



## CLINTON P. SMYTH, Pr. Nat. Sci.; P.Geo.

### CURRICULUM VITAE

Clinton Smyth gained more than 25 years of experience in minerals exploration, resource evaluation and mining with one of the largest mining companies in the world. He began his career as a De Beers Consolidated Mines student in 1974, moving to the Anglo American Corporation of South Africa in 1978. He served Anglo American in diverse roles throughout Africa and Australasia until early 2000, when, as an Anglo American Vice President of Exploration, he resigned to establish Georeference Online Ltd (GOL) in Canada. GOL provides consulting services to the minerals exploration and mining industries and develops software applications for mineral exploration and the earth sciences in general. Clinton serves on the boards of various public and private companies.

Clinton is an experienced geochemist, explorationist, software developer, and corporate manager.

#### Professional Qualifications

*Education* MSc. (Computing) Imperial College, London (1985)  
MSc. (Geochemistry) University of Cape Town (1983)  
BSc. (Hons) (Geochemistry) University of Cape Town (1977)

*Registration:* Pr. Sci. Nat (South Africa); P.Geo. (British Columbia)

*Citizenship:* Canadian; South African

*Languages:* Fluent in English and Afrikaans; Working knowledge of Spanish and French

*Member:* Society of Economic Geologists; Geological Society of South Africa  
Geological Association of Canada; Society of Exploration Geochemists

#### Georeference Online Ltd.

#### Vancouver (September 2000 - Present)

##### Founder and President

- Co-Founder & Executive Chairman of Raye Resources Inc ([www.rayeresources.com](http://www.rayeresources.com))
- Manager of exploration for Antofagasta PLC on the [Redton property](#). (Jun 2021 to Mar 2024)
- CTO of Minerva Intelligence Inc. (October 2019 to October 2021)
- CEO of Minerva Intelligence Inc. (June 2017 to October 2019)
- Consultant on international minerals exploration targeting and execution, resource evaluation and due diligence / 43-101 reporting.
- Co-Founder and President of [Georeference Online Ltd](#) (November 2000 to present)
- Director of Alba Minerals Ltd. (January 2016 to February, 2018)
- Exploration Manager for three privately-funded companies exploring for gold, copper and molybdenum in British Columbia:
  - LCT Holdings Ltd (2005 to present) ([www.bigbulk.com](http://www.bigbulk.com))
  - Redton Resources Ltd (2005 to present) ([www.redton.com](http://www.redton.com))
  - New Chris Minerals Ltd (2011 to 2016) (purchased by GT Gold, then by [Newmont](#))
- President of Dolly Varden Resources Inc. (now [Dolly Varden Silver Corp](#)) from 2010 to 2016, responsible for the sale of the company's BC silver mines and Alberta oil sands assets.
- Vice President (Exploration) for Pasinex Resources Limited ([www.pasinex.com](http://www.pasinex.com)) from November 2011 to January 2016, managing zinc and copper exploration in Turkey, as well as geological aspects of the Pinargozu zinc-oxide mine in Adana Province – a Pasinex JV with Akmetal.
- Vice President (Exploration) for Miocene Metals Ltd (TSX-V), managing exploration of their portfolio of seven properties in south-western British Columbia (June 2010 to February 2011).



