

Table 1.—Generalized stratigraphic and hydrogeologic nomenclature of Precambrian, Paleozoic, and Mesozoic rocks in the Upper Colorado River Basin [only Mesozoic formations immediately overlying the Paleozoic rocks are listed. Abbreviations used in this table include: Fm = Formation; Mbr = Member; Ss = Sandstone; Ls = Limestone; Dol = Dolomite; Sh = Shale. Colors relate component geologic units to hydrogeologic units and are symbolic of the predominant lithology in the hydrogeologic unit: yellow and brown indicate sandstone and quartzite; shades of green indicate mostly shale; shades of blue indicate mostly carbonate rocks; other colors indicate mixed lithology. Contacts within series are generalized]

| ERA OR ERATHEM | PERIOD OR SYSTEM   | EPOCH OR SERIES | SOUTHWESTERN WYOMING |                      |                | NORTHWESTERN COLORADO |                     |               | NORTHEASTERN UTAH            |                          |                  | SOUTHEASTERN UTAH     |                          |                 | NORTHEASTERN ARIZONA |                       | SOUTHWESTERN COLORADO |                       | HYDROGEOLOGIC UNIT   | MAXIMUM THICKNESS, IN FEET                                   |
|----------------|--------------------|-----------------|----------------------|----------------------|----------------|-----------------------|---------------------|---------------|------------------------------|--------------------------|------------------|-----------------------|--------------------------|-----------------|----------------------|-----------------------|-----------------------|-----------------------|--|--|
|                |                    |                 | Overthrust Belt      | Wind River Mountains | Rawlins Uplift | Eastern Eagle Basin   | White River Plateau | Elk Mountains | Southeastern Uinta Mountains | Southwestern Uinta Basin | San Rafael Swell | Henry Mountains Basin | Northern Monument Upwarp | Marble Platform | Defiance Plateau     | Four Corners Platform | San Juan Mountains    |                       |  |  |
| MESOZOIC       | JURASSIC           | Late or Upper   |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       | Not discussed in this report. (See Freethy and Cordy, 1991). | Not discussed in this report. (See Freethy and Cordy, 1991). |
|                |                    | Middle          |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                |                    | Early or Lower  |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                | TRIASSIC           | Late or Upper   |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       | Not discussed in this report. (See Freethy and Cordy, 1991). | Not discussed in this report. (See Freethy and Cordy, 1991). |
|                |                    | Early or Lower  |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                | PALEOZOIC          | PERMIAN         | Late or Upper        | Guadalupian          |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  | Carnian-Mississippian  |
| Leonardian     |                    |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
| Wolfcampian    |                    |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
| PENNSYLVANIAN  |                    | Late or Upper   | Virgilian            |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       | Carnian-Mississippian  | 16,500   |
|                |                    | Missourian      |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                |                    | Middle          | Desmoinesian         |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                |                    | Atokan          |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                |                    | Early or Lower  | Morrowan             |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                |                    | Chesterian      |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
| MISSISSIPPIAN  |                    | Late or Upper   | Meramecian           |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       | Carnian-Mississippian  | 4,300  |
|                |                    | Osagean         |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                |                    | Early or Lower  | Kinderhookian        |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                | Late or Upper      |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                | Early or Lower     |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                |                    |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
| DEVONIAN       | Late or Upper      |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       | Carnian-Mississippian | 700  |  |
|                | Early or Lower     |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                |                    |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
| SILURIAN       | Late or Upper      |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       | Carnian-Mississippian | 3,000  |  |
|                | Middle             |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                | Early or Lower     |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
| ORDOVICIAN     | Late or Upper      |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       | Carnian-Mississippian | 1,100  |  |
|                | Middle             |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                | Early or Lower     |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
| CAMBRIAN       | Late or Upper      |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       | Carnian-Mississippian | 800  |  |
|                | Middle             |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                | Early or Lower     |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
| PRECAMBRIAN    | Late Proterozoic   |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       | Carnian-Mississippian | Not discussed in this report. (See Hedge and others, 1986).  |  |
|                | Middle Proterozoic |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                | Early Proterozoic  |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |
|                | Late Archean       |                 |                      |                      |                |                       |                     |               |                              |                          |                  |                       |                          |                 |                      |                       |                       |                       |  |  |

