USGS-OFR-90-87

USGS-OFR--90-87

DE91 000132

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

COMPILATION OF MODAL ANALYSES OF VOLCANIC ROCKS FROM THE NEVADA TEST SITE AREA, NYE COUNTY, NEVADA

by

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ABSTRACT

Volcanic rock samples collected from the Nevada Test Site, Nye County, Nevada, between 1960 and 1985 were analyzed by thin section to obtain petrographic mode data. The original mode data were recorded onto 5 x 7 in. index cards. In order to provide rapid accessibility to the entire database, all data from the cards were entered into a computerized database. This computer format will enable workers involved in stratigraphic studies in the Nevada Test Site area and other locations in southern Nevada to perform independent analyses of the data.

The data were compiled from the mode cards into two separate computer files. The first file consists of data collected from core samples taken from drill holes in the Yucca Mountain area. The second group of samples were collected from measured sections and surface mapping traverses in the Nevada Test Site area.

Each data file is composed of 1) computer printouts of tables with mode data from thin section point counts, 2) comments on additional data, and 3) location data. Tremendous care was taken in transferring the data from the cards to computer, in order to preserve the original information and interpretations provided by the analyzer.

In addition to the data files above, a file is included that consists of Nevada Test Site petrographic data published in other U.S. Geological Survey and Los Alamos National Laboratory reports. These data are presented to supply the user with an essentially complete modal database of samples from the volcanic stratigraphic section in the Nevada Test Site area.

INTRODUCTION

The contents of this report include modal classifications and associated data from samples collected between 1960 and 1985 from the Nevada Test Site (NTS) area (fig. 1), Nye County, Nevada. This database has been, and will continue to be an important source of information in defining petrologic zones and lithostratigraphic units used to establish the volcanic stratigraphic sequence in the NTS area.

Numerous U.S. Geological Survey geologists contributed to the modal database. The following personnel either collected samples or analyzed thin sections to obtain mode data; F.M. Byers Jr., W.J. Carr, R.L. Christiansen, S.F. Diehl, G.L. Dixon, F.N. Houser, P.W. Lipman, J.T. O'Connor, P.P. Orkild, W.D. Quinlivan, K.A. Sargent, R.B. Scott, and R.W. Spengler. As thin sections were analyzed, data was recorded onto 5 x 7-in. index cards, designed to define the sample based on a modal classification scheme.

The standard card used to record mode data is shown in figure 2. Most of the card contains percentages from the point count, and a small box in the lower right hand corner lists additional data (pumice, crystallinity, glomerophenocrysts, etc.). The cards were designed by F.M. Byers, Jr., in 1962. Bar-graph blanks are printed near the top of the card for graphical representation of different igneous rock mineral percentages useful for stratigraphic correlation. Vari-colored bar-

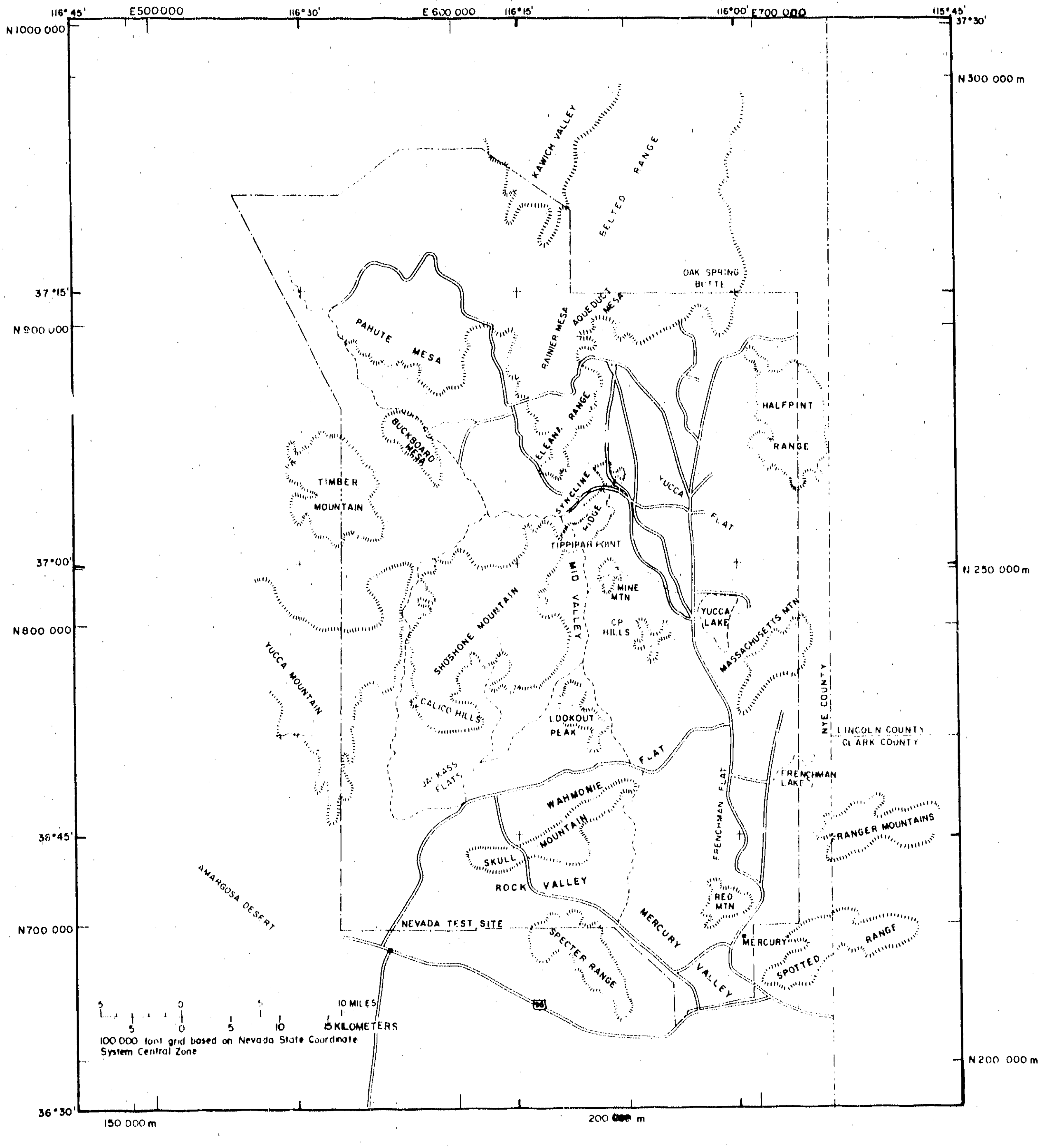

Figure 1. Map showing the Nevada Test Site and surrounding area.

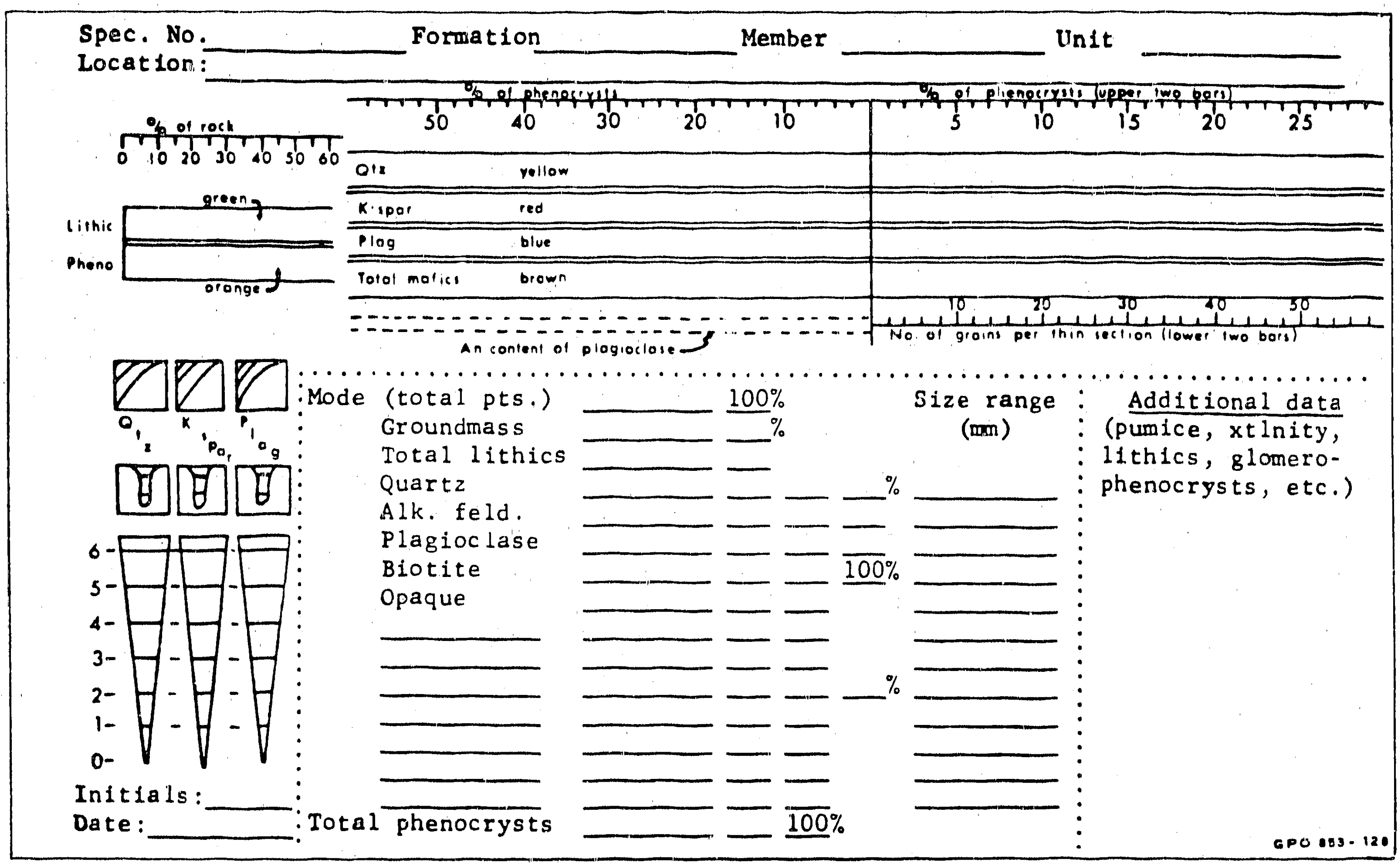

Figure 2. Standard card used for modal analyses.

graphs with mineral percentages were added, which could be displayed and examined to test for possible stratigraphic equivalents.