- President of Target Geological Inc., a project-specific private company established to execute AngloGold Ashanti's drilling project on Dolly Varden Resources Inc.'s Big Bulk Gold Copper Porphyry Prospect (July 2009 to January, 2010).
- Vice President (Exploration) for Durango Capital Corp, managing the company's Hastings Gold Project in north-western British Columbia (April 2007 to April 2009)
- Vice President (Exploration) for Dome Ventures Corporation (April 2005 to March 2007), responsible for the company's exploration in China, Papua New Guinea, Nigeria and Gabon.
- Commercialised the **CampControl** software system for Internet-based management of minerals exploration ([www.campcontrol.com](http://www.campcontrol.com))
- In 2005, staked and arranged financing for the Redton ([www.redton.com](http://www.redton.com)) and Kinskuch and Big Bulk ([www.bigbulk.com](http://www.bigbulk.com)) exploration properties in British Columbia. The ~600 square kilometer Kinskuch property was sold to Hecla Mining in 2016.
- Developed the **MineMatch**<sup>®</sup> software system for the standardised description and comparison, for minerals exploration targeting purposes, of mineral deposits and mineral deposit models. MineMatch and associated software and IP was sold to Minerva Intelligence in 2017.
- Developed the **LegendBurster** software system for mapping complex objects using semantic network descriptions in an ArcGIS environment (sold to Minerva Intelligence in 2017).
- Consultant on knowledge representation and reasoning in the earth sciences to the NSF-funded GEON program in the USA.
- Consultant to the Geological Survey of Canada on knowledge representation and reasoning.

**SIGNIFICANT Georeference Online Ltd SOFTWARE PROJECTS:**

- Created the Yukon Mineral Targets internet application for the Yukon Geological Survey (sold to Minerva Intelligence in 2017).
- Managed the "[MineMatch Geochemistry](#)" project in the British Columbia government's "Rocks to Riches" program. This was an Internet-delivered project to stimulate investment in minerals exploration in BC. It relied on the integration of state-of-the-art knowledge representation and reasoning software with the province's earth science databases to deliver GIS-based mineral exploration targets on the Internet.
- Managed, for the Geological survey of Canada, development of a prototype ontology- and knowledge-based system for the description and comparison of landslides.
- Managed, for GeoConnections, the project entitled "[Enabling Semantic Interoperability between Mineral Deposit Descriptions from Different Provincial Databases](#)". The purpose of the project was to demonstrate how semantic interoperability between Canada's provincial mineral occurrence databases may be achieved, and the advantages this interoperability offers.

**Anglo American  
Corporation of  
South Africa**

**Johannesburg (Aug 1999 to Feb 2000)**

**Vice President (Exploration) responsible for all Advanced Projects in Africa**

*During this period, responsible for all geological aspects of the following projects or mines:*

**ZINC**

- **Skorpion Oxide Zinc Feasibility Study, Namibia; Gamsberg Sulphide Zinc Feasibility Study, South Africa; Black Mountain Pb/Zn/Ag Mine Depth Extension Feasibility Study, South Africa.**

**COPPER**

- **Nchanga and Konkola Mines, Zambia**  
Responsible for geological aspects of Anglo's buy-back into the Zambian Copperbelt.

**MINERAL  
SANDS**

- **Namakwa Sands Mine, South Africa**  
Geological input into the 4MTPA to 8MTPA scale-up of the ilmenite, rutile, zircon mine.



