

Underlying unit(s): Rauchkofel Limestone (conformable contact).

Overlying unit(s): Feldkogel Formation (conformable contact), Plotta Lydite (unconformable contact).

Lateral unit(s): Hohe Warte Limestone, Seewarte Limestone, Lambertenghi Limestone, Spinotti Limestone, Kellergrat Reef Limestone.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: SCHÖNLAUB & HISTON (2000), SCHÖNLAUB et al. (2004).

Hohe Warte-Kalk / Hohe Warte Limestone

THOMAS J. SUTTNER, ERIKA KIDO

Validity: Invalid; lithologically well described by BANDEL (1969); additional stratigraphy and facies analysis by VAI (1973), SCHÖNLAUB & FLAJS (1975), SCHÖNLAUB (1980b) and POHLER (1982); summary on this unit is provided by KREUTZER (1990, 1992b: p. 27); detailed biostratigraphy is given by SUTTNER (2007b), who used the name Hohe Warte Formation for this unit.

Type area: ÖK50-UTM, map sheets 3108 Sillian, 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3116 Sonnenalpe Naßfeld (ÖK50-BMN, map sheets 196 Obertilliach, 197 Kötschach).

Type section: -

Reference section(s): Section along the lower part of the Koban-Prunner route at the northern wall of Mount Hohe Warte [= Monte Coglians] (SCHÖNLAUB & FLAJS, 1975; KREUTZER, 1990: p. 296), N 46°36'29" / E 12°53'17"; Seewarte (N 46°36'35" / E 12°52'15"), southern continuation of Seekopf, Biegengebirge (BANDEL, 1969; SCHÖNLAUB et al., 2004).

Derivation of name: After Mount Hohe Warte (KREUTZER, 1992a: p. 270).

Synonyms: Riffkalk-Facies der Stockwerke H-G-H [partim] (STACHE, 1884, p. 339); Korallenriffkalk am Wolayer- u. Seekopf-Thörl [partim] (FRECH, 1887: p. 700); unterdevonischer Riffkalk [partim] (FRECH, 1894b: p. 229); Riffkalk mit *Karpinskya conjugula* (GAERTNER, 1931); Schichten mit *K. conjugula* (PÖLSLER, 1967); Helle Crinoiden-Kalke (BANDEL, 1969); bioclastic Ist. (SCHÖNLAUB, 1980b: Fig. 3); Heller Crinoidenschuttalk mit *Karpinskya conjugula* (SCHÖNLAUB, 1985a); Riffkalke des Prag (SCHÖNLAUB, 1985a); Heller Crinoidenschuttalk (KREUTZER, 1990: Fig. 19); Riffkalk (KREUTZER, 1990: Fig. 19); Hohe Warte Formation (SUTTNER, 2007b; not formalized).

Lithology: Massive, light grey limestone.

Fossils: Calcareous algae brachiopods, conodonts, corals, crinoids, cyanobacteria, gastropods, stromatoporoids, trilobites.

Origin, facies: Marine limestone, neritic unit with patch reefs; Southern Shallow-water Facies (KREUTZER, 1992a).

Chronostratigraphic age: Pragian.

Biostratigraphy: ?*serratus-celtibericus* conodont zones (SUTTNER, 2007b).

Thickness: 350 m.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: According to its microfacies a reefal and a crinoidal limestone unit are described (VAI, 1967; BANDEL, 1969); within the paper of BANDEL (1969) this unit was divided into "Schicht 1-20".

Underlying unit(s): Rauchkofel Limestone (conformable contact).

Overlying unit(s): Seewarte Limestone (conformable contact).

Lateral unit(s): Gamskofel Limestone, Kellerwand Limestone.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: GORTANI (1912), PICHL (1929), VAI (1968, 1998), KODSI (1971), SCHÖNLAUB (1971–1973, 1984b, 1991), ELLERMANN (1992), LATZ (1992), KREUTZER et al. (1997, 2000), SCHÖNLAUB & KREUTZER (1997), SCHÖNLAUB & HISTON (2000), HUBMANN et al. (2003), MAY et al. (2004), SUTTNER (2005), CARULLI (2006), VENTURINI (2006), HUBMANN & SUTTNER (2007).

