Tables

Table 3.1 Main geological features of the marine Permian GCR sites in the Durham Province of the English Zechstein

Durham Province

	Site	Interest
Cycle 3		
Seaham Formation	Seaham	Type section; complex calcite concretions; *Calcinema;* crinkled algal stromatolites; foundered strata
	Blackhalls Rocks	Calcite concretions; foundered, partly collapse-brecciated
Cycle 2		
Seaham Residue (of Fordon Evaporites)	Seaham	Type section; distinctive lithology; plastic deformation; dedolomites
	Blackhalls Rocks	Incidental occurrence
Roker Dolomite Formation	Seaham	Typical lithology passing up to dedolomitized brecciated rock at top
	Blackhalls Rocks	Typical lithology
	Ryhope Cutting (part of Tunstall Hills south)	Partly dedolomitized collapse-breccia with infiltrated cavity-fill
	Hawthorn Quarry	Slightly atypical lithology, partly dedolomitized; collapse-brecciated in east
Concretionary Limestone Formation	Fulwell Hills quarries	Bizarre calcite concretions; Fulwell Fish-bed and other laminites; foundered strata
	Trow Point to north end of Marsden Bay, South Shields	Dedolomitized collapse-breccias with infiltrated cavity-fill
	Marsden Bay, South Shields	Interbedded laminated and turbiditic dolomitized slope carbonate mudstones to grainstones; calcite concretions; dedolomites; foundered strata and breccia-gashes
Cycle 1		
Residue of Hartlepool Anhydrite	Trow Point to Frenchman's Bay, South Shields	Typical evaporite-dissolution residue underlying collapse-breccias
	Ryhope Cutting (part of Tlinstall Hills south)	Near-reef evaporite-dissolution residue; evidence of past plastic flow
?Ford Formation, Heselden Dene Stromatolite Biostrome	Blackhalls Rocks, Hawthorn Quarry	Coarse conglomerate of rolled blocks of dolomitized reef boundstone overlain by dolomitized algal laminites with spectacularly large domes
Ford Formation, Trow Point Bed	Trow Point	Type section of Trow Point Bed; a distinctive thin unit of marine oncoids, peloids and columnar stromatolites, partly dedolomitized

Ford Formation, shelf-edge reef facies	Claxheugh Rock, Cutting and Ford Quarry, Hawthorn Quarry, Humbledon Hill Quarry, Hylton Castle Cutting, Stony Cut (Cold Hesledon), Tunstall Hills (N and S), Horden Quarry	Massive mainly dolomitized fossiliferous reef boundstone, comprising several sub-facies: reef-base at Claxheugh Rock and Humbledon Hill; basal coquina at Tunstall Hills (N); reef-core at Claxheugh Rock, Cutting and Ford Quarry, Hylton Castle, Humbledon Hill and Tunstall Hills (N and S); reef-backreef contact at Ford Quarry; reef-flat at Hawthorn Quarry and Stony Cut; reef talus at Tunstall Hills (S); reef fissures at Tunstall Hills (N); reef crest at Ford Quarry, Horden Quarry and Stony Cut; reef-top erosion surface at Hawthorn Quarry. Humbledon Hill Quarry and Tunstall Hills are renowned historical faunal sites
Ford Formation, backreef facies	Claxheugh (Ford) Cutting and Ford Quarry	Reef-backreef contact; sparingly fossiliferous dolomitized mudstone/wackestone with allochthonous slide-blocks or olistoliths (best seen in cutting)
	Gilleylaw Plantation Quarry, Silksworth	Dolomitized ooid grainstones overlain by shelly algal-bryozoan patch-reef; coarse oncoids and lamellar stromatolites at top
	Trimdon Grange Quarry, Trimdon	Typical cross-laminated shallow-water ooid grainstones, extensively replaced by calcite after secondary ?anhydrite; bioturbated
Raisby Formation	Raisby Quarries	Type locality; thick primary limestones; diagenetic breccia; mineralized
	Dawson's Plantation Quarry	Debris flow near base of formation; typical lithology; spatulate listric joints and fractures
	High Moorsley Quarry	Typical lithology with thin debris flow and evidence of large-scale downslope sediment sliding; mineralized; cambered (Quaternary feature)
	Trow Point	Typical lithology; much evidence of bioturbation; major submarine slide-plane overlain by debris flow with exceptionally large slide-blocks (olistoliths)
Marl Slate	Claxheugh Rock, Frenchman's Bay	Typical lithology; was locally fluidized and injected downwards into fissures; partly removed by submarine sliding
	Raisby Quarries	Typical lithology; thins against crest of ridge in Basal Permian Sands

Basal Permian Sands ',mainly pre-Cycle 1)	Claxheugh Rock, Frenchman's Bay, Raisby Quarries	Typical lithology; top involved in submarine slide-breccia at Claxheugh Rock; remains of fluidized Marl Slate in fissures at Claxheugh Rock; forms ridge in floor of Raisby Quarry and at head of Frenchman's Bay

Table 4.1 Main geological features of the marine Permian GCR sites in the Yorkshire Province of the English Zechstein.

Yorkshire Province		
	Site	**Interest**
Cycle 1 / Cycle 2		
Ellington Formation	River Ure Cliff, Ripon	The only permanent surface exposure of Permian evaporites in north-east England; much gypsum after anhydrite, partly strongly internally folded; many satin-spar veins; foundered limestones of Brotherton Formation (Cycle 3) with *Calcinema*
Cycle 1		
Cadeby Formation (Sprotbrough Member), transitional to Edlington Formation	Quarry Moor, Ripon	Unevenly interbedded algal-laminated dedolomitized ooid grainstones and evaporite dissolution residues; expansion structures; algal-laminated dolomite ooid grainstones
Sprotbrough Member on Wetherby Member	Micklefield Quarry, New Micklefield	Typical dolomitized ooid grainstones of sandwave facies rests on full sequence of peritidal Hampole Beds; fenestral ('birds' eye') fabric; Hampole Discontinuity
	Cadeby Quarry, Cadeby	Typical dolomitized ooid grainstones of sandwave facies rests on atypically thick Hampole Beds; Hampole Discontinuity with relief of 3 m+; Wetherby Member with unusually tall patch-reefs and thick dolomite domed algal laminites
Wetherby Member	Wood Lee Common, Maltby	Selectively eroded dolomitized bryozoan patch-reefs form tors on grassy slope
	South Elmsall Quarry	Dolomitized bryozoan–algal patch-reef in peloidal and oncoidal shelf grainstones; stromatolite domes
	Ashfield Brick-clay Pit, Conisbrough	Dolomitized bryozoan patch-reef in dolomitized ooid grainstones, on bedded skeletal grainstones and rudstones (coquinas), on dolomitic siliciclastic mudstones
	Newsome Bridge Quarry, North Deighton	Dolomitized inferred patch-reef in peloidal and oncoidal shelf grainstones lies on eminence in Carboniferous Permian unconformity; rock litter

Wetherby Member on Basal Permian Sands	Bilham Quarry	Basal shelf dolomite mudstones/wackestones of the Cadeby Formation on incoherent marine-redistributed aeolian sand-rock
	Ashfield Brick-clay Pit, Conisbrough	Basal dolomitic siliciclastic mudstones on atypically pebbly red friable sandstone

References