Table 1. Compilation of stratigraphic and other information for localities of Bishop ash and Bishop Tuff of the Western United States

[Localities are listed in alphabetic order, first by State and then by County, and number keyed to the map showing the distribution of the ashes. Most sample numbers refer to collections of ash made by G.A. Izett (for example, 74G3) or by R.E. Wilcox (for example, 68W156) giving the year and sample number. Other sample numbers refer to collections of ash made by other geologists. Leaders (---), sample currently not available to the authors; closely spaced sample localities given same locality number]

Loc. No. (fig. 1)	Sample Nos.	County	Location and quadrangle	Remarks
			Bishop Tuff, California	
1	64W96, 79G14, 79G75, 79G77, 79G78, 79G81, 79G82, 79G83, 80G23, BT-8	Inyo	NW1/4NE1/4 sec. 4, T. 6 S., R. 33 E.; Bishop 15-minute.	Pumice lapilli from 4-m-thick air-fall unit (fig. 2) at base of the Bishop Tuff at the Insulating Aggregates Co. pumice quarry (abandoned) about 10 km north of Bishop, Calif. (Tucker, 1927; Bateman, 1953, p. 1499-1500; 1965, p. 151-155, fig. 65; Chesterman, 1956, p. 60, fig. 16; Dalrymple and others, 1965, sample no. 4G001; Izett and others, 1970, log. 1; Sarna-Wojcicki and others, 1980, table 3, sample no. 8; 1984, fig. 1, loc. 8). Pumice lapilli are angular, poorly sorted, and as much as 6 cm in diameter. Bedding in unit is reversely graded and contains evenly distributed lithic fragments whose average size is only about 2-3 mm. Even distribution of lithic fragments through unit indicates that it was not deposited in standing water (see Bateman, 1953; 1965, p. 151-155).
1	79G15, 79G79, 79G80, 79G84, 80G21	Inyo	NW1/4NE1/4 sec. 4, T. 6 S., R. 33 E.; Bishop 15-minute.	Rounded pumice cobbles from the lowest part of the main thick ashflow at Insulating Aggregates Co. pumice quarry about 10 km north of Bishop, Calif. (fig. 2). Sample no. 80G21 is from a thin lenticular ash flow that underlies the surge deposit.
2	79G21	Inyo	SW1/4SW1/4 sec. 20, T. 6 S., R. 32 E.; Bishop 15-minute.	Pumice lapilli from about middle of the basal, air-fall unit of the Bishop Tuff at cliff exposures north of the Owens River. Characteristics of unit strikingly similar to those at Insulating Aggregates Co. quarry.
3	79G85	Inyo	SE1/4 sec. 14, T. 8 S., R. 33 E.; Bishop 15-minute.	Pumice lapilli from air-fall unit at the base of the Bishop Tuff. Exposed in pumice quarry at base of White Mountains.
3	79G86	Inyo	SE1/4 sec. 14, T. 8 S., R. 33 E.; Bishop 15-minute.	Rounded pumice fragments as much as 15 cm in diameter from lower part of basal ash flow. Questionably assigned to Bishop Tuff. Contains significantly greater Fe compared to Bishop Tuff (table 5).
5	J-328	Madera	See Sarna-Wojcicki and others (1980) for location; Devils Postpile 15-minute.	Air-fall pumice from base of ash flow previously called the tuff of Reds Meadow. Assigned to the Bishop Tuff by Hildreth (1977, p. 296).
4	64W109	Mono	NE1/4SE1/4 sec. 10, T. 2 S., R. 31 E.; Glass Mountain 15-minute.	Pumice lapilli from a prospect trench in the basal, air-fall unit of the Bishop Tuff about 1.6 km southwest of Benton Hot Springs, Calif. Just west of California State Highway 121. Collector R.E. Wilcox.
6	69W140	Mono	SE1/4 NW1/4 sec. 34, T. 4 S., R. 30 E.; Casa Diablo Mountain 15-minute.	Pumice lapilli from the basal, air-fall unit of the Bishop Tuff in roadcut along U.S. Highway 395. Collector R.E. Wilcox.
7	79G88	Mono	NW1/4 sec. 25, T. 1 S., R. 29 E.; Glass Mountain 15-minute.	Pumice blocks 0.5 m in diameter from ash-flow tuff of the upper, pyroxene-bearing part of the Bishop Tuff. Near loc. B-138 of Hildreth (1977, p. 299).
7	79G94	Mono	NE1/4 sec. 27, T. 1 S., R. 29 E.; Glass Mountain 15-minute.	Pumice block about 1.0 m in diameter from ash-flow tuff of the upper, pyroxene-bearing pumice unit of the Bishop Tuff. Near loc. B-137 of Hildreth (1977, p. 299).
3	79G87	Mono	SE1/4NE1/4 sec. 3, T. 5 S., R. 33 E.; White Mountain Peak 15-minute.	Rounded pumice lumps from the middle of a deposit at the Sacramento pumice mine (Chesterman, 1956, p. 61). Rounding of pumice lumps suggests that the deposit is not air-fall material. Hildreth (1977, p. 296) was uncertain if the deposit should be assigned to the Bishop Tuff. If the pumice is Bishop Tuff, and it may not be, it is unusual in several respects: the pumice is very frothy, uncommonly coarse grained (pumice fragments are as much as 25 cm in diameter), and the iron content of the glass of pumice significantly greater than iron content of glass of the air-fall pumice of the Bishop Tuff and Bishop ash beds (table 5).
			Bishop ash, California	
8	68W156, 74G3	Inyo	SE1/4SW1/4 sec. 29, T. 22 N., R 7 E.; Shoshone 15-minute.	Ash 15 cm thick in sediments of Pleistocene Lake Tecopa exposed at road level about 1.9 km east of Shoshone, Calif., along the road to Pahrump, Nev. Same locality as that of Sheppard and Gude (1968, p. 13, no. 3). Other localities of Bishop ash are in nearby areas such as in the NW1/4 sec. 30, T. 22 N., R. 7 E. along the west side of a road in the northern part of Shoshone, Calif. A Lava Creek B ash bed (previously called Pearlette type O ash) is about 6 m above the Bishop ash bed in the area (Izett and others, 1970, p. 130, no. 3; Borchardt and others, 1972). See also Hillhouse and Cox (1976) for descriptions of the magnetostratigraphy of the Pleistocene deposits of Lake Tecopa. Sarna-Wojcicki and others (1980, table 1, sample no. 9; 1984, tables 2 and 4, loc. 9) listed chemical analyses of the ash.