Kellerwand-Kalk / Kellerwand Limestone

THOMAS J. SUTTNER, ERIKA KIDO

Validity: Invalid; description is given by SCHÖNLAUB (1985a: p. 43); facies of this limestone at Mount Cellon is observed by KREUTZER (1990: p. 280) and SCHÖNLAUB et al. (2004: p. 22); summary of unit is given by KREUTZER (1992b).

Type area: ÖK50-UTM, map sheets 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3116 Sonnenalpe Naßfeld (ÖK50-BMN, map sheet 197 Kötschach).

Type section: -

Reference section(s): Lower part of the Kellerwand – located between Obere Valentinalm and Eiskarkopf (N 46°36'54" / E 12°54'39"), Cellon avalanche gully, Kleiner Pal (KREUTZER, 1990: p. 282, 1992b).

Derivation of name: After the lower Kellerwand below the Eiskar glacier (KREUTZER, 1989).

Synonyms: Calcari stratificati giallastri [partim] (SPALLETTA et al., 1982); yellow bedded limestone [partim] (SPALLETTA & VENTURINI, 1989); Gelbe Plattenkalke der Kellerwand (KREUTZER, 1990).

Lithology: Yellow tentaculite limestone with bioclastic layers.

Fossils: Bivalves, brachiopods, conodonts, corals, echinoderms, ostracods, nautiloids, tentaculites (dacryoconarids; KREUTZER, 1992b: p. 28), trilobites.

Origin, facies: Marine limestone; following KREUTZER (1992a) the depositional environment corresponds with the Transitional Facies.

Chronostratigraphic age: Pragian–lower Emsian.

Biostratigraphy: *serotinus* and *patulus* conodont zones (KREUTZER, 1990).

Thickness: 145 m.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Rauchkofel Limestone (conformable contact).

Overlying unit(s): Vinz Limestone (conformable contact).

Lateral unit(s): Hohe Warte Limestone, Seewarte Limestone, Findenig Limestone.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: SCHÖNLAUB & HISTON (2000), HUBMANN et al. (2003).

Findenig-Kalk / Findenig Limestone

THOMAS J. SUTTNER, ERIKA KIDO

Validity: Invalid; limestone deposits of Mount Findenig are well studied by PÖLSLER (1969a); facies analysis of Findenig Limestone is provided from Oberbuchach and Findenigkofel by SCHÖNLAUB (1985b: p. 357) and SCHÖNLAUB et al. (2004: p. 24); a summary of the unit is given by KREUTZER (1992b: p. 28).

Type area: ÖK50-UTM, map sheets 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3111 Spittal an der Drau, 3116 Sonnenalpe Naßfeld, 3117 Nötsch im Gailtal (ÖK50-BMN, map sheets 197 Kötschach, 198 Weißbriach, 199 Herma-gor).

Type section: -

Reference section(s): Mount Findenig (N 46°35'42" / E 13°06'14"), Rauchkofel Boden section, Valentintörl section, Oberbuchach II, Hoher Trieb, Seekopf, Monte Zermula (see VAI, 1980: p. 80; SCHÖNLAUB, 1985b: p. 357; SCHÖNLAUB et al., 2004: p. 24, 28).

Derivation of name: After Mount Findenig.

Synonyms: Grauer und rother Kramenzelkalk (FRECH, 1894b: p. 227); fleischrote oder lichtgraue, plattige Netzkalke (GEYER, 1903); graue und rote Netzkalke (SPITZ, 1909); Devonischer Netzkalk mit Goniatiten (GAERTNER, 1931); Netzkalke mit Goniatiten (HABERFELNER & HERITSCH, 1932b); 'Roter Flaser- und Knollenkalk' (BANDEL, 1974: p. 96); reddish nodular limestone (SCHÖNLAUB, 1980b).

Lithology: Red flaser and nodular limestone (HUBMANN et al., 2003: p. 34).

