

Site Name

Kensworth Nature Reserve

BEDFORDSHIRE LOCAL GEOLOGICAL SITE DESIGNATION FORM

SITE LOCATION, ACCESS, OWNERSHIP, STATUS & SUITABILITY

(1) **Name of site:** Kensworth Nature Reserve

(2) **National grid reference:** TL 011 199

(3) **Unitary authority:** Central Bedfordshire

(4) Site access and local amenities

The site is located within a publicly accessible Nature Reserve that was created by an early phase of restoration of the working Kensworth Chalk Pit. The site is reached by public footpaths, either from the car park (CP1) on Dunstable Downs or from the Cemex car park (see map at the end of this document). Permission to use the Cemex car park must be gained from the owners (see below).

There is a full range of amenities at the National Trust Chilterns Gateway Centre on Dunstable Downs.

(5) **Site ownership:** Cemex UK Cement Ltd.

(6) **Mineral rights ownership:** N/A

(7) Is permission needed to access the site?	a. No ✓	b. Yes
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Related information:

The large working quarry east of the Nature Reserve is called Kensworth Chalk Pit. It is a geological SSSI that provides an unrivalled reference section for the boundary between the Turonian Middle Chalk and the Coniacian Upper Chalk. Of particular importance is the Chalk Rock, a distinctive marker horizon that has yielded many well preserved and rare fossils. Occasional accompanied visits are allowed. For further information, or for permission to use the Cemex car park, contact:

Martin Lithgoe
 Cemex UK Cement Ltd.
 Kensworth
 Dunstable
 Bedfordshire
 LU6 2PR
 Tel: 07970 466 486

(8) **Site status:** Active Disused Historical Managed ✓ Restored ✓ New Other

(9) Suitable for visits by:	a. General public ✓	b. Small parties ✓	c. Large parties ✓
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d. Primary school	e. National Curriculum	f. AS/A-Level ✓
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g. Adult ✓	h. Undergraduate teaching ✓	i. Research ✓
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(10) Site suitable for frequent visits by parties?	a. No	b. Yes ✓
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(11) Should collecting and hammering be encouraged at the site?	a. No	b. Yes ✓
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SITE DESCRIPTION		
(12) Exposure type:	a. Inland natural outcrop	b. Road cutting
	c. Railway cutting	d. Active quarry/pit
	e. Disused quarry/pit ✓	
	f. Old mine workings	g. Mine dump
	h. Active mine	
(13) Dimensions of exposure of interest: A single face c.35 x 5m.		
(14) Main interest(s):	a. Structural	b. Geomorphological
	c. Mineralogical	
	d. Palaeontological ✓	e. Petrological
	f. Stratigraphical ✓	
<p>(15) Summary description and reason for designation This exposure was retained during an early phase of the ongoing restoration of the enormous Kensworth Chalk Pit. The aim was to create a safe and accessible site where at least some of the features periodically exposed in the working quarry could be examined routinely. The area around the preserved face has been designated a Nature Reserve and it includes re-created calcareous grassland and woodland habitats.</p> <p>Exposed at the site is a section from the upper part of the Upper Turonian Lewes Nodular Chalk Formation into the Lower Coniacian Top Rock. It is possible to see three small faults with minor displacement, a large solution hollow with an infill of rubbly chalk and large flint nodules, and smaller solution pipes near the top of the exposure filled with red-brown Clay-with-flints. The Reed (Caburn) Marl occurs in the lower part of the succession at the northern end of the face, whilst the Chalk Rock hardground is exposed about half way up the face at the southern end.</p>		
<p>(16) What threats exist for the site? Natural weathering of the face and plant colonization gradually obscures the subtle features within the Chalk.</p>		
<p>(17) What additional work is required to enhance this site? The rock face has recently been cleared, but ongoing volunteer labour on an annual basis will be needed to keep it in good condition. There is an information board at the site.</p>		
<p>(18) Published/unpublished references to the site and wider area Bromley, R.G. & Gale, A.S. 1982. The lithostratigraphy of the English Chalk Rock. <i>Cretaceous Research</i>, 3, 273-306. Mortimore, R.N., Wood, C.J. & Gallois, R.W. 2001. <i>British Upper Cretaceous Stratigraphy</i>. Geological Conservation Review Series, 23, 558 pages. (This book includes detailed information on Kensworth Chalk Pit, the neighbouring SSSI). Shephard-Thorn, E.R. <i>et al.</i> 1994. <i>Geology of the country around Leighton Buzzard</i>. Memoir for 1:50,000 geological sheet 220 (England and Wales). London HMSO. Stokes, R.B. 1977. The echinoids <i>Micraster</i> and <i>Epiaster</i> from the Turonian and Senonian chalk of England. <i>Palaeontology</i>, 20, 805-21. Wood, C.J. 1990. The stratigraphy of the Middle and Upper Chalk of the Rugby Portland Cement Co. working quarry at Kensworth, Bedfordshire. <i>British Geological Survey Technical Report</i>, WH/90/99R. Wray, D.S. & Gale, A.S. 2006. The palaeoenvironments and stratigraphy of Late Cretaceous Chalks. <i>Proceedings of the Geologists' Association</i>, 117, 145-162. Wright, C.W. 1979. The ammonites of the English Chalk Rock (Upper Turonian). <i>Bulletin of the British Museum (Natural History), Geology Series</i>, 31, 281-332. <i>Cretaceous Chalk: Dunstable and Whipsnade Downs</i>. www.bedfordshiregeologygroup.org.uk <i>Lime and Cement from the Chalk</i>. www.bedfordshiregeologygroup.org.uk</p>		