9	---	Imperial	NW1/4 SW1/4 sec. 19, T. 9 S., R. 12 E.; Durmid 7 1/2-minute.	Composite ash bed 2 m thick, consists of reworked, water-redeposited ash and thin silt beds described by Sarna-Wojcicki and others (1980, table 1, sample nos. 6, 7, 12, and 15; 1984, table 4). Another loc. of ash assigned to the Bishop ash bed by Merriam and Bischoff (1975, p. 210, loc. 1) occurs in NW1/4 sec. 34, T. 8 S., R. 11 E.
11	---	Kern	About 16 km northwest of Wasco, Calif.	Thin volcanic ash at a depth of 84 m in borehole H-35 in the Turlock Lake Formation (Pleistocene). Locality described by Davis and others (1977, p. 385), who reported a K-Ar age of 0.942±0.010 m.y. for the ash (glass shards only?). This ash identified by Davis and others (1977) as a Bishop ash bed. A. M. Sarna-Wojcicki (written commun., 1981) believed that the ash is not a Bishop ash because the chemical composition, index of refraction, and shape of glass shards are significantly different than those of other Bishop ash beds.
10	70W4	Kings?	Precise locality unknown to authors.	Ash from borehole at a depth of 165 m in the Corcoran Clay Member of the Turlock Lake Formation (R. J. Janda of the U.S. Geological Survey, written commun., 1970).
49	70W1, 79G74	Madera	NE1/4 sec. 1, T. 11 S., R. 20 E.; Millerton Lake West 7 1/2-minute.	Bed 3 m thick. Very fine grained ash bed that underlies a conglomeratic sandstone unit. The ash bed is currently being mined by the California Industrial Minerals mine near Friant, Calif. (Chesterman, 1956, p. 35). The iron content of the glass of this ash is significantly less than that of the air-fall pumice of the Bishop Tuff and Bishop ash beds.
12	---	Riverside	SW1/4NW1/4 sec. 7, T. 7 S., R. 3 W.; Murrieta 7 1/2-minute.	Deposit 2-3 m thick, in Pleistocene alluvium north of Chaney Hill, mapped and described by Kennedy (1977, p. 4-5). Chemical analyses of the ash given by Sarna-Wojcicki and others (1980, table 1, sample no. 10; 1984, tables 2 and 4) who stated (1980, p. 29) that this locality is "at or close to" another locality of ash identified and listed by Merriam and Bischoff (1975, p. 210, loc. 6) as Bishop ash.
13	---	Riverside	SE1/4 sec. 17, T. 6 S., R. 9 E.; Thermal Canyon 7 1/2-minute.	Ash bed in fine-grained sandstone and siltstone of the Palm Spring Formation (Pliocene and Pleistocene). Identified as Bishop ash by Merriam and Bischoff (1975, p. 210, loc. 2).
			Bishop ash, California—Continued	
14	---	Riverside	SE1/4SW1/4 sec. 32, T. 6 S., R. 3 E.; Idyllwild 15-minute.	In Pleistocene alluvium north of Anza, Calif. See Sarna-Wojcicki and others (1980, table 1, sample no. 11; 1984, tables 2 and 4) for locality information and chemical analyses of the ash. Sarna-Wojcicki and others (1980, p. 29) reported that this ash locality is at or close to another locality of ash identified by Merriam and Bischoff (1975, p. 210, loc. no. 4) as a Bishop ash.
15	---	Riverside	W 1/2 sec. 30, T. 3 S., R. 15 E.; Coxcomb Mountains 15-minute.	Ash bed in dissected alluvial fan identified as Bishop ash by Merriam and Bischoff (1975, p. 210, loc. no. 7).
16	---	San Bernardino	NE1/4 sec. 1, T. 10 N., R. 4 E.; Newberry 15-minute.	Ash in alluvial fan; identified by Merriam and Bischoff (1975, p. 210, loc. no. 8) as Bishop ash.
17	---	San Diego	NW1/4NE1/4 sec. 24, T. 9 S., R. 5 E.; Clark Lake 15-minute.	In fluvial Pleistocene sediments in Anza-Borrego area. Locality data and chemical analyses of ash given by Sarna-Wojcicki and others (1980, table 1, sample no. 5; 1984 tables 2 and 4). According to them (1980, p. 29), this ash locality is at or near one identified by Merriam and Bischoff (1975, p. 210, loc. no. 3) as Bishop ash.
18	---	San Diego	Sec. 20, T. 10 S., R. 3 E., Warner Springs 7 1/2 minute.	Ash in sediments of Warner Basin; identified as Bishop ash by Merriam and Bischoff (1975, p. 210, loc. no. 5).
19	---	Tulare	NW1/4NE1/4 sec. 16, T. 23 S., R. 24 E.; Alpaugh 7 1/2-minute.	From a Bureau of Reclamation borehole. Locality information and chemical analyses of the ash given by Sarna-Wojcicki and others (1980, table 1, sample no. 2).
20	---	Ventura	Lat 34° 17' 56'' N., long 119° 16' 58'' W.; Ventura 7 1/2-minute.	Interbedded in Santa Barbara Formation near Ventura, Calif. Another locality of Bishop ash is at lat 34°17'57'' N., long 119°15' 48'' W. Locality information and chemical analyses given by Sarna-Wojcicki and others (1980, table 1, sample nos. 3 and 4; 1984, tables 2 and 4).
			Bishop ash, Colorado	
23	80W90	Alamosa	E1/2 sec. 10, T. 36 N., R. 11 E.; Alamosa East 7 1/2-minute.	Lens of impure ash 0 to 5 cm thick, interbedded in the Alamosa Formation (middle Pleistocene) at Hansen Bluff southeast of Alamosa, Colo. Sample submitted by Karel Rogers of Adams State College (written commun., 1980).
21	65W131, 83G2	Chaffee	SW1/4SW1/4 sec. 9, T. 51 N., R. 8 E.; Poncha Springs 15-minute.	Impure ash, 5 cm thick in roadcut (west side) of U.S. Highway 285 near Centerville Cemetery, in overbank silt overlying Nebraskan(?) age terrace deposit of Arkansas River of Scott and others (1975). Gravel no. 2 of Van Alstine (1969, p. 23), 80 m above modern flood plain of the Arkansas River. A Lava Creek B ash (called Pearlette Type O by Izett and others, 1970) is in the next lower (younger) terrace. See Izett and others (1970, p. 131, loc. no. 9).
22	65W1	Montrose	SE1/4NW1/4 sec. 26, T. 48 N., R. 19 W.; Roc Creek 7 1/2-minute.	Impure ash, 0 to 8 cm thick, in Pleistocene deposits in the northern part of Paradox Basin, about 3.2 km northeast of Paradox, Colo. (Cater, 1970, p. 49).
24	80W92	Saguache	SE1/4SE1/4 sec. 32, T. 45 N., R. 11 E.; Mirage 7 1/2 minute.	Impure ash in Pleistocene fan deposit. Ash smeared out in fault zone separating fan deposit from bedrock. Minimum post-Bishop ash (0.74 m.y.) fault movement about 10 m. Collected by S.M. Colman of the U.S. Geological Survey.
