



Crime Rigg Quarry SSSI Durham

Supporting Information

A supplement to the notification document

Contact points and further information

This supplement is issued on request by Natural England's Northumbria Team and is intended to be read in conjunction with the notification document for owners, occupiers and other notified parties. Our address for correspondence is:

Natural England
Northumbria Team
Lancaster House
Hampshire Court
Newcastle upon Tyne
NE4 7YH

Telephone number: 02080 265354

E-mail: Jenny.Loring@naturalengland.org.uk

Citizen Space: <https://consult.defra.gov.uk/natural-england/crime-rigg-quarry>

Your contact point for enquiries relating to this notification is **Jenny Loring**.

Contents

Summary

1. Information used to support the selection of Crime Rigg Quarry SSSI
2. Explanation of how the notification of additional land at Crime Rigg Quarry meets the SSSI selection guidelines
3. Explanation of why part of Crime Rigg Quarry SSSI is not considered to be of special interest
4. Assessment of the current condition of Crime Rigg Quarry SSSI
5. Selection of 'operations requiring Natural England's consent'
6. Site unit map
7. Photographs

Summary

Crime Rigg and Sherburn Hill Quarries was last notified as a Site of Special Scientific Interest (SSSI) under section 28 of the Wildlife and Countryside Act 1981 on 19 December 1990. The name is now changed to Crime Rigg Quarry SSSI to be consistent with the current operating name of the quarry and the Geological Conservation Review site name.

The notification is **varied** under section 28A of the Wildlife and Countryside Act 1981, to include a revised list of operations requiring Natural England's consent and a re-presented statement of Natural England's views on the management of the SSSI. The features of special interest have not changed but the citation describing them has been re-presented to describe them more clearly.

The SSSI has also been **extended** to include additional land notified under section 28B of the Wildlife and Countryside Act 1981.

Natural England is of the opinion that part of the SSSI is not of special interest and it is therefore proposed for **de-notification** under section 28D of the Wildlife and Countryside Act 1981.

The site is considered to be of special interest for its nationally important geological features: Crime Rigg Quarry is a key reference section for the Permian Yellow Sands Formation: extensive exposures through the Yellow Sands Formation, with overlying Marl Slate and Raisby Formations, are present. The Yellow Sands Formation is interpreted as a linear (Seif) desert dune system and the relationship with the overlying marine Marl Slate and Raisby Formations marks the onset of the Upper Permian Zechstein transgression (sea level rise).

1. Information used to support the modification of Crime Rigg Quarry SSSI

Feature	Data source	Author	Date	Content
Geology	An Introduction to the Geological Conservation Review. Geological Conservation Review Series. JNCC, Peterborough. http://archive.jncc.gov.uk/default.aspx?page=2965	Ellis, N.V. (ed.), Bowen, D.Q., Campbell, S., Knill, J.L., McKirdy, A.P., Prosser, C.D., Vincent, M.A. & Wilson, R.C.L.	1996	Background to the Geological Conservation Review
	Permian and Triassic Red Beds and the Penarth Group of Great Britain. Geological Conservation Review Series No. 24. JNCC, Peterborough. http://archive.jncc.gov.uk/page-2967	Benton, M.J., Cook, E. & Turner, P.	2002	Detailed description and justification for inclusion of Crime Rigg Quarry in the Geological Conservation Review
	Guidelines for the removal of an SSSI notification (de-notification)	English Nature	2005	National guidelines for identifying cases where de-notification may be appropriate
	Natural England SSSI archive site file (General and Scientific)	Natural England	1992-2007	Historical details of planning and development matters
	Specialist support for the modifications to Crime Rigg Quarry SSSI	Larwood, J.	2019	Support from Natural England's Senior Geologist

2. Explanation of how the notification of additional land at Crime Rigg Quarry meets the SSSI selection guidelines

This section explains how the information listed in section 1 has informed our decision to notify the additional land, according to the selection guidelines listed in *An Introduction to the Geological Conservation Review* (Ellis *et al.* 1996).

2.1 Geology

2.1.1 Selection of Geological Conservation Review sites

The special geological interests within Crime Rigg Quarry SSSI were selected for inclusion in the Geological Conservation Review (GCR) of Great Britain and are described under 'Crime Rigg Quarry'. The GCR systematically assessed sites to identify key localities that aid the interpretation of the geological evolution of Great Britain. Each GCR site demonstrates a unique and/or representative feature of this geological evolution, and the relationship between sites is particularly important in building up a picture of landscape evolution, and biological and environmental change over time.

All SSSIs with a geological interest have been assessed through the GCR process and sites described in the Review are eligible for selection on the basis of one or a number of the following categories:

- (1) Sites of importance to the **international** community of Earth scientists.

- (2) Sites that are scientifically important because they contain **exceptional** features.
- (3) Sites that are nationally important because they are **representative** of an Earth science feature, event or process that is fundamental to Britain's Earth history.

Crime Rigg Quarry SSSI has been selected under category three, demonstrating the evolution of the terrestrial Permian Yellow Sands Formation and the overlying marine Marl Slate and Raisby Formations.

