

SP Duggan

Personal Information

Marital status: Married
Nationality: South African
Date of birth: 20th April 1955
Place of Birth: Johannesburg, South Africa

Tertiary Education

MSc Mining Engineering (Geostatistics)
University of the Witwatersrand (Johannesburg, South Africa)

BSc (Hons) Geochemistry
University of Stellenbosch (Stellenbosch, South Africa)

BSc Geology/Geochemistry
University of Stellenbosch (Stellenbosch, South Africa)

Professional Experience

2008 - Present Z Star Mineral Resource Consultants, (Pty) Ltd. Cape Town.

Director & Principal Mineral Resource Analyst

Responsible for estimation and classification of mineral resources, due diligence and sample optimisation studies. Consults on governance related to the management of mineral resources and provides independent assurance and auditing of mineral resources and reserves. Responsible for the development technical systems aimed at facilitating the management of mineral resources and reserves, (e.g. mineral resource classification systems, specialised mine planning systems). Consults on all aspects of primary and secondary diamond deposits, including geological modelling, sampling optimisation, geostatistical estimation, size frequency distributions and revenue estimation. Ensures compliance with international reporting codes (e.g. SAMREC, JORC and NI 43-101) and is a Competent Person. Consults on all aspects related to the evaluation of Volcanogenic Massive Sulphide Deposits including drilling optimisation, geological domaining, geostatistical estimation and classification.

2004 - 2008 De Beers Group Services (Pty) Ltd. Cape Town.

Principal Mineral Resource Analyst

Utilised geostatistical simulation methods to optimise sampling programmes on land and in the sea. Conducted local mineral resource estimation of a Midwater deposit (valued at >US\$500m). Global resource estimation of Namibia's Midwater diamond deposits (>US\$4b). Active member of De Beers Mineral Resource Classification Committee (MRCC) classifying all De Beers deposits worldwide. Active in international sampling conferences and Chairman of the World Conference on Sampling and Blending (WCSB4). Responsible for producing MRM guidelines for all De Beers operations worldwide as part of an initiative to improve corporate governance. Responsible for "project Aladdin" aimed at creating data rooms and associated electronic visualisation systems on all De Beers operations in South Africa.

2000 - 2004 De Beers Group Services (Pty) Ltd. Cape Town.

Divisional Mineral Resource Analyst

Used geostatistical techniques to provide local block estimates of marine diamond deposits. Developed geostatistical simulation methods to quantify mineral resource classification of a deflation deposit. Used geostatistical simulation methods to optimise sampling programmes (on land and in the sea). Provided assurance on mineral resource estimates for large capital projects. Key member of the team that developed a semi-quantitative mineral resource classification system.

1998 - 2000 Namdeb (Pty) Ltd. Oranjemund.

Evaluation Manager

Initiated a ~US\$6m project to develop a mineral resource in the Inshore areas. Supervised marine geophysics and sampling programmes. Responsible person for public disclosure of company mineral resource and reserve figures. Introduced correct MRM (mineral resource management) practice and set up a robust reconciliation and auditing practice.

1995 - 1998 Anglo American Corporation of SA. Johannesburg.

Divisional Mineral Resource Analyst

Member of MINRED team providing a technical service to all Anglo American mines worldwide. Successfully completed research to establish the optimum sample configuration for estimation of deep-water deposits to an Indicated level of confidence. Provided assurance to directors for mineral resource estimates of large capital projects.

1985 - 1994 De Beers Marine (Pty) Ltd. Cape Town.

Geologist, Staff Geologist, Senior Mine Geologist, Section Evaluation Geologist

Responsible for data acquisition on board deep-water geophysics vessel. Interpretation of side scan sonar and seismic data and development of a geology model. Responsible for deep-water marine sampling operations (including vessel positioning and time utilisation) on three vessels. Conducted visual surveys of the seabed and developed a method of classifying the seabed to facilitate the design of mining tools. Successfully developed geostatistical methods for estimating a mineral resource for the deep-water deposits. Supervised the development of a relational database for storing and reporting on mineral resource figures. Supervised operations on board the first mining vessel for the initial test phase and then for the first year of production. Produced the first long term scenario mine plan. Part of the team that developed the seabed crawler for mining. Carried out geostatistical simulation exercises to establish the optimum sample size required to estimate resources at an Indicated level of confidence. Planned and supervised a test sampling programme prior to commencing routine sampling.

1975 - 1985 Anglo American Corporation of SA.

Student / Field Officer

Intermittent university study and geological field work in the Gold and Base metal divisions of Anglo American. Conducted a range of geophysical exploration surveys (ground magnetic, EM, resistivity, radar, gravimetric surveys) and carried out numerous reconnaissance stream sediment and soil geochemical sampling programmes. Cut and logged core from deep drilling targeting the Wits gold.

Professional Affiliations

South African Council for Natural Scientific Professions (SACNSP):
Professional Natural Scientist (Reg No. 400035/01)

Member of the following:

- Geological Society of South Africa (GSSA);
- Geostatistical Association of South Africa (GASA);
- Geological Society of Namibia; and
- Society of Economic Geologists (SEG).

Publications

Duggan, S.P. 1995. Geostatistical Evaluation of a Marine Deposit. Project Report submitted for an MSc degree in Mining Engineering. University of the Witwatersrand.

Duggan, S.P., Dimitrakopoulos. 2005. R. Application of Conditional Simulation to Quantify Uncertainty and to Classify a Diamond Deflation Deposit. O. Leuangthong and CV Deutsch (eds.), Geostatistics Banff, Springer 2005 Vol. I, 419-428.

Duggan, S.P. November 2005. Application of Conditional Simulation to Optimise Sampling Diamond Placer Deposits. SAIMM Conference on Exploration, Mine, Met and Environmental Sampling. Proceedings.

Duggan, S.P., Lantuejoul, and C., Prins. C. October 2007. Towards an Optimum Sample Support for Estimating the Diamond Density of Placer Deposits. WCSB3, Proceedings.

Burger, J.U., Duggan, S.P. October 2009. Comparing Different Methods of Sampling to Estimate the Mineral Resource in the Elizabeth Bay Aeolian Diamond Placer. WCSB4, Proceedings.

Duggan, S.P., Grills, J.A., Stiefenhofer, J., Thurston, M. May 2016. Development of a best-practice mineral resource classification system for the De Beers group of companies. The SAIMM conference on the SAMREC/SAMVAL Companion volume. Proceedings.