			Bishop ash, Idaho	
25	78W218, 78W217	Bannock	NE1/4 sec. 33, T. 12 S., R. 38 E.; Oxford 7 1/2 minute.	Interbedded in pre-Lake Bonneville fan deposit of middle Pleistocene age. A Lava Creek B ash is stratigraphically above. Locality southeast of Red Rock Pass 1 km from where power lines cross gully. Another Bishop ash is nearby in the NW1/4 sec. 33, T. 12 S., R. 38 E. in pre-Lake Bonneville fan deposits beneath a $CaCO_3$ zone. Locality at top of gully north of house in NW1/4 sec. 33, T. 12 S., R. 37 E. Collected by R.C. Bright of the University of Minnesota (written commun., 1979).
26	78W17	Bingham	NW1/4SE1/4 sec. 11, T. 4 S., R. 37 E.; Yandell Springs 15-minute.	Impure ash 0.5 m thick, interbedded in Pleistocene loess-like silt. Three other ash beds occur stratigraphically above; one of the three ash beds is a Lava Creek B ash bed. At Ash Hill north of the Gay Mines on the west side of haulage road. Collected by and locality information from K.L. Pierce of the U.S. Geological Survey (written commun., 1978).
			Bishop ash, Nebraska	
27	66W8, 71W9	Nuckolls	NE1/4SE1/4 sec. 26, T. 3 N., R. 8 W.; Mount Clare 7 1/2-minute.	Ash 0.7 m thick. In the Pleistocene Sappa Formation of Miller and others (1964, p. 79).
			Bishop ash, Nevada	
29	70W19, 70W23-70W27	Esmeralda	NE1/4NE1/4 sec. 17, T. 2 S., R. 40 E.; Silver Peak 15-minute.	Pumice lapilli from a borehole at a depth of 104-107 m, just north of Angel Island. Sample submitted by R. Nelson of the Foote Creek Mineral Co. (written commun., 1970).
28	---	Mineral	NE1/4NW1/4 sec. 24, T. 12 N., R. 28 E.; Schurz 15-minute quadrangle.	Ash lens about 10 cm thick in gravel about 6.5 km south of Schruz, Nev. Assigned to the Bishop ash bed by Davis (1977, p. 100, sample no. JOD26).
30	78G203	Nye	Lat 36°51' N., long 116°19.5' W.; Jackass Flats 7 1/2-minute.	Ash, 0.3 m thick. In Pleistocene alluvium. Collected by A.G. Gordon of Fenix and Scisson Co. and W.J. Carr of the U.S. Geological Survey (written commun., 1978). Sample no. TSV132-28.
31	79W61	Nye	NW1/4SE1/4 sec. 26, T. 15 S., R. 50 E.; Lathrop Wells 15-minute.	Ash, 0.5 m thick. Interbedded in Pleistocene eolian sand unit. Collected by Swadley (1983).
31	79G4	Nye	NE1/4NE1/4 sec. 21, T. 15 S., R. 50 E.; Striped Hills 7 1/2-minute.	Impure ash, 1 m thick in Pleistocene alluvium. Described by Swadley (1983).
32	79W92	Nye	Lat 36°53' N., long 116°22.5' W.; Topopah Spring 7 1/2-minute.	Ash, 0 to 0.5 m thick in Pleistocene alluvium on the east side of Fortymile Canyon. Locality found by A.G. Gordon (written commun., 1979). Sample no. AG 109-36.
33	80W70, 80W71	Nye	Lat 36°43.5' N., long 116°36' W.; Big Dune 15-minute.	Ash, in Pleistocene eolian sand. Two closely spaced localities found by W.J. Carr (written commun., 1980). Sample nos. SW11-80 and SW12-80 collected by W C Swadley, U.S. Geological Survey.
			Bishop ash, Nevada—Continued	
50	85G1	Nye	Lat 36°46' N., long 116°26' W.; Busted Butte 7 1/2-minute.	Impure ash in Pleistocene eolian sand. Found and collected by J.W. Whitney, U.S. Geological Survey (written commun., 1985). According to Whitney, this ash bed overlies another ash herein tentatively correlated with the Glass Mountain-D ash bed.
			Bishop ash, New Mexico	
34	71W25-71W28, 73W101	Dona Ana	NW1/4NW1/4 sec.15, T. 18 S., R. 2 W.; Rincon 7 1/2-minute.	Ash, 0.3 m thick in Camp Rice(?) Formation of Strain (1973), in gully 60 m west of railroad mile post 1074 near Grama Siding of the Santa Fe Railroad, 8 km north of Rincon, N. Mex. Collected by J. W. Hawley of the New Mexico Bureau of Mines and Mineral Resources. Zircon fission-track age of 0.75±0.2 m.y. reported by Kortemeier (1982).
35	70W156, 71W29-71W32	Dona Ana	SW1/4NE1/4 sec. 28, T. 26 S., R. 4 E.; Anthony 7 1/2-minute.	Ash, 0 to 15 cm thick in the piedmont slope facies of the Camp Rice Formation, interlayered in a sand unit in fanglomerate. Exposed in 1970 in a pipeline trench about 1 km west northwest of Anthony Gap. Collected by R.G. Dickinson of the U.S. Geological Survey. Recollected by J.W. Hawley.
			Bishop ash, Utah	
36	75L61, 80G15, 80G16	Beaver	SW1/4NW1/4 sec. 23, T. 27 S., R. 9 W.; Adamsville 15-minute.	About 3 m-thick-ash bed overlying coarse-grained alluvium. Xenolithic pumice lumps as large as 10 cm in diameter in upper part of bed. Pumice lumps derived from erosion of the rhyolite of the Mineral Mountains K-Ar dated at about 0.5 m.y. by Izett (1981, table 4). See Lipman and others (1978, p. 141) for description of the rhyolite of Mineral Mountains.
37	---	Box Elder	SE1/4SW1/4 sec. 1, T. 6 N., R. 6 W.; Pokes Point 7 1/2-minute.	Ash bed exposed in a borrow pit, the Southern Pacific Railroad Co. pit no. 2 in Little Valley. Ash assigned to the Bishop ash by Eardley and others (1973, p. 213). A Lava Creek B ash bed occurs stratigraphically higher to the northeast in the pit according to H.D. Goode, University of Utah (written commun., 1975). See also Nash and Smith (1977, table 4, no. 18).
38	65W5, 78G197	Grand	SE1/4NE1/4 sec. 26, T. 24 S., R. 24 E.; Polar Mesa 15-minute.	Ash bed, 1 m thick in the lower member of the Harpole Mesa Formation (Richmond, 1962, p. 34). See Izett and others (1970, p. 131, no. 7b). See Sarna-Wojcicki and others (1980, table 1, no. 16) for analyses of the ash. See also Nash and Smith (1977, table 4, no. 25).
