Tunnel heading largely confirmed the geological model as previously investigated. Large sandstone bodies indicate NNW-SSE trending fluvial or tidal channels. Several normal faults were encountered during excavation, but caused no severe geotechnical challenges. The fault pattern reveals a “Horst-Graben”-structure with extension mainly in WSW to ENE direction. Geotechnical challenges of the two lots were mainly linked to two areas with low overburden, which were successfully crossed with the help of grouted pipe umbrellas. Additional challenges were posed by water-bearing sandstone layers, especially in the descending tunnel heading of lot KAT2.

Acknowledgement: The ÖBB Infrastruktur AG (Mag. Ing. Gerhard Harer) is gratefully thanked for permission to present data from the excavation of the Koralm Tunnel.

Geological characterization and genetic aspects of the Mafengzhen magnesite deposit (Haicheng , Liaoning Province, NE China)

PLUCH, H., MALI, H. & EBNER, F.
Montanuniversität Leoben, Department Angewandte Geowissenschaften und Geophysik, Peter Tunnerstr. 5, A- 8700 Leoben

The Mafengzhen magnesite deposit near Haicheng (Liaoning Province, NE China) is part of the Yingke magnesite ore belt with numerous giant magnesite and talc deposits. This ore belt consists of early Proterozoic metamorphic rock series of Mg-rich carbonate formations which occure stratabound in the upper part of the Dashiqiao Formation of the Liaohe Group. The magnesite ore bodies are distributed in a large area, with extensions over 100 km in length and a width of 4 km in the eastern Liaoning Province. In case of the Mafengzhen deposit the ore body trends mostly towards NE. It is underlain by micaschists and concordantly alternating with thinly bedded dolomitic marble host rocks. The ore display metasomatic transitions and intergrowths with the dolomite host rocks and sometimes the ore is interbedded with siliceous green marble. In the late Jurassic lamprophyre dyke swarms intruded the magnesite deposit. Further the deposit is crosscut by faults including evidently younger magnesite sinter. The typical ore minerals of this deposit are magnesite and associated talc, Mg-chlorite, diopside, pyrite, graphite and others. The average geochemistry of the selective mined magnesite is MgO 46.89 wt. %, CaO 0.93 wt. %, SiO_2 0.99 wt. %, Fe_2O_3 (total) 0,44 wt. % and the LOI 50.78 wt. %.
A detailed geological and geochemical study was conducted of the Mafengzhen magnesite deposit to elucidate the genesis of the magnesite in the Yingke ore belt. The observed features and geochemistry indicate a multiply sedimentary to diagenetic magnesite formation.

Deep geo(hydro)thermal potential in Vorarlberg

POMELLA , H.,[1] ORTNER, H., [1] ZERLAUTH, M.,[1,2] & FÜGENSCHUH, B.[1]
[1] Institut für Geologie und Paläontologiw, Universität Innsbruck; Innrain 52, 6020 Innsbruck
[2] alpS GmbH; Grabenweg 68, 6020 Innsbruck

In the context of the planned Energy Autonomy of Vorarlberg and in collaboration with the Illwerke-Alternativenergie GmbH and the alpS GmbH Centre for Climate Change Adaptation Technologies, the geothermal potential of Vorarlberg is investigated. In the following the two most promising geological settings are discussed.
In the Alpine foreland of westernmost Austria, near Lake Constance, the autochthonous Mesozoic sediments are situated in an attainable depth of 4 to 4.5 km below the ground surface. As the limestone occurs in a distal facies and no intense karstification is known (Jodocy and Stober, 2009), the best prospects for a considerable permeability are expected in the damage zone of major fault structures. Near Bregenz a favourable structure has been detected in seismic sections. The most promising approach to determine the exact position and orientation of the structure, as well as for further characterization of the damage zone is 3D seismics, as has been recently shown by the nearby project run by the city of St. Gallen.
According to seismic data in southern Vorarlberg, the base of the Helvetic nappe stack is located at ~4.5 km below the ground surface. Within the Helvetic nappes, several formations have a high hydrothermal potential, especially when fractured due to folding or faulting. The Cretaceous Helvetic units are characterised by folding

while the thicker Jurassic Quinten limestone is additionally stacked on N-NNW directed thrust faults and occurs in the form of isolated blocks embedded in more incompetent clay-rich basin deposits. The interpreted seismic sections indicate a lateral extend of these bodies of up to some kilometres, but further explorations are necessary in order to clearly identify blocks suitable to provide a deep aquifer of appropriate volume.

