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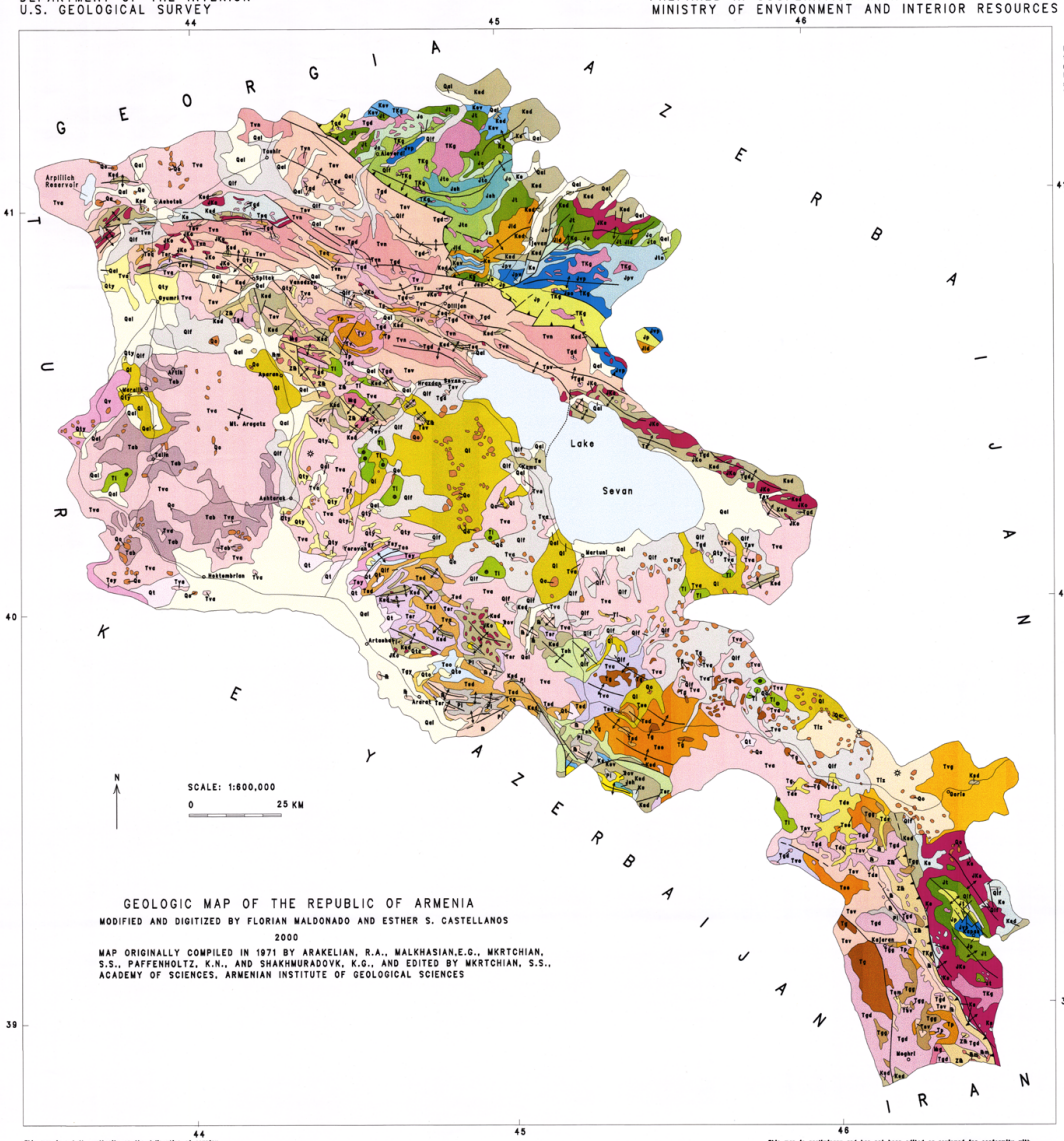

GEOLOGIC MAP OF THE REPUBLIC OF ARMENIA

MODIFIED AND DIGITIZED BY FLORIAN MALDONADO AND ESTHER S. CASTELLANOS

2000

MAP ORIGINALLY COMPILED IN 1971 BY ARAKELIAN, R.A., MALKHASIAN,E.G., MKRTCHIAN, S.S., PAFFENHOLTZ, K.N., AND SHAKHMURADOVK, K.G., AND EDITED BY MKRTCHIAN, S.S., ACADEMY OF SCIENCES, ARMENIAN INSTITUTE OF GEOLOGICAL SCIENCES

This map is not the authority on the delineation of country boundaries. Latitude and longitude ties are approximately located.