47	82W40, 82W43, 83W19	Grand	NW1/4SE1/4 sec. 7, T. 24 S., R. 22 E.; Moab 15-minute.	Lenticular thin bed in Pleistocene terrace deposit along Salt Valley Wash. Collected by S.M. Colman of the U.S. Geological Survey in 1982, C.G. Oviatt of the Utah Geological and Mineralogical Survey in 1983, and J.H. Hanley of the U.S. Geological Survey in 1983. According to Oviatt, the Bishop is overlain by an ash identified by G. A. Izett as Lava Creek B.
47	82W39	Grand	NW1/4SE1/4 sec. 12, T. 24 S., R. 22 E.; Moab 15-minute.	Lenticular thin bed in Pleistocene terrace deposit along Salt Valley Wash. Collected by J.H. Hanley of the U.S. Geological Survey in 1983.
39	79G39	Millard	NW1/4NW1/4 sec. 24, T. 15 S., R. 7 W.; Rain Lake 7 1/2-minute.	About 30-cm-thick ash bed interbedded in Pleistocene alluvium exposed about 70 m from the west end of an exploratory trench dug in 1979. Ash about 2 m below land surface. Sample submitted by R. Patterson of Dames and Moore. Samples of the ash recollected by C.D. Miller and W.E. Scott of the U.S. Geological Survey. A fission-track age determined on zircon from the ash is 0.73±0.13 (2 sigma) m.y. (C.W. Naeser, written commun., 1979).
40	79W84, 80W84	Millard	NE1/4NE1/4 sec. 32, T. 20 S., R. 12 W.; Long Ridge SW 7 1/2-minute.	Ash bed, 3 to 5 cm thick in Pleistocene deposits. Collected by C.G. Oviatt of the State of Utah Geological and Mineral Survey and W.E. Scott of the U.S. Geological Survey (written commun., 1979). Locality just south of Miller Canyon Reservoir.
41	75W58, 78G158, 78G159	Millard	SW1/4 sec. 31, T. 25 S., R. 6 W.; Cove Fort 15-minute.	About 0.3-m-thick ash bed in Pleistocene fan deposits in borrow pit. Separated from an overlying tephra bed called the Ranch Canyon ash bed (Izett, 1981) by about 10 m of sediments.
42	79W101	Millard	NW1/4NW1/4 sec. 23, T. 24 S., R. 10 W.; Black Rock 7 1/2-minute.	Ash, 15 cm thick overlying basalt K-Ar dated at 1.1 m.y. according to M. N. Machette and T. A. Steven of the U.S. Geological Survey (written commun., 1979).
43	57P129, 57P133	Salt Lake	SW corner sec. 24, T. 1 N., R. 3 W.; Saltair 7 1/2 minute.	Two ash beds separated by 3 m of sediments in borehole (Saltair) of Pleistocene Lake Bonneville at 194 and 197 m depths. Lower ash identified as Bishop ash by Izett and others (1970) and Eardley and others (1973, p. 213). Each ash about 0.3 m thick. A Lava Creek ash bed occurs about 31 m above in core. Sample submitted to H.A. Powers by A.J. Eardley of the University of Utah. See Eardley and Gvosdetsky (1960) for description of the core. See also Izett and others (1970, p. 131-132, no. 5b) and Nash and Smith (1977, table 4, no. 20).
43	---	Tooele	Near Burmester, Utah Burmester 7 1/2-minute.	Ash bed, 0.3 m thick in core from borehole (Burmester) in sediments of Pleistocene Lake Bonneville at depth of 86 m. Ash identified as Bishop ash on the basis of electron microprobe analysis of glass shards reported by Eardley and others (1973, p. 213). A Lava Creek B ash occurs about 10 m higher in core of the borehole; see Nash and Smith (1977, table 4, no. 19).
44	N-46	Tooele	About 11 km east of Wendover, Utah; no topographic map available.	Ash bed in sediments of Pleistocene Lake Bonneville in drill hole at a depth of 99 m. Collector, A. J. Eardley. See Izett and others (1970, p. 130, no. 4) and Nash and Smith (1977, table 4, no. 19).
45	64W130, 67W161, 80G18	Utah	SW1/4NW1/4 sec. 35, T. 9 S., R. 2 E.; Santaquin Peak 15-minute.	Ash bed, 0 to 2 m thick bed in Pleistocene deposits. A Lava Creek B ash occurs 0.3 to 0.5 m stratigraphically above about 1 km north of pond in a deep gully. Another locality of Bishop ash occurs in deep gully just below a pond. See Izett and others (1970, p. 131, no. 6) and Nash and Smith (1977, table 4, no. 26).
48	82W32	Wasatch	NW1/4NW1/4 sec. 18, T. 2 S., R. 5 E.; Park City East 7 1/2-minute.	Thin lenticular bed in Pleistocene deposits exposed along U.S. 40. Collected by Lucy Foley, U.S. Bureau of Reclamation.
			Bishop ash, Wyoming	
46	66W50, 74W24-74W25, 77G122	Albany	Center sec. 6, T. 14 N., R. 74 W.; Hutton Lake 7 1/2-minute.	Ash bed, 0 to 0.3 m thick ash interbedded in silt and sand of terrace alluvium along the west bank of the Laramie River, about 13 m above the modern flood plain of the river, at the Monolith Cement Co. quarry. Collected by Brainerd Mears Jr. of the University of Wyoming and R. E. Wilcox of the U.S. Geological Survey.