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<b>NICKEL</b>	<ul style="list-style-type: none"> <li><i>Phoenix Nickel Mine, Botswana</i> Anglo's geological input to the feasibility study on upgrading the open pit sulphide mine's magnetic separation facilities to floatation &amp; SX/EW technology.</li> </ul>
<b>Minorco</b> <i>Seconded from Anglo American</i>	<p style="text-align: center;"><b><u>Singapore (1996 - 1999)</u></b></p> <p style="text-align: center;"><b>Consulting Geologist<sup>1</sup> responsible for all Exploration in Australasia</b></p>
<b>AUSTRALIA</b>	<ul style="list-style-type: none"> <li>Briefed to establish for Minorco, from scratch, minerals exploration operations for gold and base metals, as well as project evaluation capabilities, in the Australasian region. Reported to Minorco's Managing Director (Australasia) in Singapore and Minorco's Head of Exploration in London. Annual budget of around US\$8 million and a staff which peaked at around 100.</li> </ul>
<b>PHILIPPINES</b>	<ul style="list-style-type: none"> <li>After negotiation of one of the first now-popular major-junior strategic alliances with Goldstream Mining Limited, established an active exploration office in Perth with primary focus on base metals.</li> </ul>
<b>INDONESIA</b>	<ul style="list-style-type: none"> <li>Active exploration office established in Manila, and later Baguio, focusing on greenfields exploration, advanced project assessments, and relationship building with local industry players. The latter strategy led to the recent copper/gold discovery by Anglo, with Philex Gold, at Boyongan in Mindanao.</li> </ul>
<b>PAPUA NEW GUINEA</b>	<ul style="list-style-type: none"> <li>Active exploration office established in Jakarta with primary focus on advanced project evaluation and monitoring of already-established joint ventures in Indonesia. Substantial nickel laterite due diligence work was undertaken.</li> </ul>
<b>FIJI</b>	<ul style="list-style-type: none"> <li>Active exploration office established in Mount Hagen with focus on greenfields exploration and advanced project evaluation. Substantial groundwork, as well as nickel laterite and copper/gold due diligence work was undertaken.</li> </ul>
<b>MYANMAR</b>	<ul style="list-style-type: none"> <li>Exploration company established and active exploration undertaken by fully financed JV partner looking for copper/gold porphyry-style mineralisation.</li> </ul>
<b>CHINA</b>	<ul style="list-style-type: none"> <li>In-depth country review undertaken over two years, including reconnaissance groundwork and extensive government negotiation.</li> </ul>
<b>VIETNAM &amp; LAOS</b>	<ul style="list-style-type: none"> <li>Annual in-country review of investment potential undertaken, primarily based on discussions with government and large investors already active in China.</li> </ul>
<b>Experience with Anglo American</b>	<p style="text-align: center;"><b><u>Johannesburg (1986 to 1996) and Before</u></b></p> <p style="text-align: center;"><b>In 1996 appointed Consulting Geologist<sup>1</sup> managing Exploration in Eastern Africa</b></p> <p>Under various titles, ultimately responsible for: (a) All Anglo New Mining Business Division's exploration for gold and base metals from Mozambique to Egypt; (b) Its Geochemistry Department which also undertook all the Division's resource evaluation work using DATAMINE; (c) Its Geographic Information Systems; (d) All liaison with Normandy Exploration, Anglo's joint venture partner in SE Asia and Australia.</p>
<b>Significant Project and Mine Work</b>	<ul style="list-style-type: none"> <li><b>Phoenix Nickel Mine Feasibility Study (Botswana)</b> Team member throughout study (published 1994) and mine commissioning, responsible for the application of novel evaluation techniques for highly discontinuous mineralisation, and for the development of grade control and reconciliation systems.</li> </ul>

<sup>1</sup> This was the term traditionally used by South African mining houses for Vice President (Exploration)