The mode data has been compiled into two computer-based files. The first group of data is referred to as the Yucca Mountain Drill Hole Sample Modes (appendix 1). The samples represented were collected from core and bit cutting samples from drill holes in the Yucca Mountain area. The exploratory drilling was conducted by the U.S. Department of Energy in order to determine the feasibility of selecting Yucca Mountain as the nation's first high-level nuclear waste repository. Samples were collected and analyzed from the following drill holes: USW G-1, G-2, G-3/GU-3, and G-4; USW H-3, H-4, H-5, and H-6; UE25 C#1, and C#2; USW WT-1, WT-2, WT-7, and WT-11; UE-25 WT #3, WT #4, WT #6, WT #12, WT #13, WT #14, WT #15, WT #16, WT #17, and WT #18; UE25 b1-H; and J-13. Figure 3 shows locations for exploratory drill holes from which samples were collected. The sample number in the database (appendix 1) records the drill-hole number first, followed by the depth interval from which the sample was collected. All of the drill hole-samples in appendix 1 are recorded in feet except for USW G-3/GU-3, in which depth is recorded in meters.

The second group, referred to as the Nevada Test Site Outcrop Sample Modes (appendix 2), includes samples collected from measured stratigraphic sections, mapping traverses, and selected outcrop locations in the NTS area. Most of these samples were taken from the Miocene Paintbrush and Timber Mountain Tuffs, ash-flow tuffs and lavas thought to be derived from the Claim Canyon and Timber Mountain caldera centers, respectively (Byers and others, 1976; figure 4).

Appendix 3 contains tables of mode data combined from the following published reports of the U.S. Geological Survey (USGS) and the Los Alamos National Laboratory (LANL): table 1, Quinlivan and Byers (1977); table 2, Byers and Warren (1983); table 3, Byers and Moore (1987); table 4, Warren and others (1984); table 5, Byers (1985); and table 6, Broxton and others (1989). These data were recorded from drill hole and outcrop samples, and details on sample collection and analytical methods are discussed in each report. Data were transcribed from these reports into the author's database format.

STRATIGRAPHY

The volcanic rocks in the NTS area were erupted from caldera complexes that make up a major part of the southwestern Nevada volcanic field (Byers and others, 1976; Carr and others, 1986; and Christiansen and others, 1977) (fig. 4). This relatively thick sequence of Tertiary volcanic rocks (15-7 Ma) consists of ash-flow, ash-fall, bedded, and reworked tuff, lava, and flow breccia, ranging in composition from rhyolite to dacite.

The rock units represented in appendix 1 range in age from approximately 14.0 to 12.5 Ma. The rock units are, from youngest to oldest, the Paintbrush Tuff, tuffaceous beds of Calico Hills, the Crater Flat Tuff, dacite lava and flow breccia, the Lithic Ridge Tuff, and older volcanic rocks penetrated in drill holes USW G-1 and G-2.

The Paintbrush Tuff (about 13.2-12.5 Ma) includes quartz-free to quartz-poor ash-flow tuffs which are thought to be derived from the Claim Canyon cauldron center (Byers and others, 1976) or the Oasis Valley caldera (Christiansen

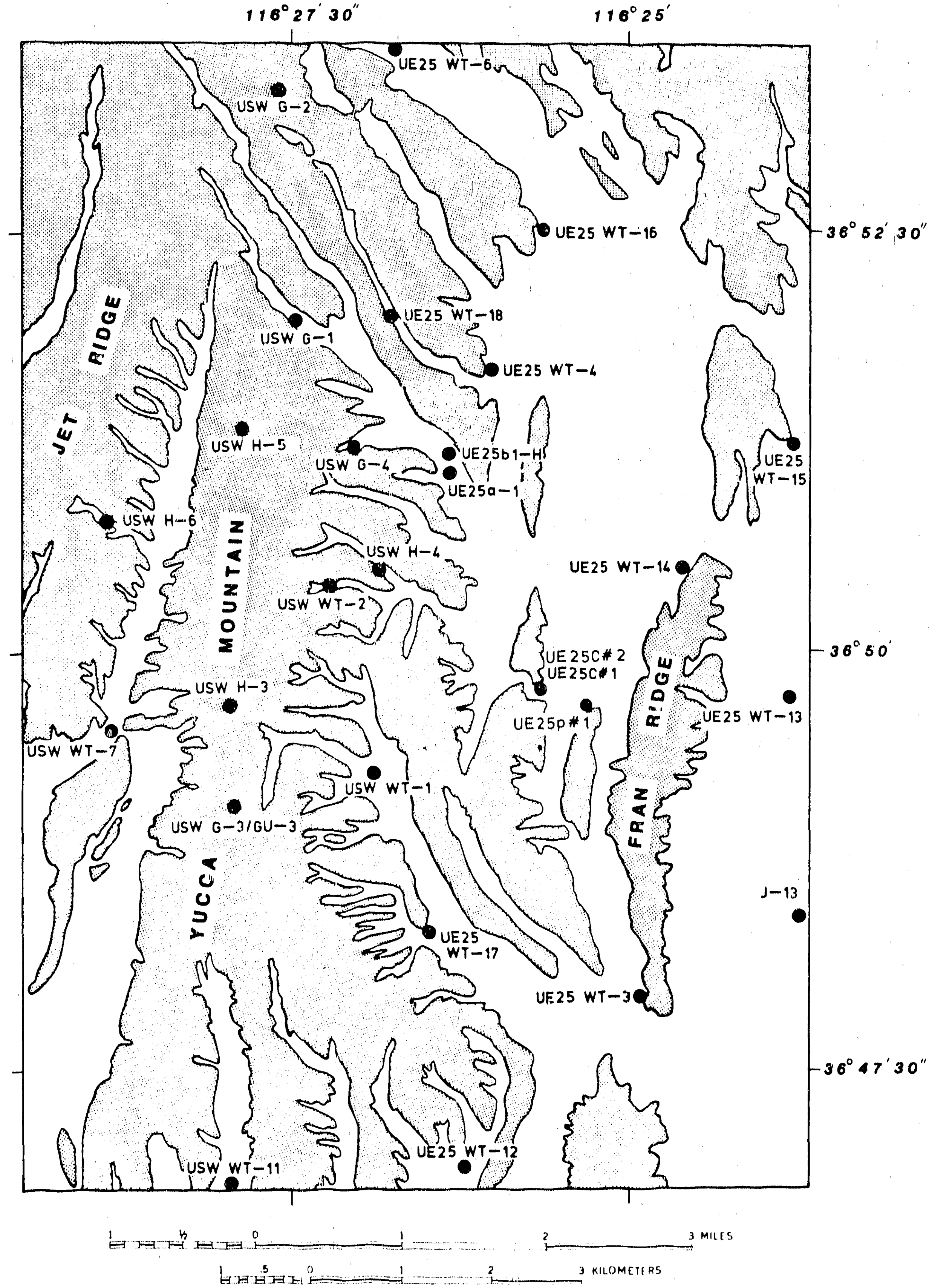

Figure 3. Map showing location of drill holes at Yucca Mountain.

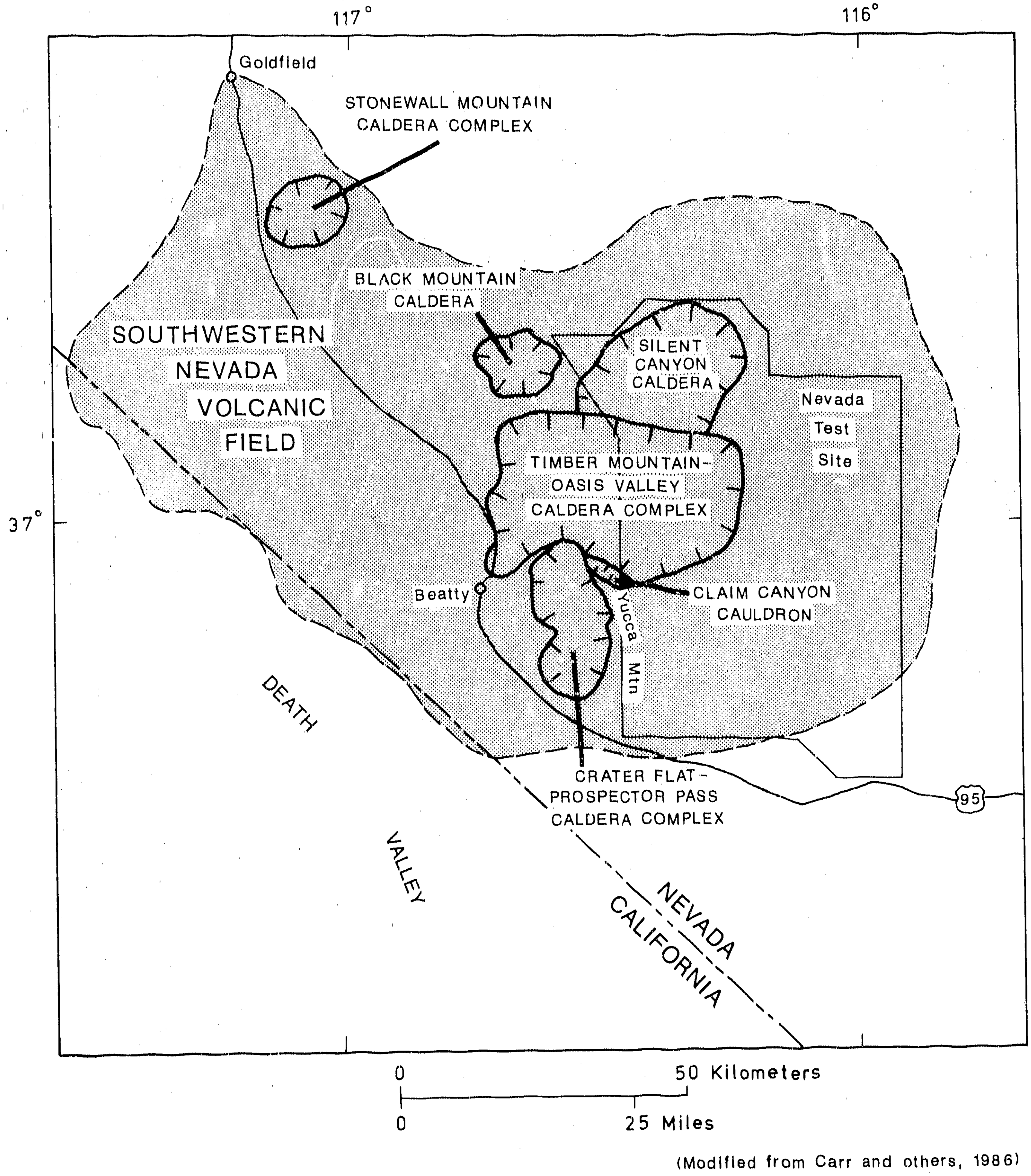

Figure 4. Map showing calderas of the southwestern Nevada volcanic field.

and others, 1977) (fig. 4). Members of the Paintbrush Tuff are, in descending order, the Tiva Canyon, Yucca Mountain, Pah Canyon, and Topopah Spring.

The tuffaceous beds of Calico Hills consist of a series of nonwelded ash-flow tuffs interbedded with thin reworked tuffs and minor rhyolitic lava. Much of this unit is zeolitized throughout the NTS area.

