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A review and assessment of the appropriateness of the mineral resource estimation and classification practices, as currently applied to the MG1 Chrome seam on a Bushveld Complex Chrome Mine

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ABSTRACT

The applicability of both the Mineral Resource estimation and classification practices of the MG1 chrome seam on a Bushveld Complex mine are addressed in this research. The Growth technique (a 2D gridding algorithm) available in Geovia Minex™ software, currently used for resource estimation. Mineral Resource classification is based on the application of fixed radii (150m, 300m and 600m for Measured, Indicated and Inferred Resources respectively) to verified MG1 chromitite borehole intersections. The Competent Person can at his/her discretion, manually adjust classified Mineral Resource boundaries resulting from the radii for resource declaration. These practises stem from experience gained over many years of mining the MG1 chromitite resource. Establishing formal methodologies supported by research and comparative studies for MG1 chrome resource estimation and classification are the focus areas for this research investigation. The benefit of having technical support for the resource estimation and classification practices is that this will assist the Competent Person (CP) in his/her justification for estimation and classification methodologies in the resource declaration of the mine, a requirement of the Mineral Resource reporting codes. Having formal backing for these practices is considered value adding to the mine.

Growth technique estimation is compared to alternative estimation methodologies namely Inverse Distance Weighting (IDW) and Ordinary Kriging (OK). The fixed radii resource classification procedure is weighed up against published Mineral Resources classification approaches found in the resources industry. Within the current sampling configuration IDW and Ordinary Kriging estimation results were globally similar to those of the Growth technique. Locally however, IDW to the power two and OK produced more representative estimates.

Mineral Resource classification methods based on geostatistical parameters and measures confirmed that the fixed borehole confidence radii used for resource classification are applicable. Spatially the geostatistical classification approach resulted in a more sensible representation of the Mineral Resource categories. In conclusion the influence and impact of geological factors on resource classification are stressed. The development and implementation of a Mineral Resource classification scorecard approach is recommended, as such would result in a transparent, defendable, and robust classification methodology meeting mineral Resource Reporting Code requirements.