This map is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature. Any use of trade, product or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

INTRODUCTION

This map is a product that resulted from a project supported by the U.S. Agency for International Development (Participating Agency Service Agreement No. CCN-0002-P-IO-3097-00) to conduct an evaluation of coal and other fossil fuels in the Republic of Armenia. The original map has been translated to English from Russian (Marian Sotian, Academy of Sciences, Armenian Institute of Geological Sciences, written commun., 1994), digitized, and slightly modified in some areas. The original format has been modified to follow the U.S. Geological Survey's format. The map projection is not known. Latitude and longitude ties are approximately located.

CORRELATION OF MAP UNITS

Qal	Quaternary	QUATERNARY
Qtc		
Qty		
Qc		
Ql		
Qlf		
Qt		
Qv		
Tlz	Pliocene	TERTIARY
Tsm		
Tds		
Tvg	Miocene?-Pliocene	
Tn		
Tl	Miocene	
Tvo		
Tob	Tertiary	
Tl		
Tgy	Oligocene-Miocene	
Tg	late Oligocene	
Tcc	early-middle Oligocene	
Tsy	late Eocene-Miocene	
Tv	late Eocene-early Oligocene	
Tgd		
Tgg	late Eocene-early Oligocene	
Tp		
Tnq		
Tvn	middle-late Eocene	
Tvc		
Tsd	Eocene	
Tss	early-middle Eocene	
Tsv	Paleocene-early Eocene	
Tsh		
Tsr	Paleocene	
TKg	Late Cretaceous-Eocene	CRETACEOUS-TERTIARY
Ksd	Late Cretaceous	CRETACEOUS
Ksv		
Ks	Early Cretaceous	
JKo	Jurassic-Cretaceous?	JURASSIC-CRETACEOUS?
Mg	Mesozoic?	MESOZOIC?
JKs	Late Jurassic-Early Cretaceous	JURASSIC
Jld		
Jt	Late Jurassic	
Jts		
Jsh		
Jc	Middle Jurassic	
Jp		
Jpv		
Jvp		
Jsc	Early-Middle Jurassic	
Tscv	Triassic	TRIASSIC
Pl	Permian	PERMIAN
Rs	Early-Middle Devonian and Pennsylvanian	DEVONIAN AND PENNSYLVANIAN
Rm	Paleozoic?	PALEOZOIC?
ZB	Proterozoic-Early Paleozoic	PROTEROZOIC-PALEOZOIC

