

DESCRIPTIVE MODEL OF REPLACEMENT Mn

By Dan L. Mosier

DESCRIPTION Manganese oxide minerals occur in epigenetic veins or cavity fillings in limestone, dolomite, or marble, which may be associated with intrusive complexes.

GEOLOGICAL ENVIRONMENT

Rock Types Limestone, dolomite, marble, and associated sedimentary rocks; granite and granodiorite plutons.

Age Range Mainly Paleozoic to Tertiary, but may be any age.

Depositional Environment Miogeosynclinal sequences intruded by small plutons.

Tectonic Setting(s) Orogenic belts, late orogenic magmatism.

Associated Deposit Types Polymetallic vein, polymetallic replacement, skarn Cu, skarn Zn, porphyry copper.

DEPOSIT DESCRIPTION

Mineralogy Rhodochrosite ± rhodonite + calcite + quartz ± barite ± fluorite ± jasper ± manganocalcite ± pyrite ± chalcopyrite ± galena ± sphalerite.

Texture/Structure Tabular veins, irregular open space fillings, lenticular pods, pipes, chimneys.

Ore Controls Fracture permeability in carbonate rocks. May be near intrusive contact.

Weathering Mn oxide minerals: psilomelane, pyrolusite, and wad form in the weathered zone and make up the richest parts of most deposits. Limonite and kaolinite.

Geochemical Signature Mn, Fe, P, Cu, Ag, Au, Pb, Zn.

EXAMPLES

Lake Valley, USNM	(Farnham, 1961)
Philipsburg, USMT	(Prinz, 1963)
Lammereck, ASTR	(Lechner and Ploching, 1956)

GRADE AND TONNAGE MODEL OF REPLACEMENT Mn

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COMMENTS Copper grades are only available for some of the low tonnage deposits. See figs. 75-76.

DEPOSITS

<u>Name</u>	<u>Country</u>	<u>Name</u>	<u>Country</u>
Atlas	USAZ	Golden Gate	USAZ
Bear Mountain	USNM	Hendricks-Twilight	USAZ
Birchfield	USNM	Kahal de Brezina	ALGR
Blinman	AUSA	Kingston	USNM
Brachy	FRNC	Lake Valley	USNM
Chloride Flat	USNM	Lammereck	ASTR
Crown King	USAZ	Las Ambollas	FRNC
Cynthia	GREC	Las Cabesses	FRNC
Danville-Hanchette	USAZ	Lone Mountain	USNM
Detroit	USUT	Los Volcanes	MXCO
Dinamita	MXCO	Mammoth	USAZ
Djebel El Aziza	TUNS	Mercedes	CUBA
Essex and Steptoe	USNV	Philipsburg	USMT

