



Economic Geology – Project Generation – Mineral Exploration – Due Diligence – Mine Assessment – Hydrogeology

Thomas Krassmann, Ph.D. M.Sc.
EurGeol Qualified Person Consulting Geologist

D - 91438 Bad Windsheim / Germany
Tel./Fax 0049 - (0) 9841- 7302 Email: tkrassmann(at)hotmail.com

List of References as of October 2016

A) References Economic Geology, Mineral Resources & Mining :

2016 :

- Maiden assessment of gold and copper deposits in Kayseri – Kahramanmaras area, Central Anatolia, Turkey
- Procurement of historic zinc ore samples and detailed mineralogical description including ore microscopy of lead – zinc ores in the Ruhr area / Ruhrgebiet as part of a research program of the German Geological Survey / BGR in Hanover.
- Economic geology field trip to the “Golden Quadrangle” in the Apuseni Mountains and the polymetallic deposits of Baia Mare area / Maramures in Romania
- Continent wide desk top study on talc potentials of 48 African countries for a major mineral filler company
- Assessment of huntite and antimony deposits in Western Anatolia, Turkey

2015 :

- Assessment of a Quartz deposit in British Columbia, Canada
- Valuation of a ceramic clay deposit near Regensburg, Bavaria
- Reconnaissance of Zinc – Lead Potential in the Western Harz Mountains, Northern Germany
- Planning, Organisation und Execution of a diamond exploration program in Southwestern Europe

2014 :

- Short Study on current global tin and antimony supply situation for private client
- Assessment of a major wollastonite deposit at Aroche, Andalucia, Spain
- Desk Top Study on barite potentials in Turkey, Egypt, Jordan, Morocco and Greece
- Consulting on the economic potential for limestone deposits in the Ndola area, Copperbelt, Zambia
- Evaluation of copper – gold deposits and smelter slags in Albania



Economic Geology, Mineral Resources & Mining (continued) :

2013 :

- Study on REE – Potential of phosphogypsum – dumps in Middle Europe
- Assessment of a giant graphite deposit in Lindi region, Southern Tanzania
- Due Diligence on several copper deposits in the Sultanate of Oman
- Exploration for kimberlites with diamond potential in Southern Spain

2012 :

- Prospection and reconnaissance on hydrothermal lead – zinc deposits in the Ruhr area, Germany
- Reservoir assessment of the Lüdersfeld methane deposit, Lower Saxony, Germany
- Major country wide assessment of the mining sector, mineral potential and mineral development potential of the Sultanate of Oman
- Reconnaissance of two potential REE – Mineralisations in Eastern Germany

2011 :

- Prospecting and assessment for economic scandium mineralisation in Eastern Bavaria, Saxony and the Czech Republic.
- Due Diligence of the Springer tungsten mine property, Nevada
- Appraisal of the current status of Uis and Neineis tin mines, Namibia for DRAG
- Preliminary assessment of the Mertens copper mine, Rehoboth, Namibia
- Field visit of Aljustrel and Neves Corvo polymetallic deposits, Portugal

2010 :

- Exploration for an underground blasting chamber for explosion clad metal production in Belgium, France and Switzerland for Dynaplasts
- Prospection and evaluation of a prospective gold – copper deposit, Hungary
- Due Diligence / Assessment of Antimony Deposits in the Halong area, Vietnam
- Prospection of marble deposits in Central Namibia
- Study on flooding behaviour and rock stability in the Kropfmühl graphite mine, Bavaria
- Reconnaissance field visits of massive sulphide deposits in Southern Cyprus



Economic Geology, Mineral Resources & Mining (continued) :

2009 :

- Exploration for an underground blasting chamber for explosion clad metal production in Germany for Dynaplats
- Global study on flat ore reefs / ore horizons for a leading German mining equipment company,
- Evaluation of an extensive manganese shale deposit in the Northern Austrian Alps
- Desk Top study of the high grade REE deposit Steenkampskraal in Namaqualand, RSA
- Assessment of a potential REE deposit near Trujillo, Northern Peru
- Reconnaissance study on the use of the Kohnstein and Döhlau Gypsum mines as underground blasting chambers for Dynaplats

2008 :

- Evaluation of potentially economic gold projects in the Czech Republic, Slovakia and Hungary,
- Assessment of the copper, gold and sulphuric acid potential of northern Cyprus
- Project Generation : Assessment of multielement Noble and Base Metal potential (gold, silver, platinum, nickel, cobalt, tungsten) in Germany and Austria
- Prospection for synsedimentary fluorspar mineralization in Hessen, Germany
- Global study on economics and target generation for tungsten, molybdenum and ferro-vanadium deposits
- Identification of aggregate resources in Germany and Finland, 2008 - 2010
- Experts opinion on the viability of Armenian chromite deposits
- Organisation and management of a full scale gold exploration program in Eastern Bavaria at Gütting, Unterlangau for Deutsche Rohstoff AG