Fossils: Cephalopods, conodonts, foraminifers, ostracods, tentaculites (dacryoconarids; SCHÖNLAUB et al., 2004: p. 53).

Origin, facies: Marine limestone, pelagic unit (Pelagic Carbonate Facies).

Chronostratigraphic age: Pragian–Emsian.

Biostratigraphy: *serratus* and *kitabicus* conodont zones (PÖLSLER, 1969b).

Thickness: 40–60 m.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Boden Limestone (conformable contact), Nöbling Formation (conformable contact), Middle and Upper Bischofalm Shale (conformable contact).

Overlying unit(s): Hohe Trieb Formation (conformable contact), Valentin Limestone (conformable contact).

Lateral unit(s): Kellerwand Limestone, Vinz Limestone, Zollner Formation.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: PÖLSLER (1969b), BANDEL & BECKER (1975), RANTITSCH (1992a), FERRETTI et al. (1999), HISTON et al. (1999), SCHÖNLAUB & HISTON (2000).

Zollner-Formation / Zollner Formation

THOMAS J. SUTTNER, ERIKA KIDO

Validity: Valid (SCHÖNLAUB, 1985a: p. 44); detailed facies description by SCHÖNLAUB & HISTON (2000) and SCHÖNLAUB et al. (2004).

Type area: ÖK50-UTM, map sheets 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3111 Spittal an der Drau, 3116 Sonnenalpe Naßfeld, 3117 Nötsch im Gailtal (ÖK50-BMN, map sheets 197 Kötschach, 198 Weißbriach, 199 Herma-gor).

Type section: Section near Lake Zollner (N 46°36'18" / E 13°04'11").

Reference section(s): Gundesheim Alm road (Oberbuchach section), Findenig, Hoher Trieb, southern side of Hohe Warte, Dellach Alm, Kronhof- and Nöblinggraben (SCHÖNLAUB, 1969a).

Derivation of name: After Lake Zollner (SCHÖNLAUB, 1985a: p. 78).

Synonyms: -

Lithology: Greyish green lydites and siliceous shales.

Fossils: Conodonts, radiolarians (SCHÖNLAUB, 1985a: p. 44).

Origin, facies: Marine, pelagic unit (Distal Siliciclastic Facies).

Chronostratigraphic age: Lochkovian–Tournaisian (regarding to the age constraint, the reader is referred to SCHÖNLAUB & HISTON, 2000: p. 23 and SCHÖNLAUB et al., 2004).

Biostratigraphy: -

Thickness: > 100 m.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Middle and Upper Bischofalm Shale (conformable contact).

Overlying unit(s): Hochwipfel Formation (unconformable contact).

Lateral unit(s): Findenig Limestone, Valentin Limestone, Pal Limestone, Kronhof Limestone.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: SCHÖNLAUB (1969a, 1991), HERZOG (1988), VAI (1998), SCHÖNLAUB & HISTON (1999), MADER & NEUBAUER (2004), VENTURINI (2006).

Seewarte-Kalk / Seewarte Limestone

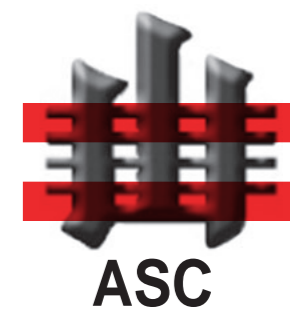
THOMAS J. SUTTNER, ERIKA KIDO

Validity: Invalid; first mentioned by STACHE (1884); the diverse gastropod fauna of this unit was first observed in the rubble of the Seewarte by SPITZ (1907); detailed description is given by KREUTZER (1990: p. 295); later included within the summary of the Variscan carbonate sequences in the Carnic Alps (KREUTZER, 1992b: p. 28).