The Crater Flat Tuff is comprised of sequences of rhyolitic ash-flow tuffs characteristically more abundant in quartz and biotite phenocrysts than the overlying units. The members of the Crater Flat Tuff are, in descending order, the Prow Pass, Bullfrog, and Tram. The Crater Flat Tuff is believed to have erupted from the Crater Flat-Prospector Pass caldera complex (Carr and others, 1986) or the Timber Mountain area (fig. 4).

Samples of the dacite lava and flow breccia unit which underlies the Crater Flat Tuff were collected and analyzed from drill holes USW G-1 and G-2. This unit, relatively free of quartz and potassium feldspar phenocrysts, consists primarily of lava; flow breccia generally is near the top and base. Much of the unit is altered to zeolites and other clays.

The Lithic Ridge Tuff, predominantly an ash-flow tuff, is characterized by a low quartz phenocryst content, abundant lithic fragments, and an appreciable amount of sphene. This unit is moderately altered to zeolites and clays.

The older volcanic units that occur below the Lithic Ridge Tuff were penetrated in drill holes USW G-1, and G-2. The unit in USW G-1 consists of ash-flow tuff, interbedded ash-fall, and reworked tuff. The older tuffs of USW G-1 have been subdivided by Spengler and others (1981) into members A (4950-5310 ft.), B (5310-5430 ft.), and C (5340-6000 ft.) (descending order), according to abundances of essential minerals. The older volcanic units of USW G-2 consist of ash-flow tuff, bedded tuff, and lava. They may underlie the older volcanic units of USW G-1. The rocks of the older volcanic units have not been correlated with other units in the NTS area, because of intense alteration, lack of outcrop, and the fact that these units were penetrated in only two drill holes.

Published reports, which discuss the stratigraphy and structure of the rock units found in drill holes USW G-1, -2, -3, and -4, are respectively: Spengler and others (1981), Maldonado and Koether (1983), Scott and Castellanos (1984), and Spengler and others (1984).

The volcanic rock units listed in appendix 2 are the Timber Mountain Tuff (about 11.3 Ma) and the Paintbrush Tuff (13.2-12.5 Ma). The Timber Mountain Tuff (Byers and others, 1976), includes all quartz-bearing ash-flow tuff sheets erupted from the Timber Mountain caldera center. The members of the Timber Mountain Tuff are the younger Ammonia Tanks Member and older Rainier Mesa Member. Informal units within the Timber Mountain Tuff covered by this report include the tuff of Buttonhook Wash, tuff of Cat Canyon, and the tuff of Falcon Canyon. Details of these tuffs were reported by Byers and others (1976).

Two informal units associated with the Paintbrush Tuff, which appear in appendix 2, include the tuff of Chocolate Mountain and the tuff of Pinyon Pass. The tuff of Chocolate Mountain is an intracauldron quartz latite that occurs in the upper part of the Tiva Canyon Member within the cauldron subsidence area. The tuff of Pinyon Pass is an informal unit of the Painbrush Tuff that is restricted to the Claim

Canyon cauldron segment and overlies the tuff of Chocolate Mountain.

The NTS area was extensively mapped from 1960-1968, and the original stratigraphic correlations of the volcanic units were based on similarities in mineralogy of samples recorded on the mode cards. Byers and others (1976) redefined some of the volcanic units as a result of mineralogical comparisons of lavas and tuffs in relation to their volcanic sources. In their study, results of modal analyses of some samples were also interpreted in light of aeromagnetic, and gravity surveys, radiometric-age determinations, geologic mapping, and drill-hole data.

Other stratigraphic studies in the NTS area have been conducted by Carr (1982), Carr and others (1986), Christiansen and others (1977), Diehl and Chornack (in press), Lipman and others (1966), Orkild (1965), and Spengler and others (1987). Current studies are being performed by R.G. Warren of Los Alamos National Laboratory.

DATABASE FORMAT

The database presented in this report was designed by the author to display all pertinent data recorded on the mode cards. Lotus 123, was the computer program chosen because of the database format, ease of data manipulation, associated graphics package, compatibility with other programs, and popularity among PC users.

The identical format was used for input of each of the three computer-based files, except for drill-hole samples in appendix 1, and tables 2, 3, and 5 in appendix 3, which do not have the location column fo samples keyed to plate 1. Each database has 33 columns arranged horizontally. The number of columns is so large, that in order to display all column headings in report form, the database was divided in half, and is presented on facing pages. A brief explanation of the contents of each column of the database is listed below:

Loc: Locality number is only used in appendix 2, and in tables 2, 3, and 5 of appendix 3. Sample locality numbers are shown on plate 1.

1. **Sample number:** Sample number recorded from mode card.

2. **Fm, Mbr:** Stratigraphic formation and member from which the sample was collected. These entries are keyed to codes below.

Formation	Member
Bedded tuff (BT)	
Timber Mountain Tuff (TM)	Buttonhook Wash (BW) Ammonia Tanks (AT) Tuff of Cat Canyon (TCC) Tuff of Falcon Canyon (FC) Rainier Mesa (RM)

Paintbrush Tuff (P)

Tuff of Pinyon Pass (TPP)
Tuff of Chocolate Mountain (TCM)
Tiva Canyon (TC)
Yucca Mountain (YM)
Pah Canyon (PC)
Topopah Spring (TP)

Tuffaceous beds of Calico Hills (CH)

Crater Flat (CF)

Prow Pass (PP)
Bullfrog (BF)
Tram (TR)

Lithic Ridge Tuff (LR)

Dacite lava and flow breccia in USW G-2 (L, LFB, BAT)

Older tuffs of USW G-1

(OG1-A)
(OG1-B)
(OG1-C)

Older tuffs of USW G-2 (OG2)

Codes for informal stratigraphic subunits listed in tables 1, 3, 4, 5, and 6 of appendix 3.

Tables 1 and 6
Upper part (UP)
Lower part (LW)

Tables 3 and 5
Upper vitrophyre (UV)
Caprock (C)
Vapor phase (VP)
Upper lithophysal (UL)
Lava xenolith (LX)
Lithophysal-poor zone (LPZ)
Middle nonlithophysal (MN)
Lower lithophysal (LL)
Lower nonlithophysal (LN)
Altered vitrophyre (AV)
Lower vitrophyre (LV)

Table 4
Upper (U)
Middle (M)
Lower (L)
Upper mafic-poor portion of tuffaceous beds of Calico Hills (1)
Lower mafic-rich portion of tuffaceous beds of Calico Hills (2)

3. **Rock type:** Refers to rock type, degree of welding, and devitrification of the sample. Codes are:

Moderately welded (MW)
Nonwelded (NW)
Welded (W)
Densely welded (DW)
Partially welded (PW)
Devitrified (D)
Ash-fall tuff (AFT)
Ash-flow tuff (AT)
Vitrophyre (V)
Lava and flow breccia (LFB)
Bedded tuff (BT)
Bedded and ash-flow tuff (BAT)
Dacitic (DA)
Upper rhyolitic lava in drill hole USW G-2 (RL1)
Lower rhyolitic lava in drill hole USW G-2 (RL2)
Quartz latite lava in drill hole USW G-2 (QL2)
Breccia (BR)
Lava (L)
Crystallized (C)
Tuff (T)
Nonwelded tuff (NWT)
Partially welded tuff (PWT)
Densely welded tuff (DWT)
Welded tuff (WT)
Flow Breccia (FB)

4. **Age (m.y.):** Absolute geologic age determined by K-Ar age dating methods.

5. **Pts ctd:** Total points counted from thin section.

6. **Lith (percent):** Volume percent lithic fragments observed from total point count.

7. **Lithic type:** Type of lithic fragment observed in thin section. Codes for lithic type are:

Silicic lava (SL)
Lava (L)
Mafic lava (ML)
Altered lava (AL)
Rhyolite lava (RL)
Intermediate lava (IL)
Andesite lava (ANL)
Pilotaxitic lava (PL)

Spherulitic lava (SP)
Basic lava (BL)
Basalt (B)
Volcanic (V)
Devitrified altered volcanic (DAV)
Devitrified silicic volcanic (DSV)
Devitrified rhyolitic volcanic (DRV)
Welded tuff (WT)
Quartz latite tuff (QLT)
Devitrified tuff (DT)
Reworked tuff (RT)
Altered tuff (AT)
Quartzose siltstone (QSI)
Clay matrix (CM)
Sandstone (SS)
Siltstone (SI)
Mudstone (MD)
Eleana Formation (E)
Tuff of Chocolate Mountain (TCM)
Quartz latite in Ammonia Tanks Member of Timber Mountain Tuff (TWB)
Rainier Mesa (TMR)
Tuff of Cat Canyon (TCC)
Argillite (A)
Crystal-rich dacite (CRD)
Granophyric (G)
Myrmekitic (MV)
Porphyritic (PO)
Opaque rimmed devitrified aggregate (OR)
Glass (GL)
Pilotaxitic (PI)
Axiolitic (AX)
Mosaic (MO)
Spheroidal fragments (SD)
Granitic (GR)
Trachytic textured (TH)
Cognate lithic (CL)
Rhyolitic (R)
Dacitic (DA)
Latitic (LA)
Andesitic (AD)
Sedimentary (SE)
Ash-flow tuff (AF)
Intermediate (I)
Basic (BA)
Mafic (M)
Flow banded rhyolite (FBR)

8. **Phen (percent):** Volume percent phenocrysts of total points counted.

9. **Qtz (percent):** Volume percent quartz phenocrysts of total phenocryst count.

10 **AK-F (percent):** Volume percent alkali feldspar phenocrysts of total phenocryst count.

11. **Plag (percent):** Volume percent plagioclase phenocrysts of total phenocryst count.

12. **Plag comp:** Plagioclase composition.

13. **Fels size (mm):** Maximum size (in millimeters) of felsic phenocrysts recorded from point count.

14. **Bi:** Number of biotite phenocrysts recorded from point count.

15. **Hb:** Number of hornblende phenocrysts recorded from point count.

16. **Cx:** Number of clinopyroxene phenocrysts recorded from point count.

17. **Px:** Number of pyroxene phenocrysts recorded from point count.

18. **Ox:** Number of orthopyroxene phenocrysts recorded from point count.

19. **Ac:** Number of acmite phenocrysts recorded from point count.

20. **Other:** Number of mafic phenocrysts not mentioned above recorded from point count.

21. **Maf size (mm):** Maximum size of mafic phenocrysts (in millimeters) recorded from point count.

22. **Mafic (percent):** Volume percent mafic phenocrysts of total phenocryst

count.

23. **Sp:** Number of sphene phenocrysts recorded from point count.

24. **Al:** Number of allanite phenocrysts recorded from point count.

25. **Ap:** Number of apatite phenocrysts recorded from point count.

26. **Zr:** Number of zircon phenocrysts recorded from point count.

27. **Other:** Number of accessory phenocrysts not mentioned above recorded from point count.

28. **Acc (percent):** Percent accessory phenocrysts of total phenocryst count.

29. **Opq:** Number of opaque phenocrysts recorded from point count.

30. **Opaque type:** Type of opaque phenocryst observed in thin section. Code for opaque phenocrysts listed below:
    Hematite (HM)
    Magnetite (MG)

31. **Opaque size (mm):** Maximum size of opaque phenocrysts (in millimeters) recorded from point count.

