

Table 3.1 Lithological descriptions provided for the manganeseiferous succession at Nsuta by previous authors.

Lithology	Service (1943)	Kleinschrot et al. (1994)	Nyame (1998)	Present study
Greenstone	Can be lavas or pyroclastic rocks. Fine grained, pale to dark green rocks usually containing large porphyroblasts of ferrous carbonate and cubes of pyrite. Some varieties are characterised by large pitted porphyroblasts of greenish-brown biotite in a matrix of quartz, albite, chlorite (or sericite), and epidote (or zoisite).	Massive rocks of light grey to greenish colour and heteroblastic texture. Porphyroblasts of albite, carbonate, muscovite and actinolite. Fine matrix of chlorite, quartz, carbonate, muscovite, biotite, epidote. Accessories are tourmaline, rutile and pyrite.	Compact, light to dark green rock often containing quartz veins. Massive texture with presence of carbonate porphyroblasts. Pyrite occurs regularly. Microscopically, mineralogy is as follows: chlorite occurs in fibrous aggregates with quartz, calcite, dolomite, albite, tourmaline, apatite, pyrite and rutile.	Two varieties: (1) strongly foliated with no preservation of primary textures (upper greenstones) and (2) non-foliated with preserved volcanoclastic texture (lower greenstones). Both varieties contain chlorite, carbonate, albite, lepidote, biotite, muscovite and quartz. Undeformed samples have large carbonate porphyroblasts hosted in a fine-grained matrix. Some samples contain actinolite.
Phyllite	Typically fine grained grey rocks without cleavage but have abundant sericite. Usually well bedded with alternating cream and grey layers. Some samples are stained with Mn-oxide. Some varieties contain spessartine garnet.	Fine grained with well-developed schistosity. Minerals: quartz, muscovite, chlorite, calcite, ankerite with accessory pyrite and rutile. Chlorite can occur as porphyroblasts. Some varieties contain paragonite, muscovite, chlorite, quartz, Mn-ankerite, graphite, pyrite, ilmenite and accessory rutile. Garnet porphyroblasts often replaced by sulphides or carbonate.	Grey to dark grey, generally fine-grained rocks. Samples vary from being massive to well laminated. Some varieties appear slaty. Pyrite occurs as veins or isolated crystals, spessartine usually occurs as porphyroblasts. Carbonates occur as microconcretions or as discrete crystals. Minerals: spessartine garnet, pyrite, quartz, muscovite, chlorite, dolomite, rutile, kutnahorite, rhodochrosite and tourmaline	Typically medium grey colour, very fine-grained and always displays a well-developed foliation. Sericite growth is abundant along foliation surfaces. Microscopic quartz stringers are preferably arranged parallel to the foliation. Minerals include quartz, albite, muscovite (sericite), chlorite. Seldomly contains pyrite.
Manganese carbonate ore	Not described	Consists of >50 vol. % carbonate. Often schistose, some contain euhedral porphyroblasts of pyrite. Minor minerals: ilmenite, sphalerite, quartz, muscovite, albite, with minor phases of paragonite and chlorite. Accessories are rutile and rare tourmaline.	Very fine-grained, light grey to grey and generally massive. Twin lamellae in carbonate grains with bent cleavages. Crypto-crystalline quartz, muscovite, sulphides and rutile may occur. Minerals: rhodochrosite, kutnahorite, alleghanyite, mangano-cummingtonite, alabandite, molybdenite, pentlandite, millerite, linneite, sphalerite, chalcocopyrite, chlorite and rutile.	Light grey, very fine-grained, massive, brittle rock. Seldomly displays very fine laminations. Three dominant textural varieties: granular, granoblastic and microconcretionary (Nyame, 1998). Often crosscut by quartz and/or pink, coarse-grained rhodochrosite veins. Main mineral is rhodochrosite with or without kutnahorite.
Greywacke	Massive, hard, grey-green sediments, often finely laminated. Idioblastic crystals of grey tourmaline are common. Contain angular quartz fragments and twinned plagioclase in a matrix of quartz, zoisite, and sericite, with little chlorite.	Not described	Not described	These can be defined as the host rocks surrounding the orebody. Best described as greywacke interbedded with argillite. Greywacke is typically poorly sorted and immature but displays obvious sedimentary textures. Composed of quartz, albite, carbonate, chlorite and diagenetic pyrite. Argillite is very fine-grained, massive/finely laminated and consists mostly of carbonate and quartz.