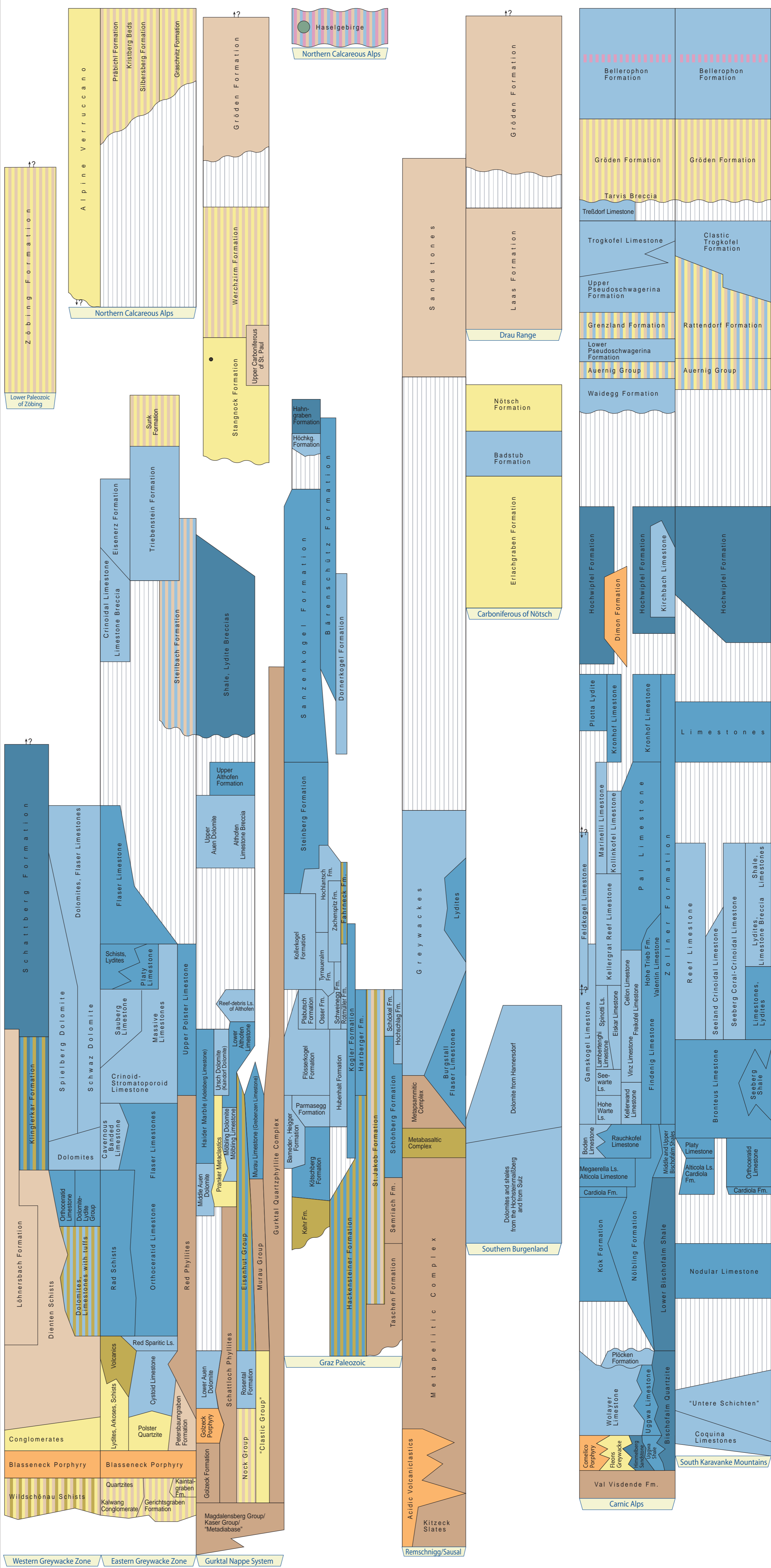
Austrian Stratigraphic Chart 2004 - Paleozoic

(sedimentary successions)

