

Characterization of coal seams within the Coalbrook Sub-basin, Vereeniging-Sasolburg Coalfield, South Africa: Insights into the palaeo-depositional environment

*“The sooner we comprehend that coal is not the gorilla we make it out to be, the better we will appreciate its strength”- Fatima Zonke Chitlango.*

**IsiZulu: Ucwangingo lwamalahle ngaphakathi kwe-Coalbrook Sub-basin, Vereeniging-Sasolburg Coalfield, eNingizimu Afrika: Imibono ngemvelo yendawo yasemandulo**

Amalahle eNingizimu Afrika asetshenziswa kakhulu ekuphehleni nokukhiqiza kukagesi. Eminye imikhakha lapho okusetshenziswa khona amalahle kufaka phakathi njengomthombo wamandla embonini kasimende, imboni yensimbi engeyesibili ngobukhulu esebenzisa amalahle, kanye nokusetshenziswa abe umanyolo wezitshalo. INingizimu Afrika iseyizwe elisathuthuka futhi elisazo sebenzisa amalahle esikhathini esizayo, yingakho kubalulekile ukuqonda amalahle azungeze izwe luthu.

Ukuqonda izici ezibonakalayo namakhemikhali zamalahle kubalulekile ekuchazeni izindawo zawo zase mandulo, futhi kwazisa ukusetshenziswa kwawo, izindlela zokumba, kanye nokuhlelwa kwemayini. Lolu cwangingo luhlose ukwenza imininingwane eningiliziwe yamasampula amalahle asuka endaweni yase-Coalbrook, e-Vereeniging-Sasolburg Coalfield, eNingizimu Afrika, ukuze kutholakale ulwazi nge-petrology, mineralogy, kanye ne-geochemistry yamalahle akhona kule ngxenye engafundiwe kahle. Lokhu kuzosisiza ukubeni nolwazi olujulile ngezimo zezulu zasemandulo kanye nokuthi indawo lapho kwakhekha khona amalahle endulo yayinjani. Amasampula amalahle angamashumi amane (40) avela kumaboreholes amane, okuyi-SLD01a, 02a, 04a, kanye ne-06a, asetshenziswe ukuhlaziya amalahle kulophenyo; okufaka i-petrography, i-X-ray diffraction (XRD), kanye ne-X-ray fluorescence (XRF). Kutholakale ukuthi amasampuli asetshenzisiwe kulocwangingo abizwa nge-bituminous yezinga eliphansi elingi A sub-bituminous kuya kwasezingeni elimaphakathi elingu-D. Amalahle atholakale ukuthi akheke nge-zingxenye zezitshalo (macerals), eqembu le-inertite asuka ku-42.0 kuya ku-90.6 vol% (semifusinite, fusinite, ne-inertodetrinite) kanye nezingxenye zeqembu le-vitrinite. Ukwanda kwezingxenye zezitshalo ezitholakala kulawa malahle kuphakamiswa umoya wempilo, pheqelesi obizwa nge-oxygen odala i-oxidation ezingazungezile odakeni. Ukutholaka kwe-inertinite ne-vitrinite nakho kubonisa ukuhlukahluka kwezimo zamalahle zasemandulo, kusukela ku-oxic kuya kwe-anoxic. Amaminerali avelele

kumalahle aqwaningiwe afaka i-kaolinite (ikakhulukazi e-detrital) ne-quartz (e-detrital), ebonisa ukuthi amalahle abumbane ngesikhathi esisodwa nalawa ma-minerali. I-kaolinite e-authigenic yande kahlulu kuma-lumens kanye nasezimbobeni zezingxenye zezitshalo ezindaweni ezinganawo amanzi amaningi ezine- pH ephansi ebanga ukuthi indawo yamalahle ibe no-asidi. Iziza zokubeka amalahle asuka endaweni yase-Coalbrook Sub-basin zihluka kancane kwezinye izinkundla zamalahle ku-Main Karoo Basin njengoba amalahle asezindaweni ezifana ne-Witbank, Highveld, kanye ne-Ermelo Coalfields atholakala ezindaweni ezinamathafa avulela olwandle eneziziba kanye nasezindaweni ezimanzi ezihlangeni nemifula. Amalahle ase-Coalbrook Sub-basin atholakala ezindaweni eziphakeme ezifana nezintaba lapho ekungatholakala khona ichibi , ezingase zibe khona ngenxa yokuthi ngokwemvelo zinqwabelanisa amanzi, zicupha inhlabathi, futhi zivame ukuzwa ukugeleza kwamanzi okulinganiselwe (ngaphandle kwezikhathi zemvula enkulu, okuholela ezikhukhuleni). Amanzi angaphansi kwamachibi, ikakhulukazi ezindaweni ezijulile, angaba nomoya wemvelo omfushane, okusiza ekulondolozeni izandulela ezinokhuni oludingekayo kuhle amalahle abumdane akekhe. Aphinde amalahle atholakala ezindaweni eziphansi ezintabeni. Lezi zindawo izona ezandulela endulo lapho amalahle wethu atholakala khona. Lokhu kuguquguquka kuthinta ukwakheka kwenhlabathi odakeni lwe-paleo-mire kanye ne-organic matter njengoba kuboniswa ukuhlaziywa kwe-petrographic.

Ukuthola imininingwane ngendawo yokubeka kanye nezakhiwo zamalahle kungadalula ezinye izinhlelo zokusebenza futhi kusize izinqumo zamasu ezihambisana nezitayela zamandla omhlaba kanye namathuba omnotho. INingizimu Afrika iseyizwe elisathuthuka futhi sisazosebenzisa amalahle esikhathini esizayo yingakho kubalulekile ukuthi sihumushele imiphakathi yethu ucwaningo lwethu kanye nesikutholile ukuze abantu bakithi bazi ukubaluleka kwamalahle ezweni lethu. Amalahle akawona isilwane esithusayo, abalulekile kwezomnotho kulesi-sizwe sethu esinsudu futhi sidinga ukuqhamuka nezindlela zokumbiwa kwezimayini nokusebenzisa amalahle ngendlela evikela imvelo yethu. Zikundise, uzakhe sizwe esimnyama, ikusasa lakho lisezandleni zakho.