MAP UNITS

Qal	Alluvial deposits undivided (Quaternary)--Alluvium, proluvium, diluvi, glacial moraine and lake deposits. Deposits contain clay, sand, and gravel
Qtc	Travertine and travertine conglomerate (Quaternary)
Qty	Tuff and ash-flow tuff of Yerevan-Gyumri (Quaternary)
Qc	Monogenic cinder cones and deposit (Quaternary)
Ql	Lava flows of intermediate composition (Quaternary)--Andesite and andesitic-dacitic lava flows
Qlf	Lava flows, (Quaternary)--Basalt, andesite, andesitic-basaltic, and andesitic-dacitic lava flows
Qt	Terrace deposit (Quaternary)--Comprised of clay, sand, and gravel
Qv	Volcanic rocks (lower Quaternary)--Volcaniclastic deposits, basalt, andesite-basalt, andesite, and andesite-dacite lava flows. Deposits composed of tuffaceous sandstone and tuffaceous conglomerate
Tlz	Volcanic deposits of Ishkhansar and lava flows of Zangezur plateau (Pliocene)
Tsm	Carbonaceous shaly sandstone in Meghri region (Pliocene)
Tds	Clay-diatomite deposit of Sisian (Miocene?-Pliocene)
Tvg	Volcanic and volcaniclastic rocks of Goris (Miocene?-Pliocene)
Tn	Sandstone, conglomerate, and clay (Miocene?-Pliocene)
Tvo	Volcanic rocks of Armenian Highland (Tertiary)-Andesite, trachyandesite, andesite-dacite, dolerite-basalt lava flows, tuffs, tuffaceous conglomerate, and tuffaceous sandstone
Tob	Tuffs and ash-flow tuffs of Artik and Burakan (Tertiary)
Tl	Rhyolite, dacite, pumice, obsidian, and perlite (Tertiary)
Tgy	Gypsum-halite-bearing rocks near Yerevan region (Oligocene-Miocene)
Tcc	Rocks of Chagala-Charakchpur (early-middle Oligocene)--Sandstone, and gypsiferous-bearing-clay
Tsy	Sedimentary rocks near Yerevan and Hoktemberian (late Eocene-Miocene)--Composed of variegated units of sandstone, clay, and conglomerate
Tv	Volcanic rocks (late Eocene-Oligocene)--Leucitic prophyry, trachyte, and aptophyre trachyandesite lava flows and tuff
Tvn	Volcanic rocks of north Armenia (middle-late Eocene)--Porphyry, andesite, basalt, and dacite lava flows and ash-flow tuff of rhyolite-dacite composition
Tvc	Volcaniclastic and sedimentary rocks (middle-late Eocene)--Tuffaceous sandstone, tuff, sandstone, clay, and marl
Tsd	Sedimentary rocks (Eocene)--Limestone, marl, and sandstone
Tss	Sedimentary and volcanic rocks of east Hayadzor-Zangezur (early-middle Eocene)
Tsv	Sedimentary and volcanic rocks (Paleocene-early Eocene)--Tuffaceous sandstone, sandstone, marl, porphyry, and tuff; locally contains coal beds
Tsh	Sedimentary rocks of Hayadzor (Paleocene-early Eocene)--Sandstone, slate, marl limestone, and basaltic conglomerate
Tsr	Sedimentary rocks (Paleocene)--Sandstone, siltstone, marl, limestone, and conglomerate
Ksd	Sedimentary rocks (Late Cretaceous (Turonian-Cenomanian))--Carbonate and terrigenic deposited limestone, marl, sandstone siltstone, and conglomerate
Ksv	Sedimentary and volcaniclastic rocks (Late Cretaceous (Cenomanian))--Sandstone, limestone, and tuffaceous sandstone
Ks	Sedimentary and minor volcanic rocks (Early Cretaceous (Valanginian-Aptian))--Limestone, marl, sandstone, tuffaceous conglomerate, and porphyry
JKo	Volcaniclastic and sedimentary rocks (Late Jurassic-Early Cretaceous (Oxfordian-Valanginian))--Porphyry, ash-flow tuff, tuffaceous conglomerate and sandstone, with minor limestone
Jld	Sedimentary rocks (Late Jurassic (Late Oxfordian-Early Kimmeridgian))--Limestone, dolomite, and quartzite
Jt	Sedimentary and volcaniclastic rocks (Late Jurassic (Oxfordian))--Tuffaceous conglomerate and limestone lenses
Jts	Tuffaceous sandstone, shale, breccia, and porphyry (Middle Jurassic (Callovian))
Jsh	Sedimentary deposit of South Haladzer (Middle Jurassic (Bathonian))--Limestone, marl, and conglomerate
Jc	Volcanic and volcaniclastic rocks (Middle Jurassic (Upper Bathonian))--Trachyte, ash-flow tuff, prophyry, and tuffaceous sandstone and conglomerate
Jp	Plagioclase, quartz, and quartz-plagioclase porphyry (Middle Jurassic (Middle-Upper Bajocian))
Jpv	Porphyry, volcanic and volcaniclastic rocks (Middle Jurassic (Middle-Upper Bajocian))--Quartz-plagioclase porphyry, ash-flow tuff, and tuffaceous sandstone; locally contains coal beds
Jvp	Volcanic and plagioclase-epidote porphyry rocks (Middle Jurassic (Upper Aalenian-Lower Bajocian))
Jsc	Schist and conglomerate (Early-Middle Jurassic (Toarcian-Lower Aalenian))
Tscv	Terrigenic-carbonifeous rocks of Vedi and dolomitic limestone of Haladzor (Triassic)
Pl	Limestone and bituminous schist (Permian)
Rs	Upper Paleozoic rocks (Early-Middle Devonian and Pennsylvanian (Early Carboniferous))--Limestone, sandstone, schist, and quartzite
ZB	Proterozoic to Early Paleozoic rocks (Proterozoic-Early Paleozoic)--Schist, limestone, and marble. Volcanic rocks found locally at Zangezur

PREDOMINATELY INTRUSIVE ROCKS

Tl	Intrusive and extrusive rocks of acid and middle composition (Miocene)--Dacite, andesite-dacite, trachyrhyolite
Tg	Porphyritic granite, granodiorite, and monzonite (late Oligocene)
Tgd	Granodiorite, monzonite, granite, and diorite (late Eocene-early Oligocene)
Tgg	Gabbro, gabbro-diorite, and pyroxenite (late Eocene-early Oligocene)
Tp	Pseudoleucite, nepheline, and alkalic syenite (late Eocene-early Oligocene)
Tsq	Subvolcanic quartz prophyry, albitite, and rhyolite-dacite (late Eocene)
TKg	Granite, granodiorite, diorite, gabbro, and albitite (Late Cretaceous-Eocene)
JKo	Ophiolite complex (Jurassic-Cretaceous?)--Gabbroic-pyroxenite, peridotite, dunite, and serpentinite
Mg	Leucogratic granite, migmatite, microcline granite,diorite, gabbro-diorite of Tsochkunists region and granite-gneiss of south Zangezur region (Mesozoic?)
Rm	Metamorphic complex (Paleozoic?)--Gabbro and pyroxenite

MAP SYMBOLS

- Contact
- Thrust fault, sawteeth on upper plate, queried where uncertain
- Principal line of fault, dashed where approximately located,dotted where concealed
- Principal axis of anticline, dotted where concealed
- Polygenic volcanic vents
- Monogenic rhyolite lava dome
- City
- Road