Table 5. Chemical analyses of the glass phases of some Bishop ash beds and Bishop Tuff tephra from the Western United States

[Localities plotted on figure 1 and described in table 1; analyses for all elements except Ca determined by the instrumental neutron activation method; Ca determined by atomic absorption photospectrometric method by V. Merrit; amounts of elements in parts per million except Fe and Ca, which are in weight percent; analyses of samples with laboratory numbers starting with the letter D made by D.M. McKown, R.J. Knight, and J.A. Budahn; analyses of samples with laboratory numbers composed only of numerals (730) made by G.A. Borchardt; other chemical analyses reported by Sarna-Wojcicki and others (1980); leaders (---) indicate no data; samples having identical field numbers and locality name, but different laboratory numbers, are splits of the same master sample but analyzed during different analytical runs; samples with the same locality name, but different field numbers, are from the same ash bed but at slightly different positions in the ash bed; LP, sample from lower part of bed; MP, sample from middle part of bed; UP, sample from upper part of bed; similarity coefficients (Borchardt and others, 1972) calculated by comparing Bishop ash beds against mean value for elemental abundance for Cs, Rb, Th, U, La, Yb, Ta, Hf, Mn, and Fe for samples of air-fall pumice from base of Bishop Tuff; samples analyzed by D.M. McKown, R.J. Knight, and J.A.Budahn; locality numbers same as figure 1]

Loc. No.	Lab. No.	Field No.	Locality and sampled material	Cs	Rb	Ba	Sr	Th	U	La	Ce	Nd	Sm	Eu	Gd	Tb	Dy	Tm	Yb	Lu	Ta	Zr	Hf	Sb	Sc	Mn	Fe	Ca	Similarity coefficient
			Bishop Tuff (From basal 4-m-thick air-fall unit)																										
1	D216903	79G14	IAQ[1], Calif.; MP; locality A; pumice lapilli---	4.5	150	55	143	17.7	7.7	15.4	29.8	14	3.5	0.05	2.3	0.49	3.5	---	2.2	0.32	2.4	122	3.0	0.9	2.6	227	0.46	0.29	---
1	D226477	79G75	IAQ, Calif.; LP; locality B; pumice lapilli------	5.4	164	38	---	19.6	7.6	16.4	39.1	17	3.9	.03	---	.70	3.6	---	2.6	.39	2.5	123	3.1	1.0	2.8	268	.47	---	---
1	D226478	79G77	IAQ, Calif.; MP; locality B; pumice lapilli------	5.4	165	32	---	19.9	7.9	16.8	39.7	19	3.9	.04	4.8	.67	3.7	0.32	2.7	.40	2.5	124	3.2	1.0	2.8	261	.48	---	---
1	D226479	79G78	IAQ, Calif.; UP; locality B; pumice lapilli------	5.4	168	39	---	20.4	8.1	18.3	43.6	20	4.4	.04	4.8	.66	3.9	.33	2.8	.44	2.7	126	3.3	1.1	2.9	263	.54	---	---
1	D226482	79G81	IAQ, Calif.; LP; locality C; pumice lapilli------	5.4	161	38	---	19.6	7.8	16.2	35.1	17	3.7	.02	4.4	.56	4.1	.34	2.6	.39	2.5	120	3.0	1.0	2.7	267	.46	---	---
1	D226483	79G82	IAQ, Calif.; MP; locality C; pumice lapilli------	5.4	157	40	---	19.3	7.5	17.6	35.1	17	3.8	.03	4.0	.59	4.2	---	2.5	.33	2.4	123	3.0	1.0	2.7	263	.49	---	---
2	D216906	79G21	Owens River, Calif.; MP; pumice lapilli----------	5.3	163	42	---	19.9	7.2	16.5	32.9	16	3.9	.03	4.2	.58	3.4	---	2.6	.38	2.5	---	3.2	1.0	2.8	257	.46	.30	---
3	D226486	79G85	Pumice pit, near Laws, Calif.; MP; pumice lapilli	5.4	154	61	---	18.7	7.7	16.8	34.3	17	3.8	.04	---	.55	3.8	---	2.4	.35	2.3	105	2.8	1.0	2.7	245	.48	---	---
			Mean[2]---------------------------	5.3	160	43	---	19.4	7.7	16.8	36.2	17	3.9	0.04	4.1	0.60	3.8	0.33	2.6	0.38	2.5	120	3.1	1.0	2.8	256	0.48	0.30	---
			± One standard deviation about mean	0.3	6	10	---	0.8	0.3	0.9	4.4	2	0.3	0.01	0.9	0.07	0.3	0.01	0.2	0.04	0.1	7	0.2	0.1	0.1	14	0.03	---	---
			Bishop Tuff (from basal 4-m-thick air-fall unit) [3]																										
1	20	64W96	IAQ, Calif.; MP; locality D; pumice lapilli------	6.5	163	54	---	19.6	7.0	18.4	35.0	15	4.4	0.04	---	0.34	4.2	---	1.8	0.48	2.2	57	3.6	1.1	2.6	257	0.51	0.29	---
1	730	64W96	--------do--------------------------------------	---	180	67	---	19.9	6.5	17.5	36.9	19	4.4	---	---	---	4.0	---	2.6	.52	2.5	---	4.1	---	2.8	266	.53	.30	---
1	NASW115	BT-8	IAQ, Calif.; 1 m below top of bed; pumice lapilli	6.0	187	---	---	21.0	6.7	19.4	47.1	20	3.7	.04	---	.56	4.1	---	2.7	.37	2.2	---	3.7	---	3.1	265	.54	---	---
2	922K	B-93	Owens River, Calif.; pumice lapilli[4]-------------	6.1	200	---	---	21.4	7.1	18.5	42.2	20	3.9	.04	---	.60	4.2	---	2.8	.37	2.2	---	3.9	---	2.9	281	.55	---	---
5	NASW3	J-328	Devils Post Pile quadrangle, Calif.; pumice lapilli[4]	6.1	185	---	---	21.9	7.2	18.3	42.1	18	3.8	.03	---	.63	4.0	---	2.9	.41	2.2	---	4.0	---	3.2	274	.50	.29	---
6	578	69W140	Roadcut near Toms Place, Calif.; MP; pumice lapilli	6.9	183	52	---	19.5	7.3	17.3	38.6	19	4.2	.06	---	---	4.2	---	2.5	.53	2.8	207	3.8	---	2.7	271	.51	.28	---
