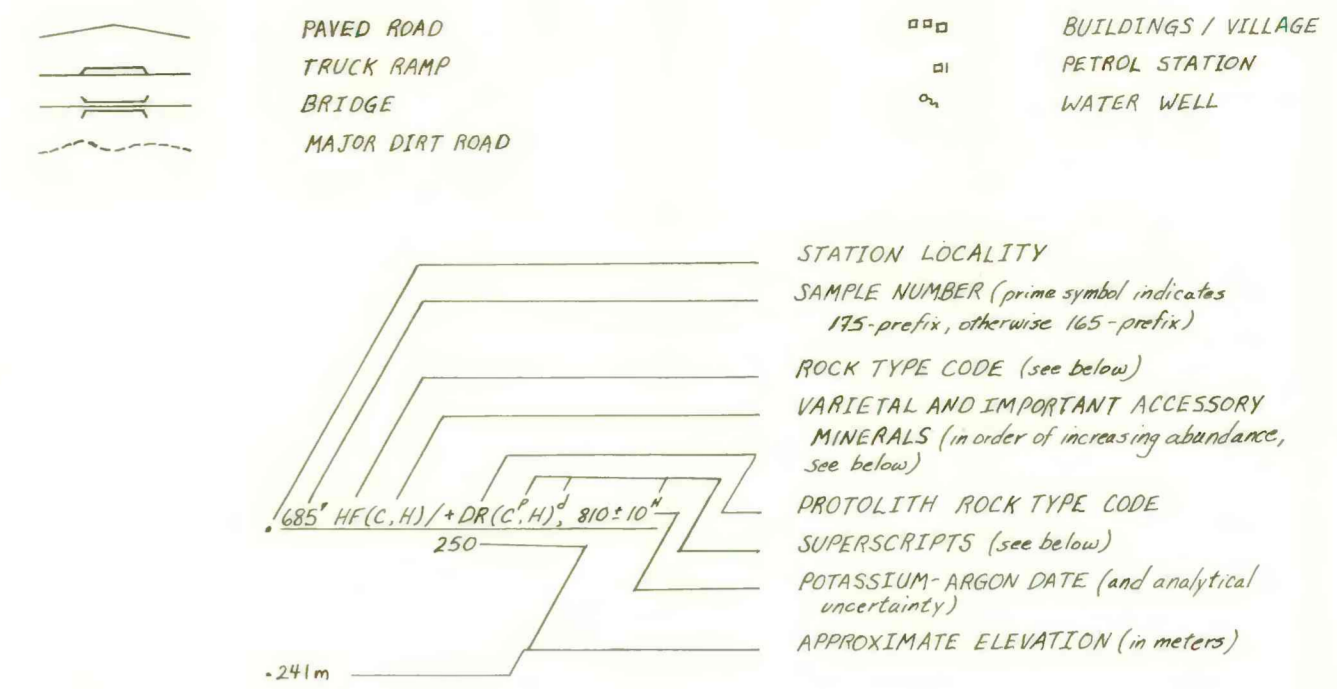


EXPLANATION



ROCK TYPE CODES

CODE	ROCK	CODE	ROCK
+	meta (prefix)	LS	limestone
+	altere (prefix)	MB	marble
AL	alaskite	MZ	metazirconite
AM	amphibolite	MY	mylonite
AN	andesite	PE	peridotite
AP	aplite	PL	plagioclase
AS	ash deposit	QD	quartz diorite
AT	amphibolite	QM	quartz monzonite
BA	basalt	QR	quartzite
BR	breccia	QZ	quartzite or quartziferous gneiss
CO	conglomerate	SH	shale
CS	claystone	SK	skarn
DB	diorite	SS	sandstone
DC	dacite	TA	trachyandesite
DR	diorite	TI	trachyte
GB	gabbro	TR	trachyte
GD	granodiorite	TT	trondhjemite
GM	granite	TD	trondhjemite
GN	gneiss	TY	typhlocryst
GP	granophyre	TZ	trachyte
GZ	granite	CM	comandite
HF	hornfels	SH	shale
GN	gneiss	MG	metagranite
DO	diorite		
GW	gneiss		
VO	volcaniclastic		

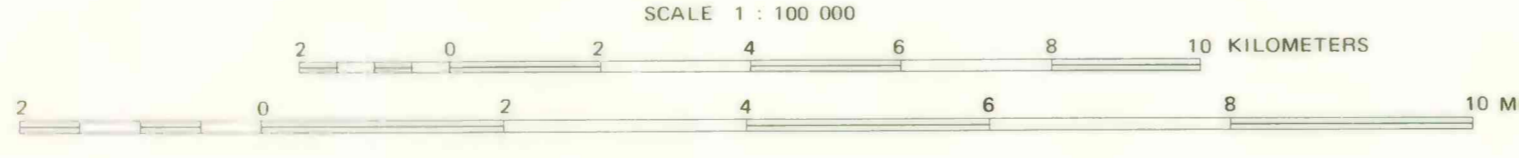
MINERAL CODES

CODE	MINERAL	CODE	MINERAL
Ca	calcite	Ka	kaolinite
Am	amphibole	Fe	ferrous silicate
Am	amphibole	M	muscovite
B	barite	M	microcline
C	calcite	Ma	magnetite
Ca	calcite	Ol	olivine
Ca	calcite	Pl	plagioclase
E	epidote	Py	pyrite
F	feldspar	Q	quartz
Fl	fluorite	Q	quartz
G	garnet	S	sericite
H	hornblende	S	sericite
He	hematite	T	tourmaline
Hy	kyanite	F	ferrous silicate
[Cu]	cuprite (stain)	O	orthopyroxene

SUPERSCRIPTS

CODE	MEANING	CODE	MEANING
A	alaskite	T	trondhjemite
d	diorite	W	whole rock K-Ar date
M	metagranite	H	hornblende K-Ar date
P	plagioclase	Pl	plagioclase K-Ar date
S	syenite	Px	pyroxene K-Ar date

Aerial photography 1955, controlled mosaic 1956
 Aero Service Corporation, Philadelphia, Penn., U.S.A.
 This report has not been edited or reviewed for conformity
 with U.S. Geological Survey standards and nomenclature.



Geology mapped in February
 and March 1961

MAP OF THE HARRAT TUFFIL QUADRANGLE, SHEET 20/39 B, KINGDOM OF SAUDI ARABIA
 SHOWING STATION LOCATIONS, ROCK TYPES, AND GEOGRAPHIC AND CULTURAL FEATURES
 by
 John S. Pallister
 1983

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 been reviewed for conformity with U.S.
 Geological Survey editorial standards
 and stratigraphic nomenclature.