Crime Rigg Quarry is included in the Permian and Triassic Red Beds and the Penarth Group GCR network. Specifically it is one of 23 GCR sites selected to encompass the entire Yellow Sands Formation of the Permian Red Beds of Great Britain. It is the only site selected to illustrate the Permian Red Bed facies of north-east England. Other sites, such as 'Claxheugh Rock and Ford Limestone Quarry SSSI', include sections in the Permian Yellow Sands Formation (though not as complete) and are included in the Marine Permian GCR network.

2.1.2 The Geology of Crime Rigg Quarry

Crime Rigg Quarry is currently worked for the Permian Yellow Sands and for the Magnesian Limestone of the Raisby Formation. The quarry exposes an extensive vertical and lateral section through the Permian Yellow Sands Formation and shows its relationship with the overlying Marl Slate and Raisby Formations (see photographs 2-5 in section 7).

The Yellow Sands here reach approximately 30 metres in thickness, thinning eastwards. They exhibit complex large scale cross-bedding with typically well rounded (and often frosted) sand grains characteristic of an aeolian (desert) environment. The Yellow Sands have been interpreted as a linear (Seif) dune system (examples of which are found in the present day Sahara) made up of a series of elongate ridges or 'draa' (up to 20 metres thick, 1.5 to 3.5 km wide, and 13 km long) that migrated across the area at the end of the Middle Permian, approximately 290 million years ago.

The overlying marine Marl Slate (up to 4 metres thick) infills hollows in the upper surface of the Yellow Sands. It represents the rapid inundation and rise in sea level of the Upper Permian Zechstein Sea and is followed by the deposition of the Magnesian Limestone of the Raisby Formation about 255 million years ago.

Crime Rigg Quarry provides a cross-section through part of one of the Seif ridges. The Yellow Sands thin towards the east as they approach the outer edge of the dune ridge, and the thickness of the overlying Marl Slate and, particularly, the Raisby Formation increases. Crime Rigg enables a detailed (and three dimensional) understanding of the mechanism of dune formation (both lateral migration and vertical accretion) and the subsequent sea level rise that marked a significant environmental change from a desert to marine environment.

2.1.3 Site boundary determination

Crime Rigg Quarry is an active working quarry owned and worked by the Breedon Group. The SSSI boundary as previously notified in 1990 was drawn to encompass the quarries subsequently described by Benton *et al.* (2002), the boundary being drawn to include quarry faces and coincident with the mineral permission at that time. The previously notified land was subject to pre-existing planning permissions that allowed extraction of the Permian Yellow Sands and Magnesian Limestone. These areas have been largely quarried and parts of the void that is left have now been infilled and restored. Throughout this management, exposures demonstrating the features of interest were maintained.

During the progression of sand/rock extraction, a part of the quarry not included in the original notification was found to exhibit an extension of the features of interest.

The revised boundary has been drawn to encompass existing features of interest and additional land, comprising the entirety of the extended mineral permission, to the east (see photograph 1 in section 7).

3. Explanation of why part of Crime Rigg Quarry SSSI is not considered to be of special interest

This section explains why Natural England is of the opinion that part of the SSSI is not of special interest, according to the *Guidelines for the removal of an SSSI notification (denotification)* (English Nature, 2005), hereafter referred to as the 'Denotification Guidelines'.

The Denotification Guidelines (section 3.1, p.5) state that:

'[Natural England] will adopt a precautionary approach to the question of the existence of special interest in cases where denotification is under consideration and in doing so will apply a set of guiding principles to assess whether a site (or part of a site) is of special interest' these are:

- i. Whether the interest meets the requirements of...the *Geological Conservation Review*.
- ii. If restoration of the special interest is possible or practicable.
- iii. Where the special interest has moved entirely outside the site, but remains adjacent or in close proximity, the site will not be denotified until the land now containing the special interest is notified.
- iv. Where there is some prospect that natural processes may return the special interest within a reasonable time, the site is unlikely to be denotified.
- v. Where cartographical errors were included in the original notification of the site.
- vi. A change of special interest from that for which it was notified, or a change that will lead to a new special interest, will not usually be a reason for denotification.

The first of these principles is applicable at Crime Rigg Quarry. The part of Crime Rigg Quarry proposed for de-notification has been lawfully worked out under pre-existing mineral permissions and is now either quarry void, infilled or restored. Natural England is therefore of the opinion that it is no longer possible to conserve that part of the site. Accordingly it does not meet the required operational criteria of the GCR site selection process and is proposed for de-notification as it is not of special interest.

4. Assessment of the current condition of Crime Rigg Quarry SSSI

Site unit numbers*	Interest features	Reported condition**	Date of last assessment
1	Permian Yellow Sands Formation and its relationship with the overlying Marl Slate and Raisby Formations	Favourable	1 November 2017
2		Destroyed	
3			

* **Site units** are divisions used by Natural England for administrative purposes only.