			Bishop Tuff (from surge deposit overlying basal air-fall unit)																										
1	D226484	79G83	IAQ, Calif.; surge deposit; MP; locality C; pumice lapilli	5.0	153	39	---	18.7	7.1	18.7	37.9	18	3.7	0.04	---	0.55	3.8	---	2.5	0.38	2.3	96	2.9	1.0	2.6	261	0.49	---	---
1	D229088	80G23	IAQ, Calif.; surge deposit; MP; locality E; pumice lapilli	5.7	162	---	---	19.7	7.0	19.7	36.1	16	3.8	.04	3.5	.55	3.5	---	2.3	.34	2.3	63	3.1	0.9	2.6	241	.48	---	---
			Bishop Tuff (from lowest ashflows of the lower part; nonpyroxene bearing pumice)																										
1	D216904	79G15	IAQ, Calif.; thick ash-flow unit; pumice lapilli--	4.6	150	---	---	18.2	8.2	22.9	45.6	17	3.9	0.04	3.6	0.52	3.0	---	2.3	0.34	2.2	124	3.1	0.9	2.5	241	0.50	0.31	---
1	D229087	80G21	IAQ, Calif.; lowest lenticular ash-flow; pumice lapilli	5.9	163	8	---	19.8	8.1	16.9	26.8	14	4.0	.03	---	.57	4.0	---	2.6	.37	2.5	---	3.1	1.0	2.8	265	.46	---	---
1	D226480	79G79A	IAQ, Calif.; thick ash flow unit; pumice lapilli---	5.3	159	37	23	19.1	7.4	18.7	40.7	20	3.9	.04	4.2	.65	3.4	0.31	2.6	.39	2.4	116	3.1	1.0	2.7	243	.47	---	---
1	D226485	79G84	IAQ, Calif.; thick ash flow unit; pumice lapilli---	5.0	144	39	96	17.8	6.6	21.5	39.3	18	3.7	.04	3.4	.50	3.6	---	2.3	.35	2.2	120	2.8	.9	2.5	250	.50	---	---
1	D226481	79G80	IAQ, Calif.; 4 m above 79G84; pumice lapilli-------	5.5	168	36	---	20.1	8.0	17.0	40.9	18	4.1	.03	4.3	.69	3.4	.33	2.7	.40	2.6	128	3.2	1.0	2.8	255	.44	---	---
3	D226487	79G86	Pumice quarry, near Laws, Calif.; LP, pumice lapilli[5]	5.3	150	124	46	18.2	6.9	18.7	36.5	14	3.6	.10	3.8	.55	3.9	.24	2.4	.34	2.2	113	2.8	.9	2.9	295	.64	---	---
3	D226488	79G87	White Mountain Peak quadrangle, Calif.; pumice lapilli[5]	5.3	159	81	---	19.8	7.6	19.3	39.8	19	4.1	.05	3.4	.56	3.6	---	2.6	.40	2.4	111	3.1	1.0	3.0	287	.61	---	
			Bishop Tuff (from lowermost ashflow of the upper part; pyroxene-bearing pumice)																										
7	D226489	79G88	Taylor Canyon, Calif.; lower part; pumice blocks----	2.5	90	237	---	12.3	2.8	50.6	79.5	23	3.1	0.19	2.4	0.30	1.9	0.16	1.1	0.18	1.1	105	2.8	0.5	1.4	116	0.35	---	---
7	D226492	79G94	Cowtrack Mountain quadrangle, Calif.; pumice block--	2.5	92	300	43	12.6	3.4	51.8	82.9	26	3.2	.22	2.7	.28	2.1	---	1.1	.18	1.1	110	3.0	.5	1.5	141	.41	---	---
			Bishop ash beds																										
8	7	68W156	Shoshone quadrangle, Calif.[4]------------------------	6.9	169	51	---	19.0	7.1	16.8	34.0	20	4.0	0.03	---	0.44	4.1	---	1.4	0.49	2.1	76	3.6	1.1	2.6	249	0.46	0.31	---
8	NASW183	Teco-5	Shoshone quadrangle, Calif.[4]------------------------	5.9	185	---	---	21.0	7.4	18.7	42.9	17	3.6	.04	---	.58	4.0	---	2.7	.36	2.1	---	3.8	---	3.0	254	.50	---	---
9	NASW71	S-5	Durmid 7 1/2-minute quadrangle, Calif.[6]------------	5.6	185	---	---	20.2	6.7	20.2	46.2	17	3.6	.04	---	.58	3.9	---	2.6	.35	2.1	---	3.7	---	2.9	266	.49	---	---
9	NASW116	S-1	Durmid 7 1/2-minute quadrangle, Calif.[7]------------	6.1	195	---	---	21.9	7.2	17.7	42.6	19	3.7	.03	---	.61	4.3	---	2.8	.39	2.2	---	3.8	---	3.2	272	.50	---	---
9	NASW63	S-2	Durmid 7 1/2-minute quadrangle, Calif.[8]------------	5.3	170	---	---	18.5	5.8	25.2	51.9	20	3.5	.06	---	.52	3.3	---	2.3	.33	1.9	---	3.5	---	2.7	245	.52	---	---
9	NASW117	S-2A	Durmid 7 1/2-minute quadrangle, Calif.[8]------------	5.6	178	---	---	20.1	6.5	21.6	48.6	18	3.6	.04	---	.55	3.7	---	2.5	.31	2.0	---	3.5	---	3.0	252	.52	---	---
49	D226476	79G74	Friant, Calif.; 3-m-thick ash bed------------------	4.7	151	50	---	17.9	6.8	21.7	46.5	18	3.6	.05	4.3	.58	3.4	0.28	2.4	.34	2.2	120	3.0	0.9	2.5	234	.40	---	0.89
49	D198717	70W1	--------do--------------------------------------	5.0	159	73	---	18.3	6.8	23.6	51.5	18	3.7	.06	---	.55	3.5	---	2.3	.28	2.3	131	3.2	1.0	2.5	223	.38	.29	.89
10	576	70W4	San Joaquin Valley, Calif.[4]----------------------	5.3	155	84	---	16.6	6.1	25.2	45.8	21	4.2	.08	---	.59	4.1	---	2.1	.45	2.4	132	3.2	1.2	2.3	239	.50	---	---
12	NASW75	ELSI1	Murrieta 7 1/2-minute quadrangle, Calif.[4]----------	5.4	181	---	---	19.8	6.5	20.3	46.6	18	3.6	.03	---	.57	3.7	---	2.6	.34	2.0	---	3.6	---	2.8	262	.50	---	---
14	NASW124	STRT2	Idyllwild 15-minute quadrangle, Calif.[4]------------	5.4	188	---	---	20.8	6.7	20.0	46.8	20	3.6	.04	---	.57	4.0	---	2.6	.37	2.1	---	3.6	---	3.0	266	.51	---	---
19	NASW4	232416B	Alpaugh 7 1/2-minute quadrangle, Calif.[4]-----------	5.3	169	---	---	19.0	6.1	25.0	52.2	17	3.6	.05	---	.52	3.5	---	2.4	.31	1.9	---	3.6	---	2.9	252	.54	---	---
21	22	65W131	Centerville, Colo.; middle part of thin, impure ash	6.5	158	130	---	18.1	6.2	24.8	40.6	22	3.9	.08	---	.61	3.3	---	1.6	.42	1.8	74	3.6	1.0	2.4	241	.53	.33	---