2007 :

- Assessment / Research of the giant Pebble Porphyry Copper Project, Alaska
- Project Generation : Assessment of 15 European base metal deposits for further exploration work for Deutsche Rohstoff AG
- Assessment of potentially economic gold deposits in the Czech Republic, Slovakia und Hungary
- Assessment of economics of the Namibian mining company Weatherly Plc
- Project Generation : Assessment of various industrial mineral deposits (quartz, feldspar, garnet, soda ash) for future exploitation for Wolf & Müller
- Due Diligence of a north Mexican coal exploration project at Monclova for a German investment company



Economic Geology, Mineral Resources & Mining (continued) :

2006 :

- Full scale exploration program and evaluation for CBM - Coal Bed Methane resources in the Schaumburg coal field, Northern Germany, 2007 - 2010
- Analysis / Research of the investment potential of Pan African Mining operations for Dr. Kalliwoda Research
- Analysis / Due Diligence of the geological potential of Moto Goldmines, North Eastern - Congo

2005 :

- Evaluation of the mineral potential of borate and base metal deposits in Turkey
- Exploration for aquamarine gemstones and iron ores in the central Damaraland, Namibia,
- Study of market potential for Namibian marble fillers

2004 :

- Evaluation of amethyst and quartz deposits in western Turkey
- Exploration for mineable red granite ornamental stones deposits in Germany

2002 :

- Evaluation of travertine, gypsum and specularite iron ore pigment deposits in Central and Eastern Turkey
- Mapping and documentation of historic landslides in the vicinity of a newly developed gypsum underground mine Breitenstein near Bodenwerder, Weserbergland, 2003 - today

2001 :

- Prospection of aggregates / crushed rock resources in northern Germany
- Geological mapping, exploration and core logging of a potential limestone aggregate deposit close to Alfeld / Lower Saxony, 2001 - 2002

2000 :

- Market study on calcium carbonate fillers for Oppermann KG, Hedemünden
- Consulting and planning work on underground bituminous limestone mining at Eschershausen – Hils, Lower Saxony for DASAG, 2000 - 2001



Economic Geology, Mineral Resources and Mining (continued) :

1999 :

- Comprehensive study about the market potential, usages and economic geology of chalk filler deposits in northern Germany
- Due Diligence of a proposed remediation & backfill project of a former dolomite quarry in the Spessart area, Germany
- Market Study on the geology and economics of lapislazuli gemstones
- Evaluation of the mineral potential of Mount Malosa area and Kangankunde phosphate - REE carbonatite, Malawi
- Economic appraisal of blue lapislazuli mineral pigments in Zambia

1998 :

- Literature survey about the potential usage of bituminous limestones in waste disposal site construction
- Evaluation of the mineral potential of the DASAG - concession area in the Leinebergland, resulting in the definition and delineation of a 20 Million ton high grade carbonate deposit
- Research and evaluation of the geothermal potential of flooded mine shafts in Northern Germany for geothermal energy usage

1997 :

- Exploration for crushed rock / aggregates resources, Southern Lower Saxony

1996 :

- Geological consultancy on various exploration- and small mining projects (iron, copper, tourmaline) in the Solwezi area, Northern Zambia
- Development of a rehabilitation scheme for an underground limestone mine in Eschershausen, Lower Saxony, Northern Germany
- Investigation and development of sanitation proposals for an imminent landslide in a limestone quarry in the Weserbergland, Northern Germany

1994 – 1995 :

- Evaluation of several gemstone and precious metal deposits (emeralds, peridot, gold) in and developing of an exploration concept in South Eastern Egypt
- Detailed mapping and examination of abandoned underground asphalt mines and evaluation of mine subsidence risks in the Holzen Asphalt mines, Hils
- Desk Top Study / Literature survey about natural spinel deposits for use as refractories for Refratechnik GmbH
- Exploration and Documentation of a karst cave in Northeastern Ibiza, Balears, Spain



Economic Geology, Mineral Resources and Mining (continued) :

1988 :

- Detailed mapping of gold mineralisation in high metamorphic volcanosedimentary rocks on the Daheim prospect, southern Erongo foreland, Namibia
- Gold exploration program on gold quartz vein mineralisation on the Ondundu project, central Damaraland, Namibia

1986 :

- Resource interpretation of a major drilling program on pegmatitic tin - tantalum mineralisation at Uis tin mine, Namibia

1984 – 1985 :

- Detailed assessment of the geology and formation of the Helmstedt lignite basin, Lower Saxony, Germany (M.Sc. thesis)
- Detailed mapping of a part of the Coppengrave – Brunkensen – Hoyershausen area in the Hils with scientific research on the historic „Gute Hoffnung“ lead mine / mineralisation.