	<ul style="list-style-type: none"><li>• <b>Sadiola Gold Mine Feasibility Study (Mali)</b> Feasibility study (published 1993) and early mine construction responsibility for resource evaluation, validation by the International Finance Corporation, and development of grade control and reconciliation systems.</li><li>• <b>Namakwa Sands Mine Feasibility Study (South Africa)</b> Throughout study (published 1991) and mine commissioning, responsible for resource evaluation, and subsequent development and implementation of grade control and reconciliation systems.</li><li>• <b>Uitkomst Nickel Mine Feasibility Study (South Africa)</b> Responsible for resource evaluation (published 1991) which included innovative dyke-removal and dilution estimation techniques in DATAMINE.</li><li>• <b>Navachab Gold Mine Feasibility Study (Namibia)</b> Member of team throughout study (published 1987) and mine commissioning, responsible for resource evaluation, and development and implementation of grade control and reconciliation systems. Lived in Namibia 1985 to 1986.</li><li>• <b>Middelplaats Manganese Mine (South Africa)</b> Laboratory Manager - Set up and commissioned assay laboratory, XRF research, grade control, heavy media beneficiation testing. Responsible for the processing section of Feasibility Study on beneficiation by Heavy Media Separation of Middleplaats Mine manganese ore (published 1981).</li></ul>
<b>Significant Exploration Work</b>	<ul style="list-style-type: none"><li>• Starting in 1992, established and managed exploration activities for gold and base metals in <b>Tanzania</b>. With artisanal assistance, discovered the <b>Buzwagi/Chocolate Reef</b> mineralisation (over one million ounce Au resource) and effected the <b>successful tender for the Nyamulilima Hill licence at Geita</b>, now a gold resource of two million ounces.</li><li>• Worked for the Base Metals Division Cape Town office from 1982 on <b>Zinc exploration</b> in the NW Cape and on the <b>Riviera skarn tungsten</b> deposit in the SW Cape.</li><li>• Sent to Imperial College (London) in 1982 to study exploration techniques in <b>Soil Vapour Phase geochemistry</b>. Tested these exhaustively in different African terrains.</li></ul>
<b>Other</b>	<ul style="list-style-type: none"><li>• <b>Laboratory Analyst</b> – Anglo American Research Laboratories, Johannesburg; (Routine geochemical analyses: X-Ray, Atomic Absorption, Wet Chemistry) (1978)</li><li>• <b>Finsch Diamond Mine (South Africa)</b> Two month open pit mapping project (1975)</li><li>• <b>Letseng Diamond Mine (Lesotho)</b> Two month underground mapping project (1976)</li></ul>



Selected Publications	
	<ul style="list-style-type: none"><li>• <b>“Terminology, Translation and Artificial Intelligence”</b>; Smyth C. and Krzman Y; Paper presented at the International Federation of Translators (FIT) Congress in Varadero, Cuba, in June, 2022</li><li>• <b>“INSPIRE standards as a framework for artificial intelligence applications: a landslide example”</b>; Roberti et al (2020) in Natural Hazards and Earth System Sciences 20 (12): 3455–83. <a href="https://doi.org/10.5194/nhess-20-3455-2020">https://doi.org/10.5194/nhess-20-3455-2020</a>.</li><li>• <b>“A Framework for Ontologically-Grounded Probabilistic Matching”</b>, Rita Sharma, David Poole and Clinton Smyth; International Journal of Approximate Reasoning, 51(2), 240-262, January 2010</li><li>• <b>‘Ontology Design for Scientific Theories That Make Probabilistic Predictions’</b> Poole, Smyth &amp; Sharma; IEEE Intelligent Systems, vol. 24, no. 1, pp. 27-36, Jan./Feb. 2009</li><li>• <b>‘Semantic Science: Ontologies, Data and Probabilistic Theories’</b> Poole, Smyth &amp; Sharma in “Uncertainty Reasoning for the Semantic Web I”; Springer, October, 2008.</li><li>• <b>‘Semantic e-Science and Geology’</b> Clinton Smyth, David Poole and Rita Sharma, 2007 Association for the Advancement of Artificial Intelligence Workshop on e-Science</li><li>• <b>‘Representing and Reasoning with Intervals’</b>, Erica Huang, Clinton Smyth and David Poole. 2005 Annual Conference of the International Association for Mathematical Geology</li><li>• <b>‘Type Uncertainty in Ontologically-Grounded Qualitative Probabilistic Matching’</b> Poole D. and Smyth C. Eighth European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty (ECSQARU-2005), Barcelona, July 2005.</li><li>• <b>‘Qualitative Probabilistic Matching with Hierarchical Descriptions’</b>, Smyth C. and Poole D. Ninth International Conference on Principles of Knowledge Representation and Reasoning (KR-2004), Whistler, June, 2004.</li><li>• <b>‘Expert System-Assisted Interpretation of Multi-Element Geochemical Borehole Profiles’</b> 1985 MSc. Thesis (Computing) Imperial College, London.</li><li>• <b>‘X-Ray Fluorescence determination of manganese levels in powder brickettes of manganese ore’</b> 1983 MSc. Thesis (Geochemistry) University of Cape Town</li></ul>