32. **Opq (percent):** Percent opaque phenocrysts of total phenocryst count

33. **Analyst:** Name and date of thin section analysis (point count). Codes for names recorded on mode cards are listed below.

F.M. Byers	(FMB)
S.F. Diehl	(SFD)
R.B. Scott	(RBS)
N. Clark	(NC)
J.T. O'Connor	(JTO)
W.D. Quinlivan	(WDQ)

"Tr" was recorded in the phenocrysts columns when trace amounts (less than 0.1 percent) of a particular mineral was observed from the point count of the thin section. In many cases, there are no entries in the tables or additional data section, indicating that no data was available from the mode cards.

Many of the mode cards did not have any assigned stratigraphic name or location data. Since these data are a valuable component of the database, an attempt was made by the author to gather this information by interviewing geologists who collected the original samples, and by searching for these data in other publications, field records, and archives. Samples for which the above data could not be found were useless in providing stratigraphic information, and were consequently excluded from the computer files.

As data in appendix 3 contains information from other reports presented in differing, minor modifications of the original data were made during the transfer process. These modifications are discussed below.

First, no sample analyses listed in appendicies 1 and 2 are included in appendix 3; therefore, most of the tables of appendix 3 contain fewer sample analyses than are given in the original reports.

All samples without location data were deleted.

In the Fm,Mbr column in tables 1, 3, 4, 5, and 6, of appendix 3, informal stratigraphic subunits are added to the database to supplement the reported stratigraphic formation and member. Codes for these subunits are defined on page 9.

In table 1 (appendix 3), a leader (--) in the database indicates that no analysis was made or the constituent was absent. In table 2, mafics and opaques are expressed in volume percent of total phenocrysts and accessories are listed in grains per thin section. In table 3, felsics, mafics, accessories, and opaques are recorded in volume percent of total phenocrysts. It should be noted in table 4 that felsic phenocrysts are recorded in relative percent, and an asterisk next to these values indicates that such proportions are based on relative areas of the largest 30+ felsic phenocrysts (Warren and others, 1984). Also in table 4, mafic phenocrysts values were converted from parts per million to volume percent of total phenocrysts. Accessory minerals are listed in number of grains identified for samples from drill hole USW G-1.

Table 5 lists felsics, mafics, and opaques by volume percent, and in table 6, all values for mafics and accessories were converted from parts per million to volume percent.

ACKNOWLEDGMENTS

I would like to thank R.W. Spengler (USGS) and F.M. Byers, Jr., (LANL and formely USGS) for their guidance and suggestions in preparing this report.

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APPENDIX 1A

Yucca Mountain drill hole sample modes
(Explanation of symbols under Database Format, p. 8)

Appendix 1A
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm,Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
61-1561.8	CH	NW,D,AT		3750	2.0	RL,DRV,TWB	2.2	42.7	15.9	40.2		1.5
61-1689.5	CH	NW,AT		8000	1.8	E,DRV,AX,TWB	2	50	23.5	24.1		1.5
61-1811.7	CF,PP	PW,D,AT		3600	0.2	E,DRV	6.4	9.2	50.9	31		1.9
61-1943.4	CF,PP	MW,D,AT		3300	0.5	E,DRV	14.5	12.3	39	47.7		3
61-2009.8	CF,PP	PW,D,AT		3750	2.6	E,DRV,AX,PI	8.2	14.7	45.3	36.8		1.5
61-2124.7	CF,PP	NW,D,AT		3600	0.6	E,DRV	8.9	5.9	49.4	43.2		1.7
61-2231.0	CF,BF	PW,D,AT		3700	0.1	CL,IL-RL	12.7	21.5	34.8	39.9		2.5
61-2246.0	CF,BF	MW,D,AT		3000	0.1	DRV	12.5	17.9	42.9	33.6		2
61-2300.4	CF,BF	PW,D,AT		3750	0.0		14.2	23.5	29.5	43		3.2
61-2354.6	CF,BF	MW,D,AT		3750	0.1	DRV	15.4	25.1	28.8	41.1		2.1
61-2397	CF,BF	PW,D,AT		3750	0.2	DRV	13.7	21.8	29.8	43.1		2.5
61-2461.5	CF,BF	MW,D,AT		3650	0.8	DRV,ML	7.5	5.1	41	46		2.5
61-2470.6	CF,BF	PW,D,AT		3700	1.6	DRV,PL	9.1	16.4	27.2	48.4		1.9
61-2478.3	CF,BF	PW,D,AT		3750	0.5	DRV,PL	10.4	13.3	37.1	45		3
61-2507	CF,BF	MW,D,AT		3700	1.2	DRV,PL	10.6	12	33	45.8		3
61-2555	CF,BF	MW,D,AT		3520	0.8	DRV	10.4	8.2	38.5	48.4		2.1
61-2594.2	CF,BF	PW,D,AT		3750	2.2	DRV,AX,PL	7.7	15.7	29.6	47.7		1.6
61-2678.0	CF,TR	PW,D,AT		3980	1.3	SL,DRV	8.3	13.6	30.2	46.2		2.2
61-2772.6	CF,TR	PW,D,AT		3800	2.1	SL,AX,AF	11.1	27.1	31.2	34.5		2
61-2851.7	CF,TR	MW,D,AT		3900	4.5	SL,AT,AX	14.2	39.5	35	21.1		3
61-2868	CF,TR	DW,D,AT		3360	4.2	DRV,IL,AX	12.9	39.1	32.9	22.7		2.2
61-2931.4	CF,TR	MW,D,AT		4000	3.3	SL,DRV,CL	13.6	35	29.8	29.6		1.8
61-3013.9	CF,TR	PW,D,AT		3500	12.3	AX,IL,G,TWB	13.5	26.1	42.4	27.3		2.5
61-3192.8	CF,TR	PW,AT		3600	23.8	SL,DRV,IL,AX	9.9	31.8	28.2	35.5		1.7
61-3196	CF,TR	PW,D,AT		3460	22.3	IL,DRV,RL,AX	7.7	36.5	27.8	31.6		1.8
61-3284.5	CF,TR	PW,AT		3600	9.0	SL,DRV,AX	9.1	33.1	29.4	31.9		1.9
61-3515.1	CF,TR	PW,AT		3800	25.8	IL,ML,G,AX,AF	8.7	32.6	20.5	41.7		1.6
61-3724.0	FB	DA		3780		IL,PO	12.2			71.9		1.5
61-3908.2	FB	D		3150			12.5		80.5			1.5
61-3969	LR	MW,AT		3300	9.0	DRV,IL,AX,TWB	18.3	2	32.5	61.2		2.3
61-3992	LR	MW,D,AT		3500	26.5	DRV,SL,AX	12.4	3.2	28.3	59.1		2.5
61-4150.4	LR	PW,D,AT		3400	13.8	DRV,IL,AX	8.6	2	33.8	62.1		2
61-4222.1	LR	PW,D,AT		3200	42.7	RL,DT,AX,AF	6.4	6.3	38.5	50.2		1.9
61-4408	LR	PW,AT		1800	11.8	RL,DRV,AX,AF	9.8	1.1	34.7	58		2.5
61-4471	LR	PW,AT		3600	26.4	SL,DRV,AX	5.5	6.6	33.5	52.3		2
61-4578.2	LR	PW,AT		3800	23.8	DRV,IL-ML,AX	7.9	4.6	37.7	53.6		1.7
61-4758.4	LR	PW,D,AT		3900	19.0	DRV,IL,AX,G	9.6	8	36.7	50.9		2.1
61-4849.0	LR	PW,AT		3900	13.0	DRV,IL-ML,AX	9.4	9	33.7	52.6		1.5
61-4917.0	LR	N-PW,D,AT		3800	5.9	DRV,IL,AX,ML	6.1	13.3	32.2	46.4		1.8
61-4946.4	OG1-A	N-PW,D,AT		3450	4.4	AX,DRV	10.2	19.3	20.7	56.2		2.5
61-4969.0	OG1-A	PW,D,AT		3700	3.1	AX,DRV,RL	12.7	23	28.9	42.1		2.4
61-5002.3	OG1-A	N-PW,D,AT		3700	2.5	AX,DRV,RL	17.8	30.2	29.8	35.7		2.4
61-5045.0	OG1-A	MW,D,AT		3700	8.9	AX,DRV,TWB	20.5	26.9	41.7	28.5		2.8
61-5097.9	OG1-A	MW,D,AT		3600	0.6	AX,DRV	17.9	27.4	39.5	30.6		3

Appendix 1A--continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Mafic Phenocrysts Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenoocrysts Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
G1-1561.8	1								1.2											FMB-81
G1-1689.5	3								1.8				tr			1			0.6	FMB-81
G1-1811.7	tr	tr					tr	0.2	3				tr			2			0.9	FMB-80
G1-1943.4	tr						3	0.5	0.6				tr			2			0.4	FMB-80
G1-2009.8	tr	tr					tr	0.5	2.6		tr	tr	tr			2			0.6	FMB-80
G1-2124.7	1						tr		0.3		tr	tr	tr			4			1.2	FMB-81
G1-2231.0	10						5		3.2			tr	tr			3			0.6	FMB-81
G1-2246.0	13	3						0.7	4.3				tr			5			1.3	FMB-80
G1-2300.4	6						tr		2.8			tr	tr			6			1.1	FMB-80
G1-2354.6	13	9							3.9			tr	tr						1.2	FMB-81
G1-2397	20	5							4.9			tr	tr			2			0.4	FMB-81
G1-2461.5	8	6							5.1			tr	tr			2			0.7	FMB-81
G1-2470.6	18	4							6.6			tr	tr			5			1.5	FMB-81
G1-2478.3	15	2							4.3			tr	tr			1			0.3	FMB-81
G1-2507	15							2	6.9			tr	tr			9			2.3	FMB-81
G1-2555	8	8					1		4.7			tr	tr			1			0.3	FMB-81
G1-2594.2	16						1	0.3	5.8		tr	tr	tr			3			1	FMB-80
G1-2678.0	29								8.8	tr	tr	tr	tr			4			1.2	FMB-80
G1-2772.6	22						6	0.3	6.6			tr	tr			2			0.5	FMB-80
G1-2851.7	17								3.1			tr	tr			7			1.3	FMB-80
G1-2868	20								4.6				tr			3			0.7	FMB-80
G1-2931.4	28								5.1				tr			2			0.4	FMB-80
G1-3013.9	17	tr						0.3	3.6		tr		tr			3			0.6	FMB-80
G1-3192.8	15								4.2			tr	tr			1			0.3	FMB-80
G1-3196	11								4.1			tr	tr							FMB-80
G1-3284.5	12	tr						0.6	3.7		tr	tr	tr			6			1.7	FMB-80
G1-3515.1	11						1	0.8	3.6		tr	tr	tr			5			1.5	FMB-80
G1-3724.0		41	6				50	2	21.5			tr				30			6.6	FMB-80
G1-3908.2	tr	25	8				26	1.5	14.9			tr				18			4.6	FMB-80
G1-3969	18						tr		3	tr	tr	tr	tr			8			1.3	FMB-80
G1-3992	34								7.8	tr	tr	tr	tr	tr		7			1.6	FMB-80
G1-4150.4	4								1.4	tr	tr	tr	tr			2			0.7	FMB-80
G1-4222.1	5								2.4	tr		tr	tr			5			2.4	FMB-80
G1-4408	9								5.1	tr	tr	tr	tr			2			1.1	FMB-80
G1-4471	13								6.6	tr	tr	tr	tr			2			1	FMB-80
G1-4578.2	10								3.3	tr	tr	tr	tr			2			0.7	FMB-80
G1-4758.4	10								2.7	tr	tr	tr	tr			6			1.6	FMB-80
G1-4849.0	13								3.6	tr		tr	tr			4			1.1	FMB-81
G1-4917.0	12								5.2	tr	tr	tr	tr			7			3	FMB-80
G1-4946.4	10						2	0.6	3.4	tr	tr		tr			1			0.3	FMB-81
G1-4969.0	18								3.8	tr		tr	tr			10			2.1	FMB-81
G1-5002.3	19								2.9	tr	tr	tr	tr			9			1.4	FMB-81
G1-5045.0	15								2	tr		tr	tr			7			0.9	FMB-81
G1-5097.9	8								1.2	tr	tr	tr	tr			8			1.2	FMB-81

