MMI™ TECHNICAL BULLETINS

SGS regularly produces technical bulletins for MMI™ users. These bulletins contain important information on issues such as sampling procedures and problems, the application of MMI™ in various environments and research studies. They are aimed at providing MMI™ users with updated reports on new improvements, breakthroughs or changes to the MMI™ Technique.

Title	Technical Bulletin TB26: Weak Versus Strong Leachants (PDF 1.84 MB)
Date	December 2007
Overview	All wet chemical methods of dissolving a soil are a partial digestion – even those involving strong acids. The question is to what extent. It transpires that so-called weak extractions (because of their lack of attack on substrate) have some advantages over strong digests which attack and dissolve various soil phases. This technical bulletin explains what those advantages are, and gives a very clear comparison of the resolution of a VMS ore body under 35m of till at Cross Lake by various weak and strong extractants. It also explains why it is believed that MMI™ extraction provided greater resolution and contrast in this comparison than any other extractant or digestant (including aqua regia) used.
Title	Technical Bulletin TB24: Lithogeochemistry And MMI™-M (PDF 1.02 MB)
Date	October 2006
Overview	The behaviour of many rock forming elements is dictated by their ionic radius. Substitution in silicate (and other) mineral lattices is often on the basis of ionic radius. Substitution in silicate (and other) mineral lattices is often on the basis of ionic radius. For example, Pb(II) and Ag(I), commonly very closely associated in some ores, have very similar (large) ionic radii, 1.26Å and 1.2Å respectively. Elements common in core magmas such as Fe and Ni have divalent cations with ionic radii in the range 0.6 - 0.8Å. Elements in the periodic table with ionic radii between 0.5 and 1Å are considered "compatible" and substitute or are incorporated into crystallising silicates in early rock formation. Elements with ionic radii greater than 1 are less commonly substituted, remain behind in residual fluids and are considered "incompatible".
Title	Technical Bulletin TB20: The Use of MMI™ Ni and Ce for Inferred Geology (PDF 561.26 KB)
Date	March 2006
Overview	The Yilgarn Craton of Western Australia is characterized by a number of "greenstone" belts comprising metamorphosed mafic and ultramafic sequences separated by granitic terrains of slightly younger age. As such the distribution of two elements Ni and Ce is of considerable assistance in delineating geology, particularly as outcrop is often limited and where present is subdued by the extent of weathering.
Title	Technical Bulletin TB19: MMI™ Orientation Surveys in Non Boreal Terrains (PDF 168.42 KB)
Date	March 2006
Overview	MMI™-M - A multi element suite selected from the leach list is recommended initially for orientations. This approach has provided very useful information in not only pin-pointing target element responses but also providing information on structure, alteration and mineralization halos and lithological setting. e.g. Porphyry Systems: Cu, Mo, Zn, Cd, Au, Ag, Pb, Co, As, Y, Ce, Nd, Rb, La, Se, W, Fe, Mg Kimberlite Targets: Cr, Ni, Pd, Mg, Co, Nb, Y La, Ce, Nd, IOGC Targets: Cu, Au, Ag, U, Th, Co, Ce, La, Mg, Fe,
Title	Technical Bulletin TB18: Rare Earths and MMI™ Geochemistry (PDF 2.44 MB)
Date	December 2005
Overview	Rare earth elements appear commonly and strongly in partial digestions from a wide range of "unexpected" mineral deposit styles and geological assemblages - komatiitic nickel sulphides, vein-type Au deposits, and kimberlites for example. Rare earths commonly are thought of as being associated with felsic and granitic rocks and carbonatite mineralization. Soils over these rock types exhibit concentrations of rare earths commonly of the order of hundreds of ppb in MMI™ digestions.

Title	Technical Bulletin TB17: MMI Geochemistry for Nickel Exploration (PDF 983.44 KB)
Date	November 2005
Overview	The geological understanding of nickel sulphide deposits, particularly those of the komatiite-type, has undergone vast changes in recent years. Sampling density is of special importance in Ni exploration using any geochemical technique. Techniques such as MMI may have an advantage, particularly in the latter stages of exploration because of their superior spatial resolution (due to less extensive surface re-working) compared to conventional techniques.
Title	Technical Bulletin TB06: The Application of MMI Geochemistry in Deeply Weathered Lateritic Environments (PDF 296.59 KB)
Date	June 1998
Overview	The MMI™ Technique has been successfully applied in numerous countries in areas with deeply weathered lateritic profiles. This bulletin looks at several case studies and discusses the implications for surface exploration geochemistry in lateritic terrain, both in arid and tropical environments.
Title	Technical Bulletin TB05: The Application of MMI™ Geochemistry in Tropical and High Rainfall Environments (PDF 1.25 MB)
Date	November 1997
Overview	A brief look at the effectiveness of the MMI™ Technique in tropical environments where high rainfall and organically rich soils are common. The bulletin draws on the case studies available on the web site as well as orientation studies conducted during research projects.

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