FOOTNOTES

- As suggested by McKelvey and others (1959), designation of the rocks of Park City/Phosphoria age as either "Park City Formation" or "Phosphoria Formation" is based on the predominant rock types, and each formation can include tongues of the other. Members of the Park City Formation are denoted by the letter *a*; members of the Phosphoria Formation are denoted by the letter *b*.
- Of Shaw (1957), included in Open Door Limestone in some reports (for example, Keefer and Van Lieu, 1966).
- Of Maughan (1980); also called South Canyon Creek Member (by Freeman, 1971, for example).
- Of Johnson (1989); formerly considered a member of the State Bridge Formation (Freeman, 1971).
- Of Langenheim (1952); also called "Mintum Formation."
- The name "Mackenzie Tongue of Woodside Shale" as used by McKelvey and others (1959), is applied to a sequence of red shale within the Park City Formation in the Uinta Mountains, even though the Woodside Shale generally is considered to be Triassic. Therefore, either the Mackenzie Tongue is not a tongue of the Woodside Shale, or the Woodside Shale is partly Permian.
- As indicated by Hallgarth (1959) and correlations made during this study, the lowermost beds of the Madison Limestone in the southeastern Uinta Mountains correlate with the uppermost beds of the Dyer Dolomite of northwestern Colorado. Therefore, either the uppermost Dyer Dolomite is Mississippian, as shown here, or the lowermost Madison Limestone in the southeastern Uinta Mountains is Late Devonian.
- According to Untermaier and Untermaier (1954), fossils from the upper (shaly) part of the Lodone Formation where it crops out in the southeastern Uinta Mountains date the upper part of the Lodone Formation (an equivalent of the Gros Ventre Formation) as Late Cambrian. However, the lower part of the Lodone Formation (an equivalent of the Flathead Sandstone, Sawatch Quartzite, and Tintic Quartzite) is unfossiliferous. The age of the lower part of the Lodone Formation here is inferred to be Middle and Late Cambrian from its geographic position relative to equivalent quartzite/sandstone units. These formations range from Middle Cambrian on the north and west to Late Cambrian on the east.
- Even though the Morgan Formation is considered to be Middle Pennsylvanian where it crops out in the Uinta Mountains (for example, Hansen and others, 1983), it can be traced southward in the subsurface into beds of the Elephant Canyon Formation of Baars (1962). Because the Elephant Canyon Formation is Early Permian where it crops out in the Monument Upwarp, both the Morgan and Elephant Canyon Formations must be Pennsylvanian and Permian in age where they merge (north of the San Rafael Swell).
- The Round Valley Limestone correlates in the subsurface with the Eagle Valley Evaporite and the Paradox Member of the Hermosa Formation, both of which are Middle Pennsylvanian in age. Because the Round Valley Limestone where it crops out in the Uinta Mountains is Early Pennsylvanian, it is inferred to be time-transgressive in the subsurface. Hence, in the southwestern Uinta basin, where it merges with the Paradox Member, the Round Valley Limestone is interpreted to be Early and Middle Pennsylvanian. Similarly, the Doughnut Shale (Formation) is interpreted to be time-transgressive and is considered Late Mississippian and Early Pennsylvanian in the southwestern Uinta basin.
- The Cutler Formation in southeastern Utah becomes divisible into several distinct units, to which the U.S. Geological Survey assigns member rank. Baars (1962), however, assigned these units formation rank and the Cutler group rank, in southeastern Utah. A sequence of carbonate and clastic rocks that grades into the lowermost shaly beds of the Cutler was designated by Baars (1962) as the Elephant Canyon Formation. The nomenclature of Baars (1962) regarding the Cutler rocks is used in this report.
- Cambrian units cropping out in the Grand Canyon, the Tapeats Sandstone, Bright Angel Shale, and Muav Limestone, were traced during this study into northeastern Arizona and southwestern Colorado by means of borehole lithologic logs. Because no names for the shale and carbonate units currently are recognized by the U.S. Geological Survey in Colorado, the names "Bright Angel equivalent" and "Muav equivalent" were used beyond the Grand Canyon area where rocks characteristic of the Bright Angel Shale and Muav Limestone, respectively, were identified. An equivalent of the Tapeats Sandstone crops out in the San Juan Mountains of Colorado, where it is called the Ignacio Quartzite. In this report, an axis of thinning in southwestern Colorado was considered the boundary between the extension of the Tapeats Sandstone beyond the Grand Canyon area, the "Tapeats equivalent," and the Ignacio Quartzite. As shown by Baars (1983, p. 54), the Cambrian geologic units become progressively younger from the Grand Canyon to the San Juan Mountains. Hence, in the Defiance Plateau and Four Corners platform columns, the ages of the Tapeats equivalent, Ignacio Quartzite, Bright Angel equivalent, and Muav equivalent are depicted as intermediate between ages in outcrop areas to the west and east.
- Excluding salt diapirs of small areal extent that can be as much as 15,000 feet thick.
- Although Precambrian rocks do not crop out and have not been penetrated by boreholes in the Overthrust Belt within the Upper Colorado River Basin, Archean granitic and metamorphic rocks are exposed in the Farmington complex, about 30 miles west of the Utah-Wyoming State line (Byrnes, 1988).