1982 :

- Exploration on gold - quartz vein mineralisation with detailed mapping, sampling, underground mine exploration etc. in high alpine terrain, Rauris Valley, Austria



B) References – Environmental Geology / Waste & Waste Site Remediation :

2015 :

- Evaluation and Potential Assessment of large historic copper slag dumps in the Mansfeld Area, Sachsen – Anhalt
- Valuation of potential landfill rehabilitation of a clay pit in Central Bavaria
- Assessment and Due Diligence of an innovative, environmentally friendly dust elimination system for open pit mines and quarries using biocementation

2014 :

- Assessment and management plan on mine waste water of the graphite mine at Kropfmühl, Bavaria

2013 :

- Environmental consulting of construction of a dinosaur park on a former WW II - ammunition factory, Central Bavaria

2009 :

- Evaluation of the retention potential of a potash mine dump near Hanover, Lower Saxony for hazardous organics and heavy metals

2007 :

- Exploration and Due Diligence of a CBM Methane Project in the Schaumburg Area, Lower Saxony, 2007 – 2009
- Assessment of iron ore and zinc potential from large iron smelter slag dumps in Upper Palatinate, Eastern Bavaria

2006 :

- Historical Research on Methane emissions from coal beds in the Schaumburg Area, Lower Saxony

2005 :

- 3D Immersive Photodocumentation of the "Kristallgrotte Merkers" with giant halite crystals, Merkers Potash Mine, Thuringia
- Development of a tourism marketing concept for the historic Silberberg Show Mine at Bodenmais, Bayerischer Wald, Bavaria
- Participation in a national Geological Heritage competition, with two proposed Geosites -- Silberberg Bodenmais and Wachsender Felsen Usterling – being awarded the title of "National Geosite of outstanding Beauty and Importance"



Environmental Geology / Waste & Waste Site Remediation (continued) :

2004 :

- 3D Immersive Photodocumentation of various World Heritage Sites in Turkey for the National Tourism Ministry of Turkey

2003 :

- Exploration and Documentation of historic underground sandstone mines in Ansbach, Bavaria

2000 :

- Detailed exploration and documentation of the historic underground Badewasserkanal monument in Bad Nauheim, Hessen

1999 :

- Detailed historical investigation of a II World War underground factory in Marienhagen, Hils area, 1999 - 2001
- Historical Research on fine coal dust emissions in the former Carolus Magnus colliery in Übach - Palenberg near Aachen
- Assessment and economic valuation of a landfill rehabilitation scheme of a large dolomite quarry in Hessen

1998 :

- Consulting on possible TNT - contaminated drainage systems in the Werk Tanne explosive factory area, Harz Mountains
- Literature survey and benefit study on the usage of bituminous limestones in waste disposal sites for DASAG / Eschershausen
- Fact-Finding and Assessment of wastewater purification potential of natural reed beds at Lake Titicaca, Peru for Kreditanstalt für Wiederaufbau / KfW
- Exploration and documentation of an underground cable and transport network on the HANOMAG factory in Hannover-Linden, Lower Saxony

1996 :

- Detailed exploration of underground workings and transport channels below the LHB factory in Salzgitter, Lower Saxony, 1996 – 1997
- Exploration and environmental risk assessment of landfills at the Kurhessenkaserne, Hannoversch Münden, Lower Saxony



Environmental Geology / Waste & Waste Site Remediation (continued) :

1995 :

- Detailed historical research and exploration of a historic underground structure on the upper part of the Kurhessenkaserne in Hannoversch – Münden, Lower Saxony, 1995 - 1997
- Planning and conceptual design of a reed bed waste water treatment plant for Hemeln village, Lower Saxony

1994 :

- Detailed investigation and environmental risk assessment of a former ammunition factory at Carlshütte – Delligsen, Northern Germany, 1994 - 1995
- Drilling and ecological risk assessment of former sludge ponds in Salzgitter - Lebenstedt

1993 :