Poludnig-Hermagor
 Oregon
 Saligny
 San Carlos
 Sattelberges
 Summit-No. 4

ASTR
 USAZ
 FRNC
 MXCO
 ASTR
 USAZ

Thuburnic
 Ulukoy
 Veitsch
 Vorderen Strubberges
 Waterloo

TUNS
 TRKY
 ASTR
 ASTR
 USAZ

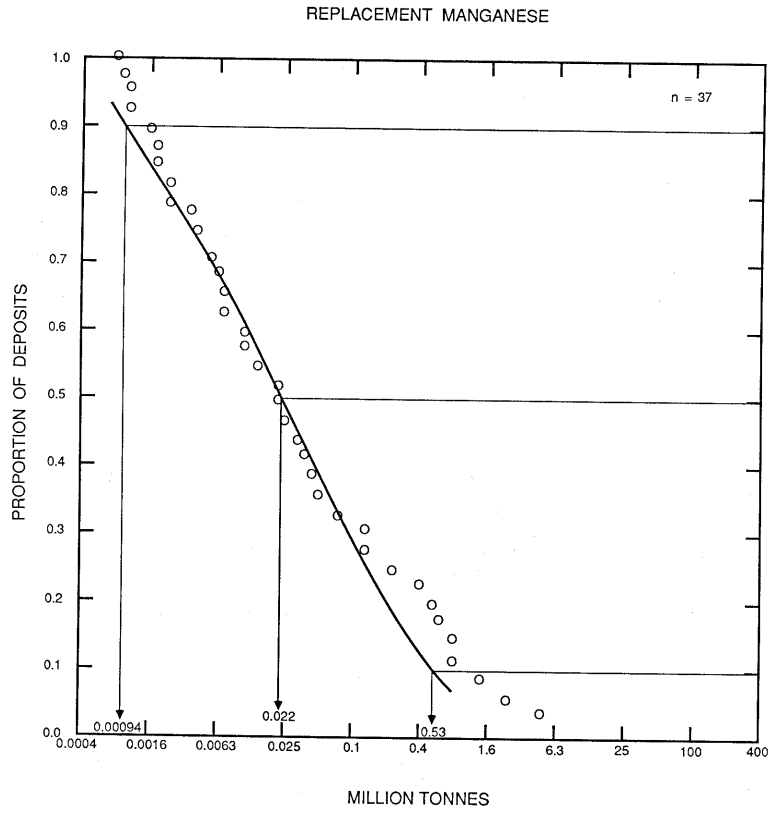


Figure 75. Tonnages of replacement Mn deposits.

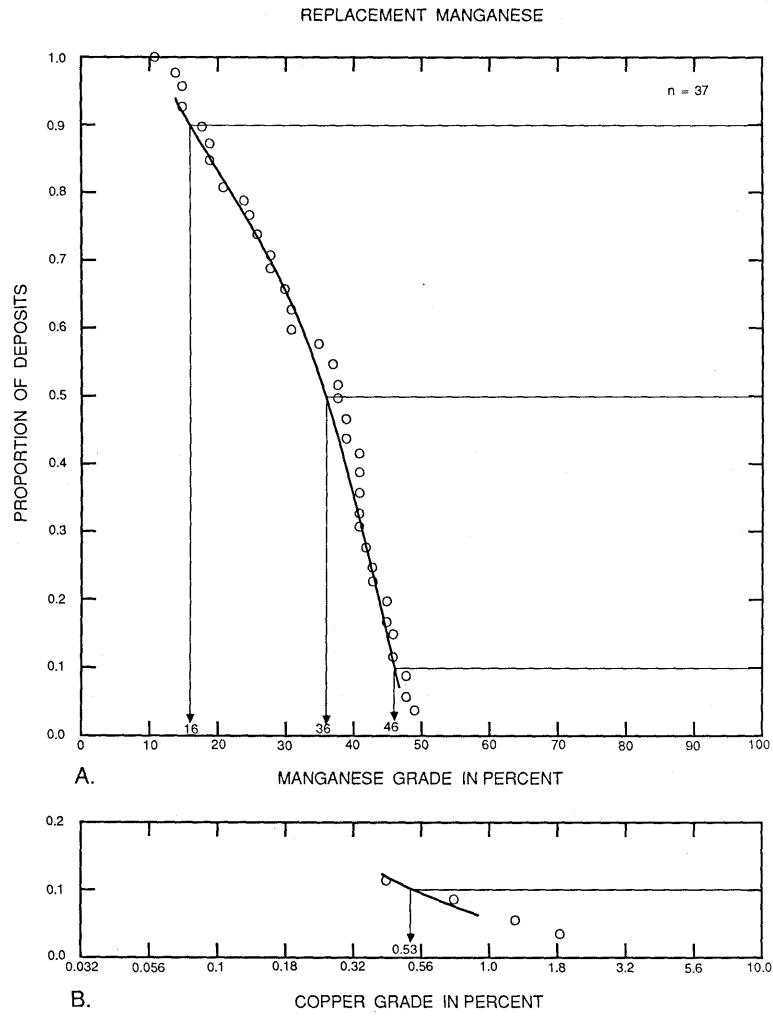


Figure 76. Manganese and copper grades of replacement Mn deposits.