Appendix 1A—continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm, Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
61-5115.5	0G1-A	MW,D,AT		3750	3.1	AX,RL	18.9	23.7	40.3	32.5		2.4
61-5141.5	0G1-A	MW,D,AT		3700	9.2	ML,RL,AX	14.6	26.6	32	38.3		2.1
61-5142.2	0G1-A	PW,D,AT		3750	2.2	DRV,AX,ML,G	19.9	27.4	34.9	34.9		2.3
61-5187.0	0G1-A	MW,D,AT		3780	2.1	AX,ML	18	23.6	36.9	37.2		2.2
61-5265.6	0G1-A	PW,D,AT		3400	5.4	AX,PI,G,DT	17.9	33.8	30.2	33.4		2
61-5316.0	0G1-A	NW,AFT		3600	2.4	PI,SL,IL,AX,DRV	21.8	32.8	36.1	29.2		0.5
61-5322.0	0G1-B	PW,AT		3500	0.9	AX,PI,DRV	15.3	26.7	35	36.3		2.4
61-5358.5	0G1-B	NW,D,AT		3780	1.7	DRV,AX,PI	7.9	19.6	21.6	50.2		1.6
61-5373.7	0G1-B	PW,D,AT		3650	0.7	DRV,AX,PI,CL	12.6	11.8	23.3	55.1		2.5
61-5400.0	0G1-B	PW,AT		3800	2.3	DRV,GR,AX	14.5	11.6	27.8	54.9		2.5
61-5416.6	0G1-B	PW,D,AT		3700	12.8	SP,AX,DRV	11.8	10.5	25.6	58.8		4
61-5438.2	0G1-C	PW,AT		3900	0.7	AX,IL,RL	12.1	1.1	2.8	84.7		2.5
61-5454.1	0G1-C	PW,AFT		3800	1.9	IL,RL,AX,DRV	16.1	14.5	16.9	61.1		2.3
61-5496.1	0G1-C	PW,AT		3900	7.5	DRV,AX,PI,RL	12.7	0.8	3	75.8		2
61-5517.3	0G1-C	PW,AT		3600	10.3	CL,PI,DRV,AX	13.4	1.5	8.3	78.4		1.7
61-5540.0	0G1-C	PW,AT		3700	8.5	PI,DRV,IL,AX,TWB	15.9	0.3		84.4		2
61-5558.7	0G1-C	PW,AT		3600	0.6	AX,PI,DRV	21.4	3.1	3.8	82.5		2.6
61-5600.0	0G1-C	MW,D,AT		3750	8.3	AX,DRV,PI,IL	16.5	4.8	6.8	77.9		2.1
61-5642.0	0G1-C	MW,D,AT		3300	5.8	IL,AX,DRV,PI	18.3	1.3	3.5	79.5		2.8
61-5728.0	0G1-C	MW,D,AT		1650	21.1	IL,AX,DRV,PI	24.2	0	1	88.3		2.6
61-5841.0	0G1-C	MW,D,AT		1650	10.8	PI,AX,IL	20.1	0	3.9	85.5		2.3
61-5894.3	0G1-C	MW,D,AT		1650	7.2	AX,DRV,IL	17	0	3.2	87.6		2.3
61-5929.8	0G1-C	MW,D,AT		1650	5.9	IL,DRV,PI	20.7	3.2	3.5	81.2		2.4
61-5944.9	0G1-C	MW,D,AT		1600	6.3	PI,IL,AX,G	23.6	1.1	5.8	84.9		3.5
61-5980.0	0G1-C	MW,D,AT		1650	3.3	PI,IL,DRV,AX	25	0	0.2	83.5		2.6
61-5984.7	0G1-C	MW,D,AT		1650	2.3	IL,PI,DRV,AX	30.1			84.5		2.8
62-769	P,TP	DW,V,AT		1200	0.2		19		42	49.6	An34?	3.5
62-880	P,TP	DW,D,AT		790	0.1	G	13.2		56.7	37.5		1.5
62-1149	P,TP	DW,D,AT		1450	0.2	DT	0.8	9	45.5	18.2		1
62-1347.5	P,TP	DW,D,AT		1224	0.2	DRV	1.5		11.1	66.7		1.65
62-1517.2	P,TP	DW,D,AT		1580	0.5	L,DT	8.7		38.7	53.3		2
62-1606.5	P,TP	DW,D,AT		1450		CL	0.6	11.1	44.4	22.2		0.9
62-1770	CH	NW,D,AT		5800	1.6	DRV,TWB	1.4	41.2	40	17.5		1.2
62-1863.0	CH	NW,D,AT		1300	10.5	DRV,DT	1.8	44	30	22		1
62-2075.0	CH	NW,AT		1300	3.1	DRV,SP,IL,FBR	6.6	45.4	34.9	18.6		1.5
62-2173	CH	NW,D,AT		1300	3	SP,DRV	6.8	62.5	23.9	9.1		1.2
62-2261	CH	NW,AT		2750	3.4	G,SP,DRV,TWB	5.3	45.2	28.8	20.5		1.4
62-2328	CH	NW,D,AT		1600	6.7	SP,CL,TWB	6.3	39.6	33.7	21.8		1.4
62-2358	CH	NW,D,AT		1100	8.2	WT,TWB	6.5	47.9	12.7	25.4		1.7
62-2499.7	CH	NW,D,AT		1160	5.9	DRV,CL,MD,TWB	11	35.2	20.3	39.8		2
62-2504	CH	NW,D,AT		1450	5.1	DRV,CL,SP,MD,TWB	9.9	30.8	23.8	38.5		2.2
62-2551	CH	NW,D,AT		1450	6.8	CL,DRV,SP,PI,TWB	11.5	31.1	18.6	42.5		2.5
62-2602.8	CH	NW,D,AT		1450	5.4	CL,DRV,TWB	15.9	32.6	18.7	42.2		1.8
62-2650	CH	N-PW,D,AT		1300	3.4	DRV,AX,TWB	21.8	33.9	20.5	38.2		2.5

Appendix 1A--continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenoocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
61-5115.5	18								2.5	tr	tr	tr	tr			7			1	FMB-81
61-5141.5	11								2	tr	tr	tr	tr			6			1.1	FMB-81
61-5142.2	14	tr						0.1	1.9	tr	tr	tr	tr			7			0.9	FMB-81
61-5187.0	6	1							1.2	tr	tr	tr	tr			8			0.2	FMB-81
61-5265.6	8	2							1.6	tr	tr	tr	tr			6			1	FMB-81
61-5316.0	5								0.6	tr	tr	tr	tr			10			1.3	FMB-81
61-5322.0	5								0.9	tr	tr	tr	tr			6			1.1	FMB-81
61-5358.5	18								6.2	tr	tr	tr	tr			7			2.4	FMB-81
61-5373.7	33								7.2	tr	tr	tr	tr			12			2.6	FMB-81
61-5400.0	19								3.5	tr	tr	tr	tr			12			2.2	FMB-81
61-5416.6	10						tr	0.3	2.3	tr	tr	tr	tr			12			2.7	FMB-81
61-5438.2	47								8.2		tr	tr	tr			18			3.2	FMB-81
61-5454.1	27								4.4	tr	tr	tr	tr			19			3.1	FMB-81
61-5496.1	82								16.6	tr	tr	tr	tr			19			3.8	FMB-81
61-5517.3	41								8.5	tr	tr	tr	tr			16			3.3	FMB-81
61-5540.0	71						3	1.4	13.2	tr	tr	tr	tr			16			2.7	FMB-81
61-5558.7	59	4							8.2	tr	tr	tr	tr			19			2.5	FMB-81
61-5600.0	38	3						1	6.6	tr	tr	tr	tr			24			3.9	FMB-81
61-5642.0	71						5		12.6	tr	tr	tr	tr	tr		19			3.1	FMB-81
61-5728.0	30						tr	0.7	7.5	tr	tr	tr	tr			13			3.2	FMB-81
61-5841.0	20						1		6.3	tr	tr	tr	tr	tr		14			4.2	FMB-81
61-5894.3	10	10							7.2	tr	tr	tr	tr			6			2.1	FMB-81
61-5929.8	22	9						1.8	9	tr	tr	tr	tr			10			2.9	FMB-81
61-5944.9	11	12	tr						6.1	tr	tr	tr	tr			8			2.1	FMB-81
61-5980.0	40						15	0.7	13.3	tr	tr	tr	tr			12			2.9	FMB-81
61-5984.7	45	14	2						12.3	tr	tr	tr	tr			16			3.2	FMB-81
62-769	12		4					1.25	7.1			tr	tr			3		0.6	1.2	SFD-81
62-880	4			1				0.8	4.9			tr	tr			1		0.5	1	SFD-82
62-1149	1						tr	0.35	9			tr	tr			2		0.8	18.2	SFD-82
62-1347.5	1							0.4	5.6			tr	tr			3		0.45	16.7	SFD-84
62-1517.2	8			1				1	6.5	tr	tr	tr	tr			3		0.4	2.2	SFD-84
62-1606.5	1						tr	0.85	11.1				tr			1		0.35	11.1	SFD-84
62-1770	1								1.2											FMB-81
62-1863.0	1							0.2	4							tr				RBS-81
62-2075.0	tr															1			1.2	RBS-81
62-2173	3								3.4							1			1.1	RBS-81
62-2261	7								4.8			tr	tr			1			0.7	FMB-81
62-2328	2								2			tr	tr			3			3	FMB-81
62-2358	9						tr		12.7				tr			1			1.4	FMB-81
62-2499.7	5								3.9				tr			1			0.8	FMB-81
62-2504	9								6.3			tr	tr			1			0.7	FMB-81
62-2551	11						tr		6.6			tr	tr			2			1.2	FMB-81
62-2602.8	15								6.5			tr	tr							FMB-81
62-2650	14						4	2.2	6.3			tr	tr			3			1.1	FMB-81