21	W222754	83G2	Centerville, Colo.; base of thin, impure ash--------	4.9	154	50	---	19.2	6.4	24.0	50.9	19	4.0	.07	3.7	.55	3.7	---	2.3	.29	2.4	64	3.4	1.0	2.6	247	.50	.33	.90
22	528	65W1	Near Paradox, Colo.; lower part--------------------	4.8	154	82	---	16.6	6.3	23.3	45.5	21	3.9	.07	---	.51	3.9	---	1.8	.46	2.1	94	3.7	.8	2.4	247	.50	.34	---
			Bishop ash beds—Continued																										
23	D229098	80W90	Near Alamosa, Colo.[4]--------------------------------	4.4	130	127	36	15.7	5.9	24.6	47.1	17	3.6	.08	3.2	.46	3.4	---	1.9	.29	1.9	---	2.7	.8	2.2	229	.47	.34	.81
24	D234834	80W92	San Luis Valley, Colo.; middle part of thin, impure ash	4.6	137	78	13	16.7	6.0	25.7	44.4	18	3.6	.09	---	.49	3.1	.33	2.0	.29	2.0	67	2.9	.8	2.3	234	.48	---	.84
25	D216900	78W217	Near Red Rock Pass, Idaho[4]-------------------------	4.5	148	60	---	18.1	7.3	20.9	38.5	16	3.7	.05	2.8	.51	2.9	---	2.4	.40	2.3	119	2.9	.9	2.6	248	.48	.31	.92
25	D216899	78W218	Near Red Rock Pass, Idaho[4]-------------------------	5.1	156	---	---	19.6	7.8	16.8	33.9	16	3.8	.02	---	.57	3.3	---	2.6	.35	2.4	124	3.1	1.0	2.7	261	.45	.31	.98
26	D198718	78W17	Gay Mines, Idaho; lower 10 cm of a 50-cm-thick bed--	5.7	172	45	---	20.1	8.0	17.2	38.8	18	4.0	.03	4.7	.64	4.7	.39	2.6	.37	2.6	---	3.4	1.2	2.8	252	.46	---	.96
27	D198716	71W9	Nuckolls Co., Nebr.; middle of thick, impure bed----	4.4	141	117	---	16.5	6.3	26.7	53.2	19	3.5	.09	4.5	.49	3.6	.31	2.0	.30	2.0	---	3.1	.9	2.2	218	.50	.38	.85
27	5	66W8	--------do--------------------------------------	5.3	151	102	---	15.9	5.7	27.3	50.7	25	4.4	.13	---	.57	3.0	---	2.0	.42	2.1	148	3.4	.9	2.2	230	.53	.33	---
27	505	66W8	--------do--------------------------------------	4.8	152	105	---	16.3	5.9	27.1	51.6	21	4.3	.10	---	.51	3.6	---	2.2	.42	2.1	88	3.6	.9	2.2	233	.55	---	---
27	541	66W8	--------do--------------------------------------	5.5	145	106	---	16.3	5.8	27.0	47.3	15	3.6	.10	---	.40	3.1	---	1.3	.39	1.7	75	3.2	.9	2.3	213	.54	---	---
27	D226494	66W8	Nuckolls Co., Nebr.; (coarse fraction; +120 -100 mesh); MP	4.3	132	112	---	16.2	5.8	30.3	54.4	20	3.6	.10	3.6	.46	3.2	.27	1.9	.29	1.9	113	3.0	.8	2.2	215	.52	---	.80
27	D226495	66W8	Nuckolls Co., Nebr.; (fine fraction; +200 -150 mesh); MP	4.4	131	86	---	16.4	5.9	27.6	47.9	19	3.5	.09	4.4	.45	3.1	.21	1.9	.29	1.9	115	2.8	.8	2.2	213	.50	---	.81
29	585	70W19	Clayton Valley, Nev.[4]------------------------------	6.5	181	63	---	17.4	6.6	21.6	44.6	21	4.6	.07	---	.70	5.3	---	2.1	.47	2.6	215	3.6	1.5	2.4	250	.49	.33	---
30	D216894	78G203	Jackass Flats, Nev.[4]-------------------------------	5.0	159	38	---	18.7	8.3	16.0	32.2	14	3.6	.02	3.9	.55	3.6	---	2.5	.37	2.4	124	3.0	1.0	2.6	253	.44	.30	.96
31	D216893	79W61	Skeleton Hills, Nev.[4]------------------------------	5.3	162	58	---	19.5	8.2	16.5	34.3	18	3.7	.02	---	.58	3.7	.31	2.7	.47	2.4	138	3.1	1.0	2.8	263	.47	.30	.98
31	D216896	79G4	Striped Hills, Nev.; lower part of 1-m-thick bed----	5.1	163	45	---	19.4	8.1	15.8	31.3	14	3.7	.03	3.2	.59	3.6	.30	2.5	.39	2.4	129	3.1	1.1	2.7	250	.46	.30	.97
32	D216942	79W92	Calico Hills, Nev.[4]--------------------------------	5.4	157	38	---	18.3	7.2	16.7	35.1	18	3.6	.03	3.8	.60	4.3	---	2.5	.41	2.2	124	2.9	1.0	2.7	234	.45	.29	.95
33	D229069	80W71	Big Dune quadrangle, Nev.[4]-------------------------	5.7	163	36	---	19.3	7.8	15.7	33.8	17	3.9	.04	4.1	.60	3.6	.38	2.4	.36	2.5	---	3.1	.9	2.7	256	.48	.36	.98
33	D229070	80W70	Big Dune quadrangle, Nev.[4]-------------------------	5.6	160	32	---	19.3	7.4	18.4	38.4	17	4.0	.04	4.0	.60	3.8	---	2.4	.38	2.4	---	3.3	1.0	2.8	253	.49	.32	.96
50	D263920	85G1	Flank of Busted Butte, Nev.-------------------------	5.4	161	---	---	20.4	6.8	17.7	37.9	15	3.9	.04	4.0	.59	4.0	.42	2.6	.36	2.6	126	3.4	1.0	2.8	272	.46	---	.95
34	D198713	73W101	Near Grama, N. Mex.; middle of 30-cm-thick bed------	4.6	151	74	---	16.9	6.3	27.1	56.3	20	3.6	.07	4.6	.49	3.5	.32	2.0	.32	2.1	---	3.1	.9	2.3	212	.50	.42	.85
34	D226497	73W101	Near Grama, N. Mex. (coarse fraction; +120 -100 mesh)	4.0	128	93	16	15.1	5.5	29.4	50.1	16	3.4	.09	---	.43	3.1	.20	1.7	.26	1.7	109	2.7	.7	2.1	219	.49	---	.77
34	D226498	73W101	Near Grama, N. Mex. (fine fraction; +200 -150 mesh)	4.5	140	76	---	16.1	5.5	27.7	52.9	18	3.5	.09	---	.56	3.3	---	2.0	.32	1.9	108	2.9	.8	2.2	219	.51	---	.81
35	D198712	70W156	Franklin Mountains, N. Mex.; middle of 5-cm-thick bed	3.9	127	110	33	14.7	8.6	25.1	50.2	19	3.2	.08	3.1	.44	3.1	.33	1.7	.21	1.8	---	2.8	.9	2.0	189	.45	.31	.78
35	723	70W156	--------do--------------------------------------	3.0	148	142	---	15.4	7.0	26.6	49.0	22	4.2	---	---	---	3.5	---	2.1	.39	1.9	---	3.4	---	2.1	202	.52	.31	---