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SCIENTIFIC SIGNIFICANCE		
(19) Does the site exhibit features of local importance?	a. No	b. Yes ✓
(20) Is the site already a designated SSSI?	a. No ✓	b. Yes
(21) Collector interest: a. Rare species	b. Common species ✓	c. Local significance ✓
	d. Regional significance	e. National significance
<p>(22) List of confirmed fossils, minerals, etc: Fossils are quite hard to find in this small exposure, but occasional brachiopods, bivalves, echinoids, gastropods, sponges and trace fossils turn up, viz:</p> <p>Brachiopods: <i>Terebratulina lata</i></p> <p>Bivalves: <i>Inoceramus cuvieri</i>, <i>Spondylus spinosus</i></p> <p>Echinoids: <i>Epiaster michelini</i>, <i>Micraster</i></p> <p>Gastropods: <i>Bathrotomaria</i>, <i>Turritella</i></p> <p>Trace fossils: <i>Thalassinoides</i></p>		

HISTORICAL/AESTHETIC VALUE		
(23) Does the site have important historical associations?	a. No ✓	b. Yes
(24) Does the site form a key part of an attractive or evocative landscape?	a. No ✓	b. Yes
<p>(25) Full description of site and its significance:</p> <p>The succession begins in the <i>Terebratulina lata</i> Zone of the Middle Chalk and extends upwards to a horizon in the <i>Micraster cortestudinarium</i> Zone of the Upper Chalk, just above the Top Rock. The exposure is capped by Clay-with-flints, a red-stained superficial Quaternary deposit, which fills surface irregularities and solution pipes in the top of the chalk.</p> <p>In the lower part of the exposure the Middle Chalk is represented by massive white chalk with some nodular chalk bands containing sponges. It contains a thin (5cm-thick) greenish-grey marl seam, called the Reed Marl, which can be correlated over wide distances and is equivalent to the Caburn Marl.</p> <p>The junction between the Middle and Upper Chalk is marked by the base of the Chalk Rock (70cm-thick). This is a 'welded' sequence of chalkstones with associated weakly glauconised hardgrounds* and penetrative <i>Thalassinoides</i> burrow systems. The terminal hardground is irregular and strongly phosphatised and glauconised, and is locally very fossiliferous. It represents an extremely condensed form of the 'basal complex' of the Upper Chalk elsewhere.</p> <p>Some 2m of chalkstones occur between the top of the Chalk Rock and the Top Rock. These are extremely hard with a slight pink coloration and surmounted by a glauconised convolute hardground strewn with glauconised pebbles. The Top Rock represents a condensed sequence in a similar manner to the Chalk Rock, and the junction of the <i>Sternotaxis plana</i> and <i>Micraster cortestudinarium</i> zones lies near its base.</p> <p>Above this is a thin development of white Upper Chalk containing some nodular flints, ending with an irregular erosion surface topped by Clay-with-flints.</p> <p>* Hardgrounds in the chalk were developed over structural highs in the chalk seas, undergoing early diagenetic cementation by glauconite and phosphates just beneath the sea floor, followed by erosion and boring by marine organisms (creating the trace fossils <i>Thalassinoides</i>) and the welding of more cemented chalk on to the surface.</p>		

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RECORDER'S DETAILS

(26) **Name:** Anne Williams (27) **Organisation:** Geologist, BGG

(28) **Date of designation:** November 2010

CURRENT SITE CONDITION

(29) Site condition at August 2010 is GOOD; assessed by Martin Whiteley

NOTES

(30) For further details contact Anne Williams: annew36@hotmail.com