Appendix 1A—continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm, Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts: Qtz (%)	Felsic Phenocrysts: AK-F (%)	Felsic Phenocrysts: Plag (%)	Felsic Phenocrysts: Plag comp	Fels size (mm)
62-2708	CF,PP	DW,D,AT		1450	0.3		10.1	13	52.1	31.5		2
62-2755.0	CF,PP	PW,D,AT		1500	0.5	WT,IL,E	13.7	15	39.3	41.7		3
62-2928.7	CF,PP	MW,D,AT		1500	0.9	V	18.8	16.3	42.2	34		2.5
62-3042	CF,PP	PW,D,AT		1650	7.3	MD,DRV,AX,G	13.1	15.7	47.7	36.1		1.8
62-3064	CF,PP	MW,D,AT		1650	2.3	MD,DRV,AX,PI	14.1	7.3	42.9	45.5		2
62-3108.1	CF,PP	MW,AT		1500	1.8	MD,ML,AX	12.7	4.2	33.2	57.9		2.9
62-3122.2	CF,PP	MW,D,AT		1500	0.7	MD	11.3	8.8	53.5	36.5		2.1
62-3143.5	CF,PP	PW,D,AT		1470	2.4	DRV,MD,AX	11.3	10.8	48.8	39.2		2.3
62-3159.4	CF,PP	NW,D,AT		1500	2.6	MD,AL,DRV,PI,AX	9.5	7	43	48.6		1.6
62-3216.7	CF,PP	PW,D,AT		1500		MD,DRV,AX	6.7	14	30	55		1.5
62-3244.3	CF,PP	N-PW,D,AT		1500	2.4	MD,AX,IL,PI,TWB	6	17	38	43		2.3
62-3271	BT	BT		1200	5.2	SP	17	7.5	35	52		2
62-3285	CF,BF	MW,D,AT		1300	0.8	SP	17.4	4	25.7	58		1.5
62-3292.5	CF,BF	NW,D,AT		1300	0.4	DRV,MD	16.5	20.1	29.4	46.3		2.5
62-3294.0	CF,BF	NW,D,AT		1500			10.5	23.6	32.5	38.9		2
62-3313.0	CF,BF	MW,D,AT		1365	0.4	L,DRV	12.4	17.8	32.6	44.4		2.2
62-3326.0	CF,BF	MW,D,AT		1430	0.3	DRV	15.2	17.9	40.8	38.5		1.8
62-3350.9	CF,BF	MW,D,AT		1500	13.3	V	8	20	43.3	31.7		1.4
62-3362.1	CF,BF	PW,D,AT		1500	0.7	DRV,RL,AX,MD,TWB	10.4	14.7	44.2	38.5		2.2
62-3433.9	CF,BF	PW,D,AT		1500			10.7	6.9	40.6	48.7		2.8
62-3475	CF,BF	PW,D,AT		1500	1.8	PI	10.5	14	43.3	35		2.5
62-3583.0	CF,TR	PW,C,AT		1500	19.7	DT,PI	10.2	26.1	22.9	45.8		2.5
62-3601	CF,TR	PW,D,AT		3300	85.6	IL,QLT	3	23	27	45		2
62-3626	CF,TR	NW,D,AT		3500	79.2	ML,QLT,AX,PI	5.1	33.9	29.4	31.1		1.6
62-3730.5	CF,TR	PW,AT		3500	35.9	ML,QLT,IL,AX,SP	4.9	32.9	27.2	34.7		1.5
62-3787.3	CF,TR	PW,AT		1300	53		5.4	34	23	23		1.2
62-3834	CF,TR	PW,AT		2950	12.4	DRV,ML,AX,IL	4.3	35.1	22.6	38.1		2
62-3872.6	CF,TR	PW,AT		1300	13	SP	7.2	34	21.3	35.1		2.5
62-3907.0	CF,TR	PW,AT		1300	11		12.2	35	30	21		1.5
62-4078	BT	BT		1150	12.3	SP	31.4	6.7	9.1	77		1.5
62-4134.2	LFB	L,RL1		1300		SP	37			63		
62-4170.5	BT	BT		1100	9.2	SP,M	25.8	0.7		62		2
62-4185.4	BT	BT		1300	9.8	SP	32.5	0.7	1	78.4		2
62-4200.2	LR	PW,D,AT		1300	4.7	SP	27	0.3	2	86		1.5
62-4239.4	LR	PW,AT		1300	23.5	SP	18.3	1.7	24	66		2
62-4348.8	LR	MW,AT		1300	10	SP	14.1	10	25	57		2
62-4445.9	LR	MW,AT		1300	18	SP	9.7	10.3	30.2	51.6		2.5
62-4568.0	LR	MW,AT		1300	57	SP,IL	7.4	10	23	51		2
62-4667.5	LR	MW,D,AT		1364	18.2	PI	8	8.3	28.4	60.6		2.4
62-4770.3	LR	MW,AT		1400	11.7		9.8	10.9	35.8	43.8		1.9
62-4838	BAT	NW,AFT		1850	1.5	SP,IL	16.3	0.7	2.7	87.4		
62-4841.2	BAT	PW,D,AT		1284	2.4	DT	15.3	1	5.1	84.3		3.5
62-5002.4	L	L,D,RL2		1100	0.3		8.9	0	0	83.7		
62-5109.7	L	L,D,RL2		1300	0.2		8.4	0	4.6	75.2		3

Appendix 1A—continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenoocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
62-2708	2			tr			3	1.5	3.5				tr			0				FMB-81
62-2755.0	1	5		tr				1.1	2.9			tr	tr			2			1	FMB-81
62-2928.7	1			5				1.3	2.2			tr	tr			1		0.5	0.4	SFD-82
62-3042	tr						tr						tr			1			0.5	FMB-81
62-3064	tr	1					5	1	2.5		tr	tr	tr			4			1.7	FMB-81
62-3108.1		1		6				1	3.7		tr	tr	tr			2			1.1	FMB-81
62-3122.2	tr												tr			2			1.2	FMB-81
62-3143.5	1								0.6		tr	tr	tr			1			0.6	FMB-81
62-3159.4									1.4	tr	tr	tr	tr			2				FMB-81
62-3216.7	1								1		tr		tr							FMB-81
62-3244.3	1						1	0.4	1	tr	tr		tr						1	FMB-81
62-3271	7							1	4		tr					3			1.5	RBS-81
62-3285	18	1						1	8.4			tr				9			4	RBS-81
62-3292.5	8								3.7		tr	tr	tr			1			0.5	FMB-81
62-3294.0	7								4.5			tr	tr			1			0.6	FMB-81
62-3313.0	8						tr	0.6	4.7			tr	tr			1			0.6	FMB-81
62-3326.0	4						tr	0.6	2.7			tr	tr							FMB-81
62-3350.9	2						1	0.8	2.5			tr	tr			3		0.5	2.5	SFD-82
62-3362.1	3						tr		1.9			tr	tr			1			0.7	FMB-81
62-3433.9	4						tr	0.5	2.5			tr	tr			2			1.3	FMB-81
62-3475	10	tr						1	6.4			tr	tr			2		0.3	1.3	SFD-82
62-3583.0	6	1						1	4.6			tr	tr			1		0.2	0.7	SFD-82
62-3601	4								4				tr			1			1	FMB-81
62-3626	7						tr	0.5	3.9		tr		tr			3			1.7	FMB-81
62-3730.5	5						1		3.5				tr			3			1.7	FMB-81
62-3787.3	5	2							10							7			10	RBS-81
62-3834	3						1		2.4				tr			3			1.8	FMB-81
62-3872.6	2							0.5	2.1							7			7.4	RBS-81
62-3907.0	3	5						0.3	5.1				tr			15			9.5	RBS-81
62-4078	16							0.5	4.4			tr	tr			10			2.8	RBS-81
62-4134.2	19	140							32.9			tr	tr			21			4.3	RBS-81
62-4170.5	9	71						1.5	28.2							26			9.2	RBS-81
62-4185.4	36	16						2	12.3			1	tr		0.2	31		0.3	7.4	RBS-81
62-4200.2	14	1						1.2	4.6			1	tr		0.3	24			3.6	RBS-81
62-4239.4	12							2	5	tr			tr			8			3.4	RBS-81
62-4348.8	5							0.5	2.7	tr		tr	tr			9			4.9	RBS-81
62-4445.9	4							0.5	3.2	tr		tr	tr			6			4.8	RBS-81
62-4568.0	6	3							9	tr		tr	tr			6			6	RBS-81
62-4667.5	2							0.5	1.8			tr	tr			1		0.8	0.9	SFD-82
62-4770.3	6						5	0.5	8			tr	tr			2		0.3	1.5	SFD-82
62-4838	tr								6.3				tr			tr			3	SFD-82
62-4841.2	18						1	0.5	9.6			tr	tr				MG			SFD-82
62-5002.4	12								12.2			tr	tr			4			4.1	RBS-81
62-5109.7	14	4						1	16.5			tr	tr			4			3.7	RBS-81

