

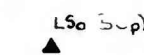
DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

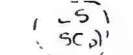
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Sheet 2 of 5 sheets

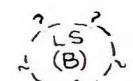
Preliminary report on the engineering geology of the Boulder quadrangle,
Boulder County, Colorado

MAP EXPLANATION

Surficial deposits (Engineering soils)		Sedimentary bedrock		Igneous and metamorphic bedrock	
fw	Sanitary landfill	cs-ms	Highly swelling claystone and siltstone	bg	Biotitic gneiss
fe	Earthwork	cs-sh	Moderately swelling claystone and shale	gt	Granite
GS	Cobbly gravel and sand	ms-sh	Slightly swelling siltstone and shale	pa	Pegmatite and aplite
Smb	Silty bouldery sand and gravel	cs-ms	Nonswelling claystone and siltstone	db	Dark heavy rock
Smo	Organic silty sand and gravel	ms-cs-ls	Siltstone, claystone and limestone	fr	Thoroughly fractured rock
SCp	Pebbly sand, silt and clay	ms	Red siltstone		
GCb	Bouldery gravel and clay	ss	Soft sandstone		
B	Sandstone blocks	ss-ms	Sandstone and siltstone		
Cm	Silty clay	ss-ms-cs	Hard sandstone, siltstone and claystone		
		ss	Hard sandstone		
		cgl-ms	Conglomerate and siltstone		
		ls	Limestone		

Known

Inferred

Possible

Landslide deposits

Map symbols enclosed in parentheses (SCp) indicate predominant soil texture or rock lithology of the landslide deposit

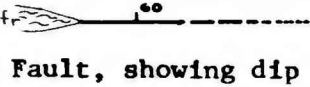
Known landslide deposits.--Areas where slopes of earth, rock, or manmade fill failed during the time of this field study (June 1967 to May 1968), or where recent failure can be demonstrated from aerial photographs, maps, and written reports and records. Includes areas where: landslide deposits have been removed by excavation, LSx; landslides have been stabilized artificially by redistribution of material, LSs; continued landslide activity probable, LSa. Locations accurately shown. Areas generally less than 200 feet in maximum horizontal dimension

Inferred landslide deposits.--Areas where slope failures in earth or rock masses were not demonstrable when mapped for this study, but where landsliding is inferred from geologic or topographic evidence, to have occurred at some time in the past. Boundaries shown by short dashed lines are approximately located

Possible landslide deposits.--Areas where slope failures in earth or rock masses were neither known nor inferred when the area was mapped for this study, but where certain geologic or topographic features suggest the possibility that landsliding may have occurred at some time in the past. Boundaries shown by short dashed line with queries are located with questionable accuracy

Contact

Dashed where approximately located; short dashed where gradational or inferred; dotted where concealed



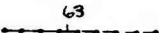
Fault, showing dip

A fracture, or fractured zone, in rock where there has been movement parallel to the surface along which fracturing occurred. In most places, faults contain breccia (crushed, angular rock) and gouge (clay and finely divided rock fragments). In granite and biotite gneiss, faults grade into shear zones of thoroughly fractured rock (fr). Symbols dashed where approximately located; short dashed where inferred; dotted where concealed



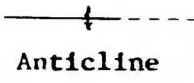
Dike

Tabular body of igneous rock. Map unit symbol not shown for granitic to dioritic rock; other rocks as indicated; pegmatite and aplite: pa; dark heavy igneous rocks: db

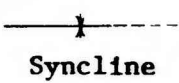


Vein, showing dip

Mineralized deposit forming tabular body in altered or fractured rock. Vein and host rock exposed in places in long, narrow prospect pits. Symbol dashed where approximately located

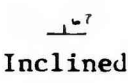


Anticline



Syncline

An anticline is an elongated fold in which beds are inclined away from the fold axis; a syncline is an elongated fold in which beds are inclined toward the fold axis. Symbol short-dashed where inferred or concealed

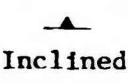


Inclined



Overturned

Strike and dip of bedding in sedimentary rocks



Inclined



Vertical

Strike and dip of foliation in metamorphic rocks



Shaft



Prospect pit



Adit or tunnel



Line of geologic section