 3.3% of the year and are likely to exceed 5.7m.s^{-1} for 0.57% of the year from this direction. Easterly winds are relevant to receptor D15, which is 410m from the site. The magnitude of any dust impacts at this receptor is predicted to be negligible, and the probability of dust impact is low, with the overall risk of unmitigated dust impact predicted to be near zero at receptor D15.

- 5.1.1.5 Winds flow from the South-East for 14.1% of the year and are likely to exceed 5.7m.s^{-1} for 2.64% of the year from this direction. South-Easterly winds are relevant to receptors D12, D13 and D16 which are located at least 150m from the internal haul road and at least 260m from the infilling/recycling operations. The probability of a dust impact is considered to be medium at these receptors, with the magnitude of any impacts predicted to be negligible due to dense natural screening provided by woodland. The overall risk of unmitigated dust impact is therefore predicted to be near zero at receptors D12, D13 and D16.
- 5.1.1.6 Winds flow from the South for 17.3% of the year and are likely to exceed 5.7m.s^{-1} for 3.34% of the year from this direction. Southerly winds are relevant to receptors D11, D10 and D20. Receptors D11 and D10 are located at least 80m from the internal haul road and at least 210m from the infilling/recycling operations. The magnitude of any dust impacts at these receptors is considered to be negligible due to natural screening provided by woodland and the probability of impact occurrence considered to be medium. The overall risk of unmitigated dust impact is predicted to be near zero at receptors D11 and D10. Receptor D20 will be located approximately 10m from the entrance of the internal haul road, but with the exception of the point at which the HGVs enter the main road, this receptor will be screened by vegetation from the site. Therefore, the magnitude of any dust impacts is predicted to be mild and the probability of impact occurrence considered to be medium at receptor D20. The overall risk of unmitigated dust impact is predicted to be low at receptor D20.
- 5.1.1.7 Winds flow from the South-West for 12.3% of the year and are likely to exceed 5.7m.s^{-1} for 4.83% of the year from this direction. South-Westerly winds are relevant to receptors D8 and D9 which are located at least 75m from the internal haul road and at least 220m from the infilling/recycling operations. The magnitude of any impacts at these receptors is be considered to be mild due to partial screening provided by vegetation, and the probability of dust impact occurrence is medium, with the overall risk of dust impact predicted to be low at receptors D8 and D9.

5.1.2 Potential Dust Impacts at Ecological Receptors

- 5.1.2.1 Dust may directly impact on plants through physically smothering leaves. If the level of dust deposition is high enough, it can lead to adverse impacts upon photosynthesis, respiration and transpiration. It has been reported in literature that most sensitive vegetation species are affected by dust deposition levels in excess of $1,000\text{mg.m}^{-2}.\text{day}^{-1}$ and that even the most sensitive vegetation species appear to be unaffected until dust deposition are at levels considerably greater than this⁴. This level can therefore be considered a benchmark, below which sensitive vegetation should not be affected. Indirect impacts may also occur on fauna, should impacts occur on foraging habitats⁵
- 5.1.2.2 Current background dust deposition levels are estimated to be a maximum of $50\text{mg.m}^{-2}.\text{day}^{-1}$ at Cambrian Quarry. It is not considered that the proposed operations would generate quantities of dust that would lead to exceedences of the benchmark criteria of $1000\text{ mg.m}^{-2}.\text{day}^{-1}$. A maximum guideline of value of $200\text{-}350\text{mg.m}^{-2}.\text{day}^{-1}$ dust deposition at a site boundary is normally used as an indicator that nuisance may be likely. As outlined within Section 6, the site will be operated with a series of best practice dust mitigation measures in place to ensure negligible risk of statutory nuisance, with the aim to ensure no exceedence of the guideline dust deposition values at the site boundary. Even if dust deposition levels are as high as $350\text{mg.m}^{-2}.\text{day}^{-1}$, this would still result in dust deposition levels at the SSSI which are less than half the benchmark value of $1,000\text{ mg.m}^{-2}.\text{day}^{-1}$. As such, no direct adverse impacts on the vegetation species which contribute to the SSSI status of Cambrian Quarry are predicted. As no adverse impacts are predicted on vegetation, including grassland and woodland within the SSSI which may provide foraging habitat for bats, no indirect impacts are predicted on horseshoe bats, which are the main reason for site SSSI status.