- Major historical research of the Salzgitter mining industrial area as part of investigations of a local cancer cluster.
- Testing of short term and long term radon emanation/strain of local inhabitants of Salzgitter - Heerte as part of the research project on local cancer clusters
- Exploration of various mine adits / underground structures near the Carlshütte Delligsen as part of a major environmental risk assessment program, 1993 - 1994
- Detailed historical research of the ammunition factory Carlshütte Delligsen, Leinebergland, Lower Saxony, 1993 - 1994
- Detailed exploration and mapping of underground transport networks below a part of the Salzgitter smelter complex in Salzgitter-Watenstedt, Lower Saxony
- Planning of a rehabilitation scheme of the hazardous waste disposal site "Flüssigschadstoffdeponie Osterwiek" in Sachsen – Anhalt
- Major historical research on hazardous waste in the southern part of the Salzgitter smelter complex as part of research on a local cancer cluster in Salzgitter – Heerte
- Critical review and assessment of previous planning work on a landfill site near Holzminden

1991 - 1992 :

- Geological / geophysical assessment of hazardous waste contaminations in the vicinity of a landfill in Halberstadt County, Sachsen – Anhalt
- Environmental risk assessment of a hazardous CKW contamination on a railway station near Bremen, Northern Germany
- Detailed historical research of contamination hazards of a liquid waste disposal site near Magdeburg, Sachsen – Anhalt
- Literature survey / desk top study on land fill sealing systems



C) References – Hydrogeology :

2015 :

- Assessment of potential spa - usage of geothermal waters in the Sultanate of Oman

2014 :

- Hydrogeological Consulting on karst water aquifers in the Ndola Area, Zambia

2013 :

- Hydrological assessment of tailing ponds of the Kropfmühl graphite mine, Bavaria

2012 :

- Assessment of hot spring geothermal power potential in the Sultanate of Oman

2010 :

- Hydrogeological assessment of the flooding behaviour of the Kropfmühl graphite mine, Bavaria

2009 :

- Hydrogeological study of the Lüdersfeld methane gas field, Schaumburg Area
- Assessment of salt water flow within a potash dump and optimisation of adsorption systems near Hanover

2006 :

- Concept study on exploration and commercial extraction from submarine fresh water springs in karstic aquifers along the Mediterranean coasts (Spain, Italy, Greece, Croatia) using thermographic imagery

2003 :

- Hydrogeological investigation and assessment of a landslide area near Rühle, Weser

2001 :

- Evaluation of rain water drainage potential in the housing area "Am Johannishof" in Stadthagen

2000 :

- Risk assessment and exploration of the historic "Badewasserkanal" in Bad Nauheim spa, Hessen



C) Hydrogeology (continued) :

1999 :

- Planning and Reconstruction of an underground fresh water plant in an historic 80 meter deep mine shaft in the Bückeberge using SRT techniques
- Hydrogeological Assessment of soil permeability for a new housing area in Rinteln-Steinbergen
- Hydrogeological calculation of a flood protection scheme in Rodenberg, Lower Saxony
- Assessment of the hydrogeological potential of the Obernkirchen golf course and localisation of favourable drilling targets, successfully drilled later.

1998 :

- Evaluation of the fresh water potential of the former mining area of Altenau / Harz Mountains
- Fact Finding and Evaluation of the usage of large natural Titora – reed beds at Puno / Peru as waste water ponds with KFW

1997 :

- Potential assessment of geothermal mine water from historic coal mines in the Schaumburg area for EMR - Elektrizitätswerk Minden-Ravensberg, 1997 - 1998
- Hydrogeological consulting on soil drainage of precleaned waste water in Hellenthal – Ramscheid, Eifel, Rheinland - Pfalz
- Exploration and evaluation of mine drainage waters for use as communal fresh water, Stadthagen, Northern Germany

1996 :

- Assessment of soil water permeabilities in ten different construction areas in Southern Lower Saxony for decentral rainwater drainage; 1996 - 2002
- Examination and refurbishment of the historic Reinsen water adit for fresh water production
- Risk assessment and refurbishment of the Schierborner water adit for fresh water production, Samtgemeinde Nienstädt

1995 :

- Feasibility study for a reed bed waste water treatment scheme at Hemeln near Hannoversch Münden
- Analysis and reconstruction concept of a fresh water well in an former mine shaft at Obernkirchen, Lower Saxony including all necessary reconstruction work
- Feasibility study for renewed utilisation of water adits in the Bückeberge near Reinsen



C) Hydrogeology (continued) :

1994 :

- Drilling and investigation of soil drain capabilities for artificial wetlands / eco - waste water purification system in Lahstedt (approved as EXPO - project)
- Investigation of water biocontamination and development of a sanitation scheme at the Bernsen well site, Auetal community