Jodocy, M., Stober, I., 2009. Geologic-geothermal cross-sections through the southwestern part of the Molasse Basin (South Germany) Zeitschrift der Deutschen Gesellschaft für Geowissenschaften 160, 359-366.

Morphometric analysis of a reactivated Variscan fault of the Budjovice basin, Czech Republic

POPOTNIG, A., HOMOLOVÁ, D. & DECKER, K.
Department of Geodynamics and Sedimentology, University of Vienna, Althanstraße 14, 1090 Vienna, Austria

The Budjovice Basin in southern Bohemia with its up to 340 m thick Cretaceous to Neogene sediments is overlying the hangingwall of the Hluboká and the Rudolfov Fault. This late Variscan NW-SE striking and NNE-SSW striking faults were repeatedly re-activated in Mesozoic, Miocene and Pliocene times and form the NE and SE margin of the basin.
Geomorphologic analyses mainly focus on mountain fronts at Radice Mountain which cross the Hluboká Fault and the NE facing slope which is not crossing the fault as well as on the slope SE of the basin which crosses the Rudolfov Fault. We used several geomorphic parameters to investigate small tributaries of the Vltava River which cut into crystalline basement units and are similar in hydrological conditions and the common base level formed by the Vltava River.
Our results indicate that the hillslope following the Hluboká Fault is a very straight mountain-piedmont junction in the vicinity of the fault and an uplift influenced morphology. Almost all values are significantly different than those observed at the other mountain slopes. Convex-up thalweg sections of this slope show marked single large knickpoints close to the fault.
The results along the slope at the NNE facing side of Radice Mountain and the slope crossing the Rudolfov Fault are not different to each other but still show results which may be classified as moderate tectonic active. Thalweg sections show profiles of concave passing into convex as well as concave-convex profiles

Ein Querschnitt Waschbergzone - Korneuburger Becken - Flyschzone - Nördliches Wiener Becken im Bereich der Gasleitung WAG II

POSCH-TRÖZMÜLLER, G., ROETZEL, R., PERESSON, M., CORIC, S. & GEBHARDT, H.
Geologische Bundesanstalt, Neulinggasse 38, 1030 Wien

Von September bis November 2011 wurde der Abschnitt Enzersfeld - Sierndorf der WAG II-Gasleitung der OMV/ GAS CONNECT AUSTRIA errichtet. Die Bauarbeiten ermöglichten einen einmaligen und zum Teil spektakulären Querschnitt durch Waschbergzone und Flyschzone inklusive Korneuburger Becken bis ins nördliche Wiener Becken hinein. Durch die Künette wurden die oberen 2-3 Meter erschlossen, stellenweise auch tiefere Schichten. Folgende strukturelle und stratigraphische Einheiten konnten dabei von West nach Ost detailliert dokumentiert werden:
- In der Waschbergzone, der Fortsetzung der allochthonen Molasse nördlich der Donau, wurden die – „Schiefrigen“ Tonmergel (Eggenburgium bis Ottnangium) angetroffen, in die „Blockschichten“ (Debrite) eingeschaltet sind. In der westlich vorgelagerten Roseldorf-Zone konnten die „Eisenschüssigen Tone und Sande“ dokumentiert werden, die mit der Krepice-Formation (Ottnangium) in der Pausramer Einheit parallelisiert werden können.
- Im Korneuburger Becken, einem Halbgraben innerhalb der Flyschzone, wurden überwiegend nach Westen einfallende Tone, Silte und Sande der Korneuburg-Fm. (Karpatium) angetroffen.
- Die Flyschzone ist im Bereich der Pipeline durch die Greifensteiner Decke vertreten. Die Greifenstein-Fm. (Paläogen) besteht hier aus dickbankigen Folgen von Sand- bis Tonsteinen.
- Im nördlichen Wiener Becken wurden durch die Gasleitung am westlichen Beckenrand Sedimente des Badenium (Feinsande und Silte) aufgeschlossen.
- Quartäre Sedimente bilden in allen Einheiten den Abschluss der Schichtenfolge: Kiese und Sande der Älteren und Jüngeren Deckenschotter, der Hochterrasse, sowie unterschiedlich mächtige Löss- bzw.