5.2 PM₁₀ Assessment

- 5.2.1 MTAN1 which is Welsh Assembly Guidance on aggregates advises the following:

⁴ Interim Advice Note 61/05 – Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs (Supplement to DMRB 11.3.1).
⁵ Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance, Institute of Air Quality Management, January 2012.

“The potential impact on health must always be considered in relation to proposals for aggregates extraction and a health impact assessment should be carried out for any proposal for a new quarry or sand and gravel pit located within one kilometre of an existing community”.

- 5.2.2 Although the proposals do not involve any extraction of aggregates/working of minerals within the quarry, the proposals include many of the activities associated with quarrying such as crushing, screening, stockpiling and haulage of inert materials. Therefore, a PM₁₀ assessment has been undertaken.
- 5.2.3 Emissions of PM₁₀ from recycling and restoration operations such as those proposed are difficult to quantify, given the fugitive nature of the potential dust sources. A previous COMEAP study undertaken on opencast coal mining activities⁶ indicated that average PM₁₀ concentrations were about 2µg.m⁻³ higher in communities adjacent to opencast coal sites when compared to control communities. As the proposals at Cambrian Quarry will not include all the activities associated with open cast coal mining, such as drilling and blasting, and since operations will not be on as large a scale as open cast mining activities, using this figure to estimate potential PM₁₀ impacts will provide a highly conservative, worst case assessment. Furthermore, this will be applicable to locations in the immediate vicinity of the quarry. Potential impacts will be lower at sensitive receptor locations which are located at greater distances from the quarry.
- 5.2.4 The current annual mean background PM₁₀ concentration is 11.72µg.m⁻³. Using the worst case process contribution of 2µg.m⁻³, the overall annual mean PM₁₀ concentration will be 13.72µg.m⁻³. Therefore, there will be no exceedence of the AQLV for annual mean PM₁₀. Furthermore, the overall impact on annual mean PM₁₀ concentrations is negligible, or imperceptible, in accordance with Environmental Protection UK guidance.⁷

⁶ Do Particulates from Opencast Coal Mining Impair Children's Respiratory Health, COMEAP, 1999.
⁷ Planning for Air Quality (2010 Update), Environmental Protection UK, 2010.

- 5.2.5 The potential number of short term exceedences of the 24-hour mean AQLV for PM₁₀ can be estimated using guidance in LAQM.TG(09), which provides the following formula:

$$\text{No. 24hr mean exceedences} = -18.5 + 0.00145 \times \text{ann. mean}^3 + \left(\frac{206}{\text{ann. mean}} \right)$$

Therefore:

$$-18.5 + 0.00145 \times 13.72^3 + \left(\frac{206}{13.72} \right) = 0.259$$

- 5.2.6 The above indicates that there would be less than 1 daily exceedence of the 24-hour mean AQLV for PM₁₀ during a calendar year. The AQLV allows up to 35 exceedences per calendar year.
- 5.2.7 Therefore, based upon the above, the proposals will not lead to any exceedences of AQLVs for PM₁₀, with the predicted short and long term PM₁₀ concentrations significantly below AQLVs. As such, in accordance with the PM₁₀ assessment framework, good practice measures will be sufficient to mitigate against any potential impacts from PM₁₀ emissions.

6 Mitigation

6.1 It should be borne in mind that the impacts presented in the previous section are conservative worst case predictions. The materials unloading/loading, storage and recycling operations will be undertaken at various points within the quarry void, with the operations shielded by a natural barrier in the form of the quarry side walls ranging in height from approximately 5m to 35m, depending on the stage of infilling. This will act to reduce wind disturbance of stockpiles and generation of wind blown dust. Furthermore, consideration should be given to the fact that on some occasions when wind direction and speed create potential for impacts, it will be raining, which will suppress any potential dust emissions. Reference should be made to Table 8 for the likely number of 'dry' working days for each wind sector.

6.2 A series of best practice measures can be used on site to prevent the risk of fugitive and PM₁₀ dust generation and impact. The mitigation measures to be used/implemented on site are summarised below. This is not an exhaustive list, but provided such measures are implemented, any dust impacts will be kept to a minimum, with the risk of dust impacts reduced to near zero at worst at all dust sensitive receptors.