Appendix 1A—continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm, Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts: Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
62-5195	L	L,D,RL2		1450			9.7		9.9	65.9		1.8
62-5210.5	L	L,D,QL2		1600			27.9			78.3		6.5
62-5230.0	L	L,D,QL2		1480			26.4		2.5	76.2		2.5
62-5318.8	L	L,D,QL2		1400			25.7		1.1	71.1		2.5
62-5403.0	L	L,D,QL2		1300			32.1		1.9	74.8		3
62-5490.0	L	L,D,QL2		1500			31.7	0.2	1.3	71		2.5
62-5591.2	LFB	L,D,QL2		1262			22		1.1	76.9		5.5
62-5661.0	BAT	PW,D,AT		1300	14.3		28.5	0.8	1.4	79.7		1.8
62-5663.4	BAT	MW,D,AT		1372	12.7	PI,WT	25.1	2	2.6	81.7		3
62-5670.2	BAT	PW,D,AT		1200	2.8	LA,DT	26.3			78.2		3
62-5690.6	LFB	D,DA		1400			45.7			73.6		2.5
62-5783.0	LFB	D,L,DA		1400			46.4			82.2		3.6
62-5923.2	BAT	N-PW,D,AT		1600	1.4	DT	6.9	3.6	50	41.8		1.3
62-5945.8	062	MW,D,AT		1500	4.9	SP	18.7	6.8	48.2	42.9		3.2
62-5986.9	062	MW,D,AT		1300	4	AX,DRV,PI	22.4	6.9	38.1	50.9		2.5
62-6005.6	062	MW,D,AT		1150	5.7	AX,AL,IL,DRV	16.3	7.5	41.7	46		2.2
GU3-11.66	P,TC	MW,D,AT		1480	0.7		16.1	1.3	63.9	28.2		
GU3-13.90	P,TC	M-DW,D,AT		1680	0.4		6.2		88.6	6.7		
GU3-23.89	P,TC	M-DW,D,AT		1580			2.5		100			
GU3-74.90	P,TC	M-DW,D,AT		1580	0.2		3.4		92.6	3.7		
GU3-92.56	P,TC	M-DW,D,AT		1680	1.1		3.3		94.6			
GU3-104.04	P,TC	M-DW,D,AT		682	4.6		17.5		98.4	0.8		
GU3-108.59	P,TC	P-MW,D,AT		1580	0.3	CL	4		100			
GU3-129.33	P,TP	PW,AT		1680	3.3		5.9	1	55.6	38.4		
GU3-131.27	P,TP	MW,D,AT		1580	0.4		17	0.4	47.2	42.8		
GU3-141.58	P,TP	MW,D,AT		1580	0.1		13.7		64.8	24.1		
GU3-160.23	P,TP	MW,D,AT		1580			4.9		70.1	23.4		
GU3-193.03	P,TP	MW,D,AT		1680	0.2	GR	1.2		30	65		
GU3-234.42	P,TP	MW,D,AT		1580	0.4		0.3		20	60		
GU3-291.04	P,TP	MW,D,AT		1480	0.7	DSV	1.4		4.8	90.4		
GU3-344.52	P,TP	MW,D,AT		1580	3.7		1.1	11	28	61		
GU3-373.94	P,TP	DW,V,AT		1630	2.3	V	1.5	8.3	37.5	41.7		
GU3-397.00	P,TP	PW,AT		1480	8		1.6	8	33	42		
GU3-419.6	P,TP	NW,AT		22				25	35	35		
GU3-430.69	CH	NW,AT		1480	2.4	GL?	3.2	14.6	29.2	47.9		
GU3-438.75	CH	NW,AT		1580	2.5	GL	2.1	23.5	38.2	35.3		
GU3-456.68	CH	NW,AT		1480	16	GL	1.8	7.4	63	29.6		
GU3-479.02	CF,PP	NW,AT		1530	1	MD,VL	7.4	13.3	45.1	38.9		
GU3-487.33	CF,PP	NW,AT		1380	0.9	MD	9.2	16.5	29.9	48		
GU3-488.62	CF,PP	PW,D,AT		1680	1.4	DSV,MD	8.3	6.5	38.1	53.2		
GU3-531.54	CF,PP	PW,D,AT		1280	2.2	MD,GR	10.7	2.333	29.9	52.6		
GU3-571.12	CF,PP	PW,D,AT		1480	3.4	MD,DSV,L,IL,SP	9.3	7.2	35.5	53.6		
GU3-605.40	CF,PP	PW,D,AT		1480	2.3	MD,DSV	8.8	7.7	46.1	42.3		
GU3-615.33	CF,BF	PW,AT		1580	0.1		8.8	19.4	29.8	46		

Appendix 1A—continued

YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenoocrysts				
G2-5195	18	7						1	17.8			tr	tr			9	MG	0.3	6.4	SFD-82
G2-5210.5	43	46					tr	1.3	19.9			tr	tr			8		0.4	1.8	SFD-82
G2-5230.0	43	37						1.2	20.5			2	tr	tr	0.5	1		0.25	0.3	SFD-82
G2-5318.8	38	61		tr				0.7	27.5			tr	tr			1	MG, HM	0.25	0.3	SFD-82
G2-5403.0	65						29	1.8	22.6			tr	tr			3		0.28	0.7	SFD-82
G2-5490.0	93						38	1.3	27.5			tr	tr							SFD-82
G2-5591.2	39						14	2	19.1			tr	tr			8	MG	0.5	2.9	SFD-82
G2-5661.0	52	3						0.8	14.9			tr	tr			12		0.4	3.2	SFD-82
G2-5663.4	28							0.7	8.2			tr	tr			19		0.4	5.5	SFD-82
G2-5670.2	50	12						1	19.6			tr	tr			7		0.3	2.2	SFD-82
G2-5690.6			145					0.4	22.7			tr				24	MG	0.4	3.8	SFD-82
G2-5783.0			116					0.7	17.8			tr	tr			tr	MG			SFD-82
G2-5923.2	3							0.5	2.7	2		tr			1.8		MG			SFD-82
G2-5945.8	2						tr		0.7	tr		tr	tr			4			1.4	FMB-81
G2-5986.9	4						2		2.1	tr		tr	tr			6			2.1	FMB-81
G2-6005.6	4	tr					1		2.6			tr	tr	tr		4			2.1	FMB-81
GU3-11.66	11	tr	1		1				5.4	tr	tr	tr	tr			3			1.3	RBS-82
GU3-13.90	3	1	tr		tr				3.9	tr		tr	tr						1	RBS-82
GU3-23.89	tr	tr								tr			tr			tr				RBS-82
GU3-74.90	tr	2							3.7	tr			tr			tr				RBS-82
GU3-92.56		2			1				5.4	tr		tr	tr			tr				RBS-82
GU3-104.04	tr	tr											tr			1			0.8	RBS-82
GU3-108.59		tr								tr		tr	tr			tr				RBS-82
GU3-129.33	4	tr	tr						4			tr	tr			1			1	RBS-82
GU3-131.27	12		6						6.7			tr	tr			8			3	RBS-82
GU3-141.58	9		4						6			tr	tr			11			5.1	RBS-82
GU3-160.23	2		tr						2.6			tr	tr			3			3.9	RBS-82
GU3-193.03	1								5			tr	tr			tr				RBS-82
GU3-234.42	tr											tr	tr			1			20	RBS-82
GU3-291.04	1								4.8			tr	tr			tr				RBS-82
GU3-344.52	tr											tr	tr			tr				RBS-82
GU3-373.94	1								4.2			tr	tr			2			8.3	RBS-82
GU3-397.00	3								12				tr			1			4	RBS-82
GU3-419.6	tr	tr														tr				RBS-82
GU3-430.69	2	2	tr		tr				8.4			tr	tr			tr				RBS-82
GU3-438.75	1	tr							2.9			tr	tr	tr		tr				RBS-82
GU3-456.68	tr												tr			tr				RBS-82
GU3-479.02	tr	tr			3				2.6		tr	tr	tr			tr				RBS-82
GU3-487.33	1	tr			2				2.4		tr	tr	tr			4			3.2	RBS-82
GU3-488.62	2				1				2.1		tr	tr	tr			tr				RBS-82
GU3-531.54	2				tr				1.5		tr	tr	tr			2			1.5	RBS-82
GU3-571.12	1	tr			1				1.4	tr	tr	tr	tr			3			2.2	RBS-82
GU3-605.40	tr	tr			2				1.5		tr	tr	tr			3			2.3	RBS-82
GU3-615.33	4	tr							2.9		tr	tr	tr			4			2.9	RBS-82

Appendix 1A--continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm,Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Felsic Phenocrysts Phen (%)	Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
GU3-631.04	CF,BF	PW,D,AT		1530			11.6	15.7	35.4	42.7		
GU3-651.78	CF,BF	MW,D,AT		1630	0.1		17.6	20.6	34.5	39		
GU3-664.85	CF,BF	MW,D,AT		1380	2.1	SL	17.5	17	33.2	44.8		
GU3-722.22	CF,BF	M-DW,D,AT		1580	0.1		19.3	18.7	34.8	41.3		
GU3-752.00	CF,BF	DW,D,AT		1655	0.5		21.9	19	32	43.2		
GU3-785.61	CF,BF	MW,D,AT		1480	2.6	SP	9	9.7	32.8	49.2		
G3-800.77	CF,TR	N-PW,D,AT		1630	1.2	SL,SP,TH	9.4	17.5	14.9	58.4		
G3-809.75	CF,TR	N-PW,D,AT		1580	1.8	DSV,TH	11.3	24.2	29.2	41		
G3-822.60	CF,TR	N-PW,D,AT		1630	3.5		12.6	28.3	23.9	44.9		
G3-829.94	CF,TR	N-PW,D,AT		1630	2.1		11.8	32.8	30.2	30.2		
G3-853.88	CF,TR	N-PW,D,AT		1580	0.7		12.3	30.9	32.5	30.9		
G3-873.82	CF,TR	N-PW,D,AT		1630	1.5	TH	10.1	31.1	30.5	31.1		
G3-888.33	CF,TR	P-MW,D,AT		1680	3.4	SP,IL,SL	15.5	34.6	31.2	26.9		
G3-928.22	CF,TR	MW,D,AT		1680	1.33	SP,IL	13.2	27.9	29.3	34.7		
G3-936.38	CF,TR	P-MW,D,AT		1680	2.4	IL,TH	15.2	30.5	32	31.6		
G3-948.90	CF,TR	P-MW,D,AT		1655	14.3	IL	15	36.3	25.8	34.3		
G3-964.47	CF,TR	MW,D,AT		1580	20.4	MD	13.8	27.5	30.3	37.2		
G3-983.28	CF,TR	M-DW,V,AT		1680	17.5	FBR,IL	13.2	32.1	33	25.3		
G3-1019.14	CF,TR	P-MW,D,AT		1680	18.6	IL	11.2	43.6	23.4	20.7		
G3-1049.00	CF,TR	P-MW,D,AT		1680	28.3	SP	11	35.7	22.7	35.7		
G3-1059.30	CF,TR	P-MW,D,AT		1530	25		8.6	21.4	22.1	43.5		
G3-1122.49	CF,TR	P-MW,D,AT		1630	34	SP,IL	9.2	44.7	14	32		
G3-1137	CF,TR	P-MW,D,AT		1580	31	IL	8	31.8	22.2	38.1		
G3-1145.74	CF,TR	P-MW,D,AT		1680	28	IL	9	24	24	42		
G3-1183.57	LR	MW,D,AT		1580	2.5		22	1.5	13	67		
G3-1221.76	LR	PW,D,AT		1600	16	TH	11.5	2.2	22.3	64.7		
G3-1231.08	LR	N-PW,D,AT		1580	17.5	SP	8.5	6.7	30.4	53.3		
G3-1264.81	LR	N-PW,D,AT		1630	15.8	SP,TH	8	10.7	30.5	49.6		
G3-1292.50	LR	P-MW,D,AT		1200	25	SP	8	10.4	32.3	52.1		
G3-1307.10	LR	PW,D,AT		1430	28.4	SP	10.6	4.6	46.7	44.1		
G3-1337.50	LR	MW,D,AT		1580	20.6	SP	9.8	5.8	[illegible]	49.7		
G3-1348.13	LR	MW,D,AT		1630	16.9	DSV,SP	9.6	2.7	45.2	45.2		
G3-1352.76	LR	P-MW,D,AT		1630	30.5	SP	6.6	5.6	33.6	50.5		
G3-1392.47	LR	P-MW,D,AT		1530	20.5	SP	11.2	3.5	35.5	58.1		
G3-1429.18	LR	P-MW,D,AT		1600	19.8	SP	8.8	9.9	38.3	48.9		
G3-1435.22	LR	MW,D,AT		1450	21.9	SP	9.9	7.6	35.4	52.1		
G3-1449.84	LR	MW,D,AT		1630	22.9	SP,GR	11.7	6.3	27.2	59.2		
G3-1474.99	LR	MW,D,AT		1655	15	SP,GR	10	9.6	77.1	56.6		
G3-1495.44	OG1-A	MW,D,AT		1630	2.3	SP	18.3	28.7	35.2	33.6		
G3-1528.36	OG1-A	M-DW,D,AT		1650	1.8	SP	16.2	27.6	33.2	32.8		
G4-107	P,TC	MW,AT		1400	0.2	DT,L	4.9		92.6	2.9		2.1
G4-121.5	P,TC	PW,AT		1350	0.2		1.9		80.8	3.8		1.5
G4-148.4	P,YM	NW,AT		1512		SP						0.5
G4-178.4	P,PC	NW,AT		1492	0.9		6.9	1	51.5	33		2.1