Austrian Stratigraphic Commission



ERA	SYSTEM / PERIOD / SERIES / EPOCH	STAGE / AGE	DURATION Ma	Global Classification					
				ERATHM / ERA	SYSTEM / PERIOD / SERIES / EPOCH				
PALEOZOIC	PERMIAN	CHANGHSINGIAN / Dorashanian	251	PERMIAN	MID PERMIAN / GUADALUPIAN				
		WUCHIAPINGIAN / Dufallian	255						
		CAPITANIAN	260						
		WORDIAN	265						
		ROADIAN	270						
		PERMIAN	LOWER PERMIAN / CISURALIAN			KUNGURIAN	275		
						ARTINSKIAN	280		
						SAKMARIAN	285		
						ASSELIAN	290		
		PERMIAN	UPPER PERMIAN / CARBONIFEROUS			GZHELIAN	295	PERMIAN	LOWER PERMIAN / CISURALIAN
KASIMOVIAN	300								
MOSKOVIAN	305								
BASHKIRIAN	310								
PERMIAN	UPPER PERMIAN / CARBONIFEROUS			SERPUKHOVIAN	315				
				VISEAN	320				
					325				
PERMIAN	LOWER PERMIAN / MISSISSIPPIAN			TOURNAISIAN	330	PERMIAN	LOWER PERMIAN / MISSISSIPPIAN		
				335					
				340					
		345							
		350							
		355							
		359.2							
		365							
		370							
		375							
PERMIAN	UPPER DEVONIAN	FAMENNIAN	380	PERMIAN	UPPER DEVONIAN				
		FRASNIAN	385						
		GIVETIAN	390						
		EIFELIAN	395						
		DEVONIAN	LOWER DEVONIAN			EMSIAN	400		
						405			
		PRAGIAN	410						
		LOCHKOVIAN	415						
		PERMIAN	LOWER DEVONIAN			LUDFORDIAN	420	PERMIAN	LOWER DEVONIAN
						GORSTIAN	425		
HOMERIAN	430								
SHEINWOOD	435								
TELYCHIAN	440								
AERONIAN	443.7								
RHUDDANIAN	445								
HIRNANTIAN	447								
PERMIAN	UPPER ORDOVICIAN			450	PERMIAN	UPPER ORDOVICIAN			
				455					
		460							
		465							
		470							
		475							
		480							
		485							
		488.3							
		490							
PERMIAN	UPPER CAMBRIAN	495	PERMIAN	UPPER CAMBRIAN					
		500							
		505							
		510							
		515							
		520							
		525							
		530							
		535							
		540							
PERMIAN	LOWER CAMBRIAN	542	PERMIAN	LOWER CAMBRIAN					
		544							
		546							
		548							
		550							
		552							
		554							
		556							
		558							
		560							



- Legend**
- pelagic, offshore, siliciclastic
 - pelagic, nearshore, calcareous
 - shallow marin, neritic
 - terrestrial-continental, coarse clastic
 - terrestrial-continental, fine clastic
 - evaporite (chloride, sulphate)
 - rhyolite, dacite
 - (basaltic) andesite, trachyandesite
 - basalt
 - phyllite
 - mixed-facies (in corresponding colors)
 - coal (may include several seams)
 - ? position/age doubtful/controversial
 - | equal units
 - \ older unit left \ younger unit right
 - hiatus
 - unconformity
 - GSSP
 - Fm. Formation
 - Ls. Limestone

© Commission for the Paleontological and Stratigraphical Research of Austria (CPSA) of the Austrian Academy of Sciences and Austrian Stratigraphic Commission

Cutout and English adaptation of the "Die Stratigraphische Tabelle von Österreich 2004": Geological Survey of Austria

The Austrian Stratigraphic Chart 2004 - Paleozoic is a supplement of:
 Hubmann, B., Ebner, F., Ferretti, A., Kido, E., Krainer, K., Neubauer, F., Schönlaub, H.-P. & Suttner, T.J. (2014): The Paleozoic Era (them), 2nd edition. - In: Piller, W.E. (Ed.): The lithostratigraphic units of the Austrian Stratigraphic Chart 2004 (sedimentary successions) - Vol. 1 - Abhandlungen der Geologischen Bundesanstalt, 66, 9-133, Wien.

Printing: Grasl Druck & Neue Medien GmbH, Bad Vöslau 2014