- Limiting stockpiles to a maximum height of 5m to prevent wind whipping and regular spraying to prevent excessive drying and dust formation;
- Keeping material drop heights to a minimum during site operations;
- Surfacing of internal access road with hardstanding to enable efficient cleaning if required and maintaining site haulage roads in good condition;
- Use of a wheelwash facility to prevent mud and debris being tracked out onto the highway;
- Use of a surface water drainage system on the internal access road to prevent surface water from flowing down the internal access road to the highway;
- Use of a water bowser on site for dust suppression;
- Maintaining a site diary to log complaints and take remedial action, as necessary;
- Formal inspections for dust emission at the site boundary twice daily;
- Sheeting of vehicles delivering potentially dusty loads to site;

- Utilisation of dust suppression equipment on mobile crusher;
- Restriction of speed limits on site to 10mph; and,
- Care taken to avoid vehicles tracking through stockpiling areas.

6.3 Any potential dust emission from the haulage of materials to and from site can be controlled by sheeting vehicles which contain potentially dusty loads, hardsurfacing site haulage roads, using a wheel wash facility to prevent 'trackout' of material from the recycling and storage areas and imposing appropriate speed limits on site to prevent the risk of dust being raised by HGVs. A 10mph speed limit will be enforced on the site. It is proposed to install the wheelwash facility after the weighbridge at the top of the quarry. After this point, the internal access road will be surfaced with compacted stone. The final 200m of the internal access road (from Glyndwr Road to beyond the first hairpin) will be tarmac. The second hairpin of the internal access road will also be tarmac. In addition to this, the internal access road will have a surface water drainage system which will prevent surface water from flowing down the internal access road and onto the highway. Finally, care should be taken to avoid HGVs tracking through any stockpiling areas.

6.4 In order to control any potential dust emissions arising from recycling and infilling operations, drop heights will be kept to a minimum during material unloading, stockpiles will be limited to 5m in height to prevent 'wind whipping' of material, and will be kept wet, especially during prolonged periods of dry, windy weather by regular spraying. Mobile crushing and screening equipment will be fitted with dust suppression equipment, in accordance with manufacturer specification. A series of administrative measures will also be used on site to prevent the risk of dust emission which will include maintaining a site diary to log complaints and remedial action taken as necessary, in addition to regular inspections for dust emission at the site boundary twice daily.

7 Residual Impacts

- 7.1 Provided the best practice mitigation measures outlined in the previous section are implemented, the overall risk of dust impacts will be near zero at sensitive receptors, summarised in the following table.

