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**Possible environmental causes and implications of corrosion on housing structures (Bontleng): A case study**

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An environmental geochemical investigation was carried out in Bontleng to determine the possible environmental causes and implications of corrosion on housing where metal, brickwork, plastering, paintworks, cement flooring and metallic door frames were affected. Soil samples were collected for sieve analysis, Atterberg limits, and mineralogical assessment.

Water samples encountered at 0.9m seepage were analysed for major ions and trace elements as elemental oxides. Measured lab and field  $pH$  were 7.12 and 6.67 respectively. Samples from plaster reacted with 0.1 HCl hence confirming of carbonates. Results from soil analysis showed high content of silica (quartz), feldspars (microcline and albite) whereas results from major ion water analysis reflected relatively high Mg, Na, K, and  $CO_2$ ,  $HCO_3^-$ . The carbonate precipitate is a result of silica weathering<sup>1</sup>. Groundwater is enriched in metallic cation and silica during weathering and dissolution of silicate minerals. Reaction of  $CO_2$  in water produced carbonic acid ( $H_2CO_3$ ) hence corrosion. However this is the same process that tends to increase the concentration of bicarbonate ( $HCO_3^-$ ). The weathering, of structures was exacerbated by pressure of high elemental content in the seepage water at shallow depths.

**Reference**

[1] Appelo, C.A.J., Postma, D. (1996). Geochemistry, groundwater and pollution. Balkema: Rotterdam, CRC press, 375-395