36	D198708	75L61	Mineral Mountains, Utah; upper part of 2-m-thick bed	4.9	159	71	---	18.1	8.0	23.4	49.0	19	3.4	.06	3.9	.52	3.9	.40	2.2	.32	2.4	---	3.2	1.0	2.5	253	.50	.38	.93
36	D234833	80G15	Mineral Mountains, Utah; basal 5-10 cm of 2-m-thick bed	5.9	162	---	<96	19.6	7.6	16.4	32.8	16	3.5	.03	---	.59	3.8	.41	2.5	.37	2.5	68	3.1	1.0	2.7	261	.47	---	.98
38	19	65W5	Polar Mesa quadrangle, Utah; lowest 6 cm of 1-m-thick bed	5.4	153	68	---	17.9	6.9	18.0	31.3	18	3.9	.03	---	.37	3.7	---	1.5	.45	2.0	88	3.3	1.0	2.4	244	.44	.30	---
38	NASW149	65W5	--------do--------------------------------------	6.2	202	---	---	21.9	7.2	18.1	43.4	17	3.8	.03	---	.65	4.2	---	2.8	.42	2.3	---	3.7	---	3.2	279	.51	---	.90
39	D216895	79G39	Near Delta, Utah; lower part of 25-cm-thick ash bed	4.9	156	---	---	18.4	7.9	15.5	31.6	15	3.5	.03	---	.54	3.5	.27	2.4	.37	2.3	---	2.9	1.0	2.6	244	.44	.31	.94
40	D216901	79W84	Sevier Lake, Utah[4]---------------------------------	3.9	141	---	---	16.6	5.6	22.8	51.4	20	4.2	.04	2.8	.48	2.6	---	2.0	.29	2.1	---	3.1	.7	2.6	273	.49	.30	.85
40	D229085	80W84	Sevier Lake, Utah[4]---------------------------------	4.2	132	---	---	15.6	6.4	22.0	44.8	19	4.1	.05	2.7	.48	3.5	---	1.8	.26	2.0	107	2.9	1.0	2.5	266	.47	---	.84
40	D234856	80W84	Sevier Lake, Utah[4]---------------------------------	4.0	130	---	---	15.5	5.7	21.6	42.8	19	4.0	.04	3.0	.47	2.9	---	1.8	.26	1.9	---	2.9	.7	2.5	246	.47	---	.82
41	D198709	75W58	Near Cove Fort, Utah; MP----------------------------	5.5	170	---	128	19.5	8.6	16.3	35.1	15	3.4	.02	---	.60	4.6	.52	2.9	.37	2.5	---	3.2	1.1	2.7	276	.45	.31	.95
42	D225437	79W101	Near Black Rock, Utah;[4]----------------------------	6.5	161	39	---	18.5	7.2	15.4	33.3	14	3.4	.03	3.0	.58	3.4	---	2.5	.36	2.3	119	2.9	1.0	2.6	240	.47	---	.93
43	28	57P133	Near Saltair, Utah----------------------------------	6.0	147	49	---	17.0	6.5	22.4	38.9	21	4.0	---	---	.60	3.5	---	1.5	.40	1.9	81	3.3	.9	2.3	244	.52	.36	---
44	29	N-46	Near Wendover, Utah[4]-------------------------------	6.5	162	51	---	18.6	6.8	17.7	33.0	16	4.0	.04	---	.39	3.2	---	1.6	.45	2.1	91	3.4	1.1	2.4	238	.46	.31	---
45	27	67W161	Near Payson, Utah; lower 14 cm of 2.5-m-thick bed---	6.5	161	105	---	18.5	6.3	21.4	40.7	20	3.9	.04	---	.61	3.2	---	1.5	.45	2.1	95	3.7	1.1	2.5	244	.52	.31	---
45	D226496	67W161	--------do--------------------------------------	5.3	149	58	---	18.2	6.9	19.9	38.6	17	3.6	.05	---	.55	3.8	---	2.2	.32	2.2	107	2.9	1.0	2.5	266	.47	---	.92
45	D229086	80G18	Near Payson, Utah; lower 10 cm of 1-m-thick bed-----	5.8	159	---	---	19.4	7.6	15.8	32.9	14	3.8	.02	3.9	.58	3.7	.30	2.5	.35	2.4	112	3.1	1.0	2.7	258	.46	---	.97
47	W222781	82W39	Arches National Monument----------------------------	5.8	164	63	---	19.8	6.6	21.1	49.9	18	4.0	.04	---	.67	3.4	.42	2.4	.37	2.5	180	3.5	1.1	2.8	240	.50	---	.91
47	W222779	82W43	Near Moab, Utah-------------------------------------	5.3	161	35	---	19.9	6.7	20.1	42.4	17	4.0	.04	---	.59	4.0	---	2.5	.36	2.5	123	3.4	1.0	2.8	254	.49	---	.95
47	D256912	83W19	Near Moab, Utah-------------------------------------	5.0	150	51	---	19.1	6.1	20.8	46.8	17	3.9	.06	---	.55	3.5	---	2.4	.36	2.5	71	3.4	1.0	2.7	242	.50	---	.91
48	W222783	82W32	Keetley Valley, Utah--------------------------------	5.4	166	49	---	20.2	6.7	17.2	41.4	17	3.9	.03	---	.59	3.7	.42	2.5	.37	2.6	125	3.3	1.0	2.8	250	.49	---	.95
46	D198710	74W24	Near Laramie, Wyo.; lowest 6 cm of 25-cm-thick bed--	5.2	156	32	---	18.6	7.2	19.6	44.1	18	3.5	.04	3.4	.57	4.1	.39	2.3	.33	2.4	---	3.2	1.2	2.5	230	.47	.30	.94

[1]AQ, Insulating Aggregates Co. pumice quarry about 10 km north of Bishop, Calif., now abandoned.

[2]Mean of only those samples analyzed by D.M. McKown, R.J. Knight, and J.A. Budahn at the U.S. Geological Survey laboratory in Denver, Colo.

[3]Bishop Tuff, from basal 4-m-thick air-fall unit, analyzed by G.A. Borchardt or H.T. Bowman.

[4]Not known by us where sample was collected stratigraphically within the ash bed.

[5]Here questionably included with the Bishop Tuff; the iron and manganese contents are anomalously high compared to other Bishop Tuff samples.

[6]From 2-m-thick bed in the Borrego Formation (Babcock, 1974) in the Salton Trough; this sample referred to as the Insulating Aggregates Quarry type of Bishop ash by Sarna-Wojcicki and others (1980; 1984).

[7]From 2-m-thick bed in the Borrego Formation in the Salton Trough; this sample referred to as the Owens River Gorge type of Bishop ash by Sarna-Wojcicki and others (1980; 1984).

[8]From 2-m-thick bed in the Borrego Formation in the Salton Trough; this sample referred to as the Friant Pumice mine type of Bishop ash by Sarna-Wojcicki and others (1980; 1984).