Table 10 Summary of Impacts Before and After Mitigation

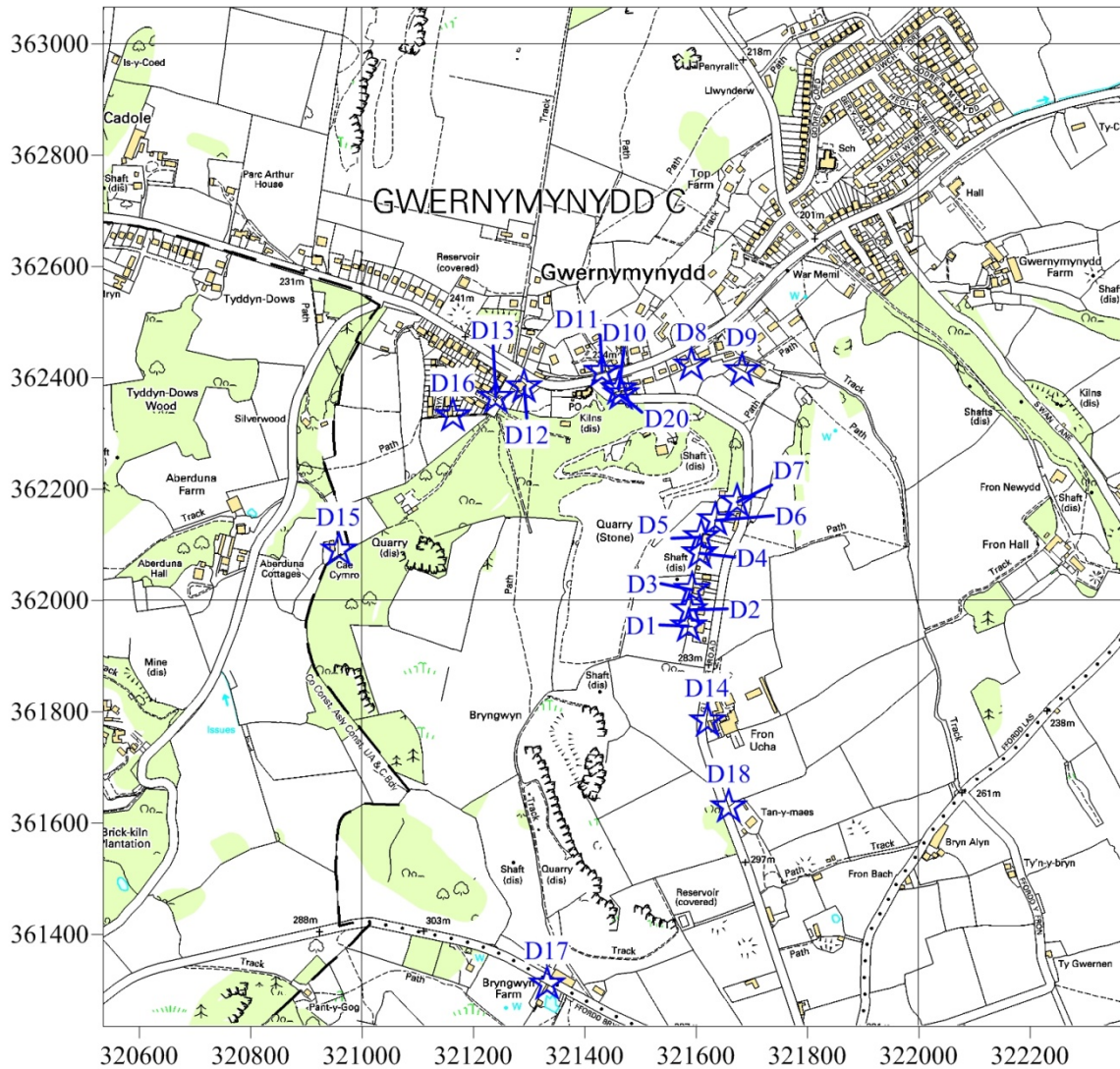
Receptor	Predicted Unmitigated Dust Impact	Predicted Dust Impact Following Implementation of Mitigation Outlined in Chapter 6
D10 to D13, D15 to D19	Near zero	Near zero
D1 to D4, D6 to D9, D14, D20	Low	Near zero
D5	Medium	Near zero

8 Conclusions

- 8.1 No significant impacts from deposited (nuisance) dust are predicted at any sensitive receptor locations surrounding the proposed restoration operations at Cambrian Quarry. A series of best practice dust mitigation measures will be implemented/followed during operations on site which will ensure that at worst, impacts from dust are 'near zero'
- 8.2 A PM₁₀ assessment has also been undertaken which has concluded that there will be no exceedences of long and short term AQLVs. Therefore best practice dust mitigation measures will be sufficient to ensure negligible impacts from any potential PM₁₀ emissions, in accordance with the relevant guidance.