** **Reported condition**

SSSIs are notified because of special biological or geological features. When these features are being managed so that their special nature conservation interest is being maintained they are reported to be in a favourable condition. This is a United Kingdom standard and the terminology and definitions are more fully described in A Statement on Common Standards Monitoring, produced by the Joint Nature Conservation Committee (JNCC) in 1998.

5. Selection of ‘operations requiring Natural England’s consent’

Natural England selects operations from a master list when determining the list of operations requiring consent for individual SSSIs. The selection is based on the likelihood that the operations may cause damage to the special features that are the reasons for notification of the SSSI. As well as selecting operations from the master list, the precise wording of each operation may be tailored to suit the particular circumstances at the site.

It is not possible to predict every possible eventuality that may arise on a site but the aim is to identify all operations where it is reasonably foreseeable that, if carried out at certain times or in a particular manner somewhere within the SSSI, they are likely to damage the special interest features. The table below records at least one reason justifying the inclusion of each operation in the list for Crime Rigg Quarry SSSI. The reasons for listing the operations identified are not intended to be exhaustive and in most cases there will be other ways in which the specified operation is likely to cause damage.

Some amendments to the list recognise that the site’s management will change from operational quarry with associated processing and depot functions, to a post-operational aftercare stage over the life of the current planning consents.

Standard reference number	Type of operation	At least one reason for listing
7.	Dumping, spreading or discharging of any materials on or against geological exposures of importance in the quarry wall or floor.	Risk of obscuring the geological features and access for study
12.	Tree and/or woodland management and alterations to tree and/or woodland management (including planting, felling, pruning and tree surgery, thinning, coppicing, changes in species composition and removal of fallen timber).	Vegetation obscures the features of interest and hinders access for study. Tree roots can damage geological features and management operations may damage or obscure exposed and near-surface geological features.
14.	Alterations to water levels and tables and water utilisation (including irrigation, water storage in disused quarries and abstraction from existing water bodies and through boreholes). Also the modification of current drainage operations (such as the installation or removal of pumps).	Operations which could impact upon the hydrology or increase erosion of the features of interest or prevent safe access.
15.	Creation, infilling or digging of ditches, drains, ponds, pools, marshes or pits.	Operations which could impact upon the hydrology or increase erosion of the features of interest or prevent safe access. Could also cause direct damage or destruction of geological features.
20.	Extraction of minerals including hard rock, sand, gravel, limestone and spoil.	Could cause direct damage or destruction of geological features.
21.	Destruction, construction, removal, rerouting or regrading of roads, tracks, quarry floor, walls, fences, hardstands, banks, ditches or other earthworks, including soil and soft rock exposures or the laying, maintenance or removal of pipelines and cables, above or below ground.	Could cause direct damage or destruction of geological features.

Standard reference number	Type of operation	At least one reason for listing
22.	Storage or infill of materials on or against rock faces, outcrops and quarry floor.	Risk of obscuring or damaging features of interest or impeding access to the features.
23.	Erection, removal or destruction of permanent or temporary structures, or the undertaking of engineering works, including drilling.	Risk of obscuring or damaging features of interest or impeding access to the features.
24a.	Modification of natural or man-made features and clearance of boulders, large stones, loose rock or spoil.	Direct loss of or incidental damage to important features. Loss of resource for study, education and amenity.
24b.	Battering, buttressing, grading or seeding of geological exposures and cuttings (rock faces, spoil and soil) and infilling of pits and quarries.	Direct loss of or damage to important features. Loss of resource.

6. Site unit map

The modified SSSI boundary encompasses land that is divided into three units for the purposes of reporting on the condition of the special interest feature. Unit 1 is the remaining quarry face in the western, worked out, area of the quarry. Unit 2 is the additional notified land where exposed faces will remain within the restoration area. Unit 3 is the land proposed for de-notification

The map on the following page shows the provisional boundaries of the site units, which are divisions used by Natural England for administrative purposes only.

Insert site unit map here

7. Photographs



Aerial photography and height data © Bluesky International Ltd/Getmapping PLC

Photograph 1

Crime Rigg Quarry SSSI
boundary shown in red



Scale (at A3): 1:5,019

Map produced by Denise Rose,
Resilient Landscapes & Seas Team
Date: 13/09/2019.

Contains, or is derived from, information
supplied by Ordnance Survey. © Crown
copyright and database rights 2019.
Ordnance Survey 100022021.

Photograph 2: North face within the previously notified SSSI (Unit 1). Infilled area to west (soil embankment) (see photo 4). Main face shows Permian Yellow Sands Formation (approximately the lower 75%), overlain by Marl Slate and Raisby Formation Magnesian Limestone (approximately the upper 25%). * denotes location of former SSSI boundary as previously notified in 1990



Photograph 3: Additional land (Unit 2). North face of eastern extension currently exposing Raisby Formation Magnesian Limestone. * denotes location of former SSSI boundary as previously notified in 1990



Photograph 4: Detail of western extent of SSSI (Unit 1). North face showing infill embankment and northern face exposing Yellow Sands Formation overlain by Marl Slate and Raisby Formation



Photograph 5: Western end of SSSI (Unit 1). South face showing infill embankment and southern face exposing Yellow Sands Formation