Appendix 1

Sensitive Receptor Locations

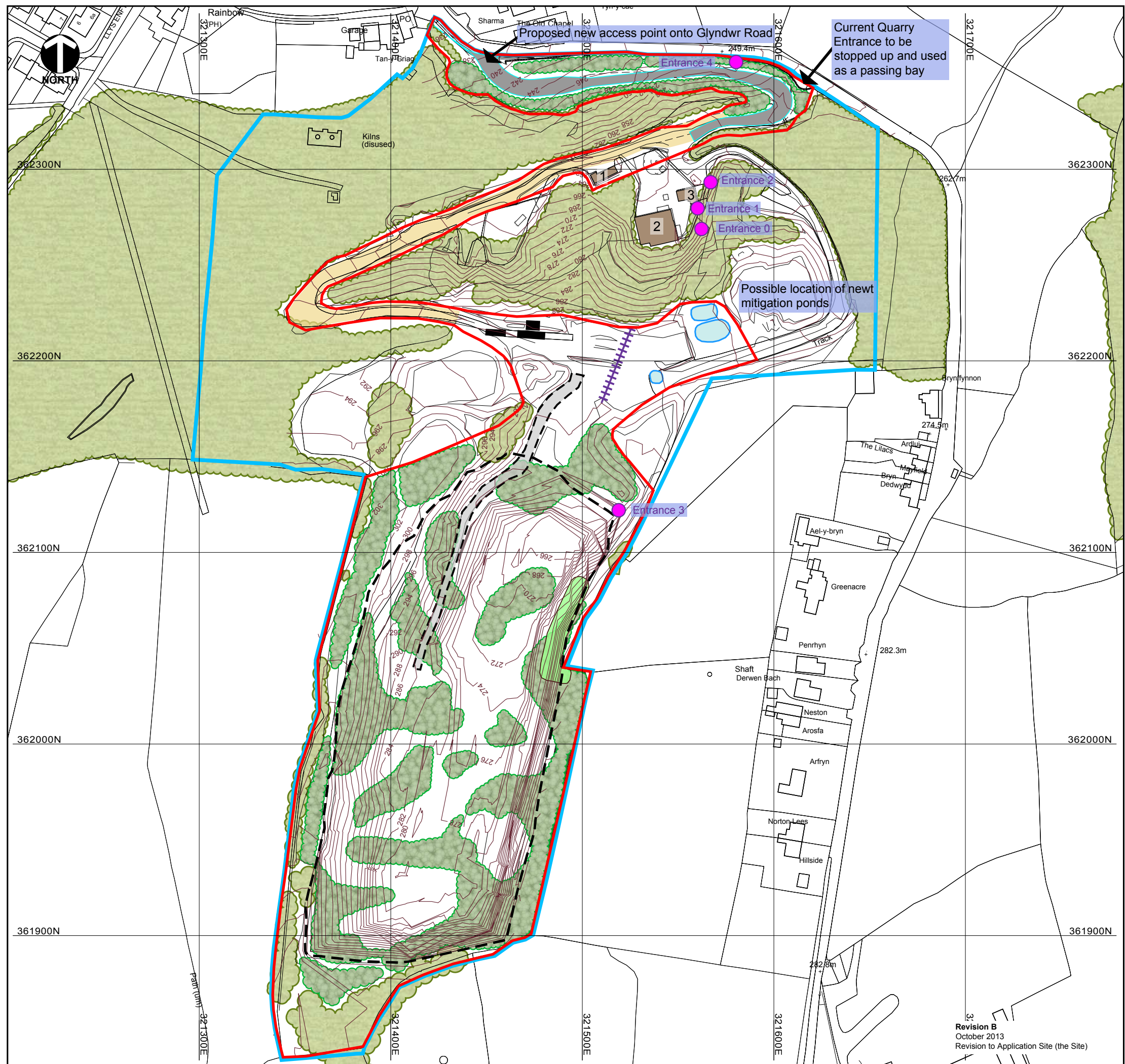


Appendix 1 Figure 1 - Dust Sensitive Receptors

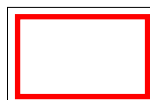
Oaktree Environmental Ltd
Unit 5 Oasis Park
19 Road One
Winsford
Cheshire
CW7 3RY



Appendix D



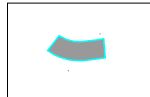
Legend



Revised Application Site (the Site)



Land within control of the Applicants



New Internal Access Road



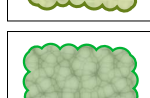
Existing Access Road to be upgraded



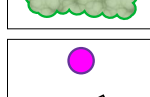
Existing access track into Cambrian Quarry Void



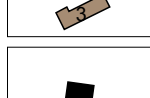
Area to be restored by infilling



Existing woodland



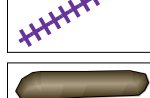
Proposed woodland planting



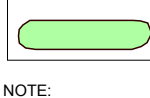
Mine entrance



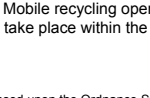
Old buildings



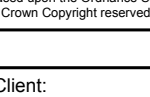
Proposed new office, weighbridge and wheelwash



Barrier to prevent vehicle access to the east



Existing screen mound



Proposed 3m high screen mound

NOTE:
Mobile recycling operations and the temporary storage of restoration/ recycled materials will take place within the Quarry void and will move within the void as infilling progresses

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Client:



ASH Resource Management
(Cambrian Quarry) Ltd

Drawing Title:

Cambrian Quarry Restoration Application
Application Site & Outline Development Proposals

Scale 1:2000 @ A3

Date October 2013

Plan No.
ASH/CQ/07 Rev B

CAD ref.
CA909-D16v6

Revision
Rev b

Sloane Mead
Minerals Development Consultants

Revision B
October 2013
Revision to Application Site (the Site)