Appendix 1A--continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenoocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
GU3-631.04	7	1							4.5			tr	tr			3			1.6	RBS-82
GU3-651.78	10	4							4.9	tr	tr	tr	tr			3			1	RBS-82
GU3-664.85	7	1							3.3		tr	tr	tr			4			1.7	RBS-82
GU3-722.22	9	1							3.2	tr	tr	tr	tr			5			1.6	RBS-82
GU3-752.00	10	6							4.4		tr	tr	tr			5			1.4	RBS-82
GU3-785.61	6	2							6	tr	tr	tr	tr			3			2.2	RBS-82
G3-800.77	12	1							8.4	tr	tr	tr	tr			1			0.6	RBS-82
G3-809.75	10								5.6	tr	tr	tr	tr			tr				RBS-82
G3-822.60	5								2.4	tr		tr	tr			1			0.5	RBS-82
G3-829.94	10								5.2			tr	tr			3			1.6	RBS-82
G3-853.88	11	tr							5.7	tr		tr	tr			tr				RBS-82
G3-873.82	10	2							6.1	tr	tr	tr	tr			2			1.2	RBS-82
G3-888.33	16	tr							6.2	tr	tr	tr	tr			3			1.2	RBS-82
G3-928.22	13								5.9			tr	tr			5			2.2	RBS-82
G3-936.38	10	tr							3.9	tr		tr	tr			5			2	RBS-82
G3-948.90	7	1							3.2			tr	tr			1			0.4	RBS-82
G3-964.47	5	tr							2.3			tr	tr			6			2.8	RBS-82
G3-983.28	12	1							5.8			tr	tr			6			2.7	RBS-82
G3-1019.14	7								3.7			tr	tr			6			3.2	RBS-82
G3-1049.00	4								2.2	tr		tr	tr			6			3.2	RBS-82
G3-1059.30	6	tr							4.6	tr		tr	tr			11			8.4	RBS-82
G3-1122.49	9								6			tr	tr			5			3.3	RBS-82
G3-1137	6								4.8			tr	tr			3			2.4	RBS-82
G3-1145.74	7	1							5.3	tr		tr	tr			6			4	RBS-82
G3-1183.57	44	6	3						15.6	tr	tr	tr	tr			10			2.9	RBS-82
G3-1221.76	13	1							7.6	tr	tr	tr	tr			6			3.3	RBS-82
G3-1231.08	5	2							5.2	tr	tr	tr	tr			6			4.4	RBS-82
G3-1264.81	5								3.8	1	tr	tr	tr			6			4.6	RBS-82
G3-1292.50	3								3.1	tr		tr	tr			2			2.1	RBS-82
G3-1307.10	2								1.3	tr	tr	tr	tr			5			3.3	RBS-82
G3-1337.50	7								4.5	tr	tr	tr	tr			5			3.2	RBS-82
G3-1348.13	6								4.1	tr	1	tr	tr			3			1.8	RBS-82
G3-1352.76	6								5.6	1	1	tr	tr			3			2.8	RBS-82
G3-1392.47	3								1.7		tr	tr	tr			2			1.2	RBS-82
G3-1429.18	2								1.4		tr	tr	tr			2			1.4	RBS-82
G3-1435.22	6								4.2			tr	tr			1			0.7	RBS-82
G3-1449.84	5								2.6		tr	tr	tr			9			4.7	RBS-82
G3-1474.99	5								3	1	tr	tr	tr			5			3	RBS-82
G3-1495.44	5								1.6		tr	tr	tr			3			1	RBS-82
G3-1528.36	12								4.5		tr	tr	tr			5			1.9	RBS-82
G4-107		1						0.5	1.5	1	tr	tr	tr		1.5	1		0.3	1.5	SFD-83
G4-121.5		1						0.65	3.8	2	tr	tr	tr		7.8	1		0.3	3.8	SFD-83
G4-148.4	tr			tr				0.8		tr			tr			tr				SFD-82
G4-178.4	9		1					0.9	9.7	tr	tr	tr	tr			5		0.3	4.8	SFD-82

Appendix 1A--continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm, Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts: Qtz (%)	Felsic Phenocrysts: AK-F (%)	Felsic Phenocrysts: Plag (%)	Felsic Phenocrysts: Plag comp	Felsic Phenocrysts: Fels size (mm)
G4-220	P,PC	NW,AFT		1550	0.9		7.2		34.8	45.5		1.5
G4-231	P,TP	NW,AT		1550	2.5		3.4		29.4	43.1		2
G4-236.5	P,TP	N-PW,AFT		1460	1.5	DT	1.7	4	40	52		1.7
G4-240.2	P,TP	DW,V,AT		1490	0.7	L,DT	15.4		46.5	43.9		1.8
G4-243.6	P,TP	DW,D,AT		1487	0.7	DT	14.2		62.6	29.4		1.9
G4-253	P,TP	DW,D,AT		1540	0.3		12.9		48	38.9		2.5
G4-272.6A	P,TP	MW,AT		1450			7	1	78.2	13.9		2.5
G4-272.6B	P,TP	MW,AT		2457	0.04		7.4	0.6	71	20.2		
G4-280.8	P,TP	DW,AT		1450	0.1		14.1		61.3	29.4		1.8
G4-307.6	P,TP	DW,D,AT		1500	0.3	DT	18.4		52.9	36.2		2
G4-383.3	P,TP	DW,D,AT		1492	0.1	DT	11.3		70.8	23.8		2.1
G4-416.2	P,TP	DW,D,AT		1260			10.6	0.7	67.2	26.9		2.3
G4-446.7	P,TP	DW,D,AT		1370	0.1		2		59.3	37		1.8
G4-500.9	P,TP	DW,D,AT		1472			1	7.1	14.3	64.3		1.25
G4-625.7	P,TP	DW,D,AT		1405			0.9		41.7	50		1.3
G4-694.8	P,TP	DW,D,AT		1410	0.2	R	1		16.7	66.7		1.4
G4-746.6	P,TP	DW,D,AT		1450	0.3		0.7		30	60		1.55
G4-817.3	P,TP	DW,D,AT		1330			1		30.8	61.5		1
G4-934.2	P,TP	DW,D,AT		1238	3.1	DT	0.9	9.1	72.7	18.2		1.15
G4-934.2	P,TP	DW,D,AT		2880	1.2		1.3	10.5	37.2	47.4		
G4-1026.0	P,TP	DW,D,AT		1330	0.1	DT	0.8		30	50		1
G4-1089.0	P,TP	DW.D.AT		1330			0.8		18.2	36.4		0.75
G4-1117.8	P,TP	DW,D,AT		1250		DT	1.2	6.7	26.7	53.3		1.3
G4-1190.1	P,TP	DW,D,AT		1273	0.4	DT	1.3	12.5	31.3	50		1.4
G4-1244.3	P,TP	DW,D,AT		1330	21.4	DT	1.1	13.3	40	40		1.25
G4-1281.9	P,TP	DW,D,AT		1380	9.1	DT	1.2	5.9	35.3	52.9		1.55
G4-1296.3	P,TP	M-DW,AT		1296	0.9	DT	1.5	5.3	36.8	47.4		1
G4-1330.7	P,TP	DW,V,AT		1250	2.2	DT	0.9		27.3	63.6		1.2
G4-1371.2	P,TP	NW,AT		1300	2.0	DT	1.1		20	80		1.8
G4-1382.7	P,TP	N-PW,AT		1330	5.2	DT	1.2		31.2	56.3		0.8
G4-1390.2A	P,TP	NW,AT		4974	1.7	RL	0.5		21	42		0.6
G4-1390.2B	P,TP	NW,AT		1400	1.3	DT,SP	0.5	14.3	14.3	57.1		0.6
G4-1400.4A	P,TP	NW,AT		1435	7.5	DT	0.9	7.7	38.5	53.9		1.3
G4-1400.4B	P,TP	NW,AT		5374	7.4	G,POR,DRV	0.7	5	25	62		1.5
G4-1419.0	CH	NW,AT		1155	2.1	DT,GL	1.5	5.9	64.7	23.5		1.35
G4-1431.8	CH	NW,AT		1118	2.9		1.6	5.6	61.1	22.2		1
G4-1437.9	CH	NW,AT		774	5.3	SP	2.3	38.9	22.2	27.8		1.35
G4-1472.2A	CH	NW,AT		1450	1.7		1.8	53.9	19.2	15.4		0.9
G4-1472.2B	CH	N-PW,AT		5547	2.4	GL,POR,DRV	1.7	38	37	23		1.2
G4-1551.0	CH	NW,AT		1494	10.4	GL,SP	2.8	42.9	28.6	19.1		1.1
G4-1601.8	CH	NW,AT		1312	2.4	DT	2.1	40.7	37	22.2		0.7
G4-1685.0	CH	NW,AT		1430	27.2	DT,SI	2.6	62.2	16.2	21.6		1.4
G4-1761.8	CF,PP	NW,AT		1350	0.9	SI,L,DT	7.6	11.7	15.5	64.1		1.2
G4-1779.6	CF,PP	NW,D,AT		1300	0.3	DT,MD	7.3	15.8	48.4	32.6		1.65

Appendix 1A—continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenoocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
G4-220	18		2					1	17.9		tr	tr	tr			2		0.5	1.8	SFD-82
G4-231	5	tr	5					1.4	19.6		tr	tr	tr			4		0.5	7.8	SFD-82
G4-236.5	tr											tr	tr			1		0.4	4	SFD-82
G4-240.2	14		4					1.55	7.8		tr	tr	tr			4		0.55	1.7	SFD-83
G4-243.6	9			1				1.6	4.8		tr	tr	tr			7		0.9	3.3	SFD-83
G4-253	20	tr		4				1.5	12.1		tr	tr	tr			2		0.5	1	SFD-82
G4-272.6A	3			tr				0.6	3		tr	tr	tr			4		0.4	4	SFD-82
G4-272.6B	5		3						4.3							7			3.8	SFD
G4-280.8	15	tr	2					0.75	8.4		tr	tr	tr			2		0.6	1	SFD-83
G4-307.6	21		4					1.1	9.1	tr	tr	tr	tr			5		0.5	1.8	SFD-83
G4-383.3	4			tr				1.2	2.4		tr	tr	tr			5		0.5	3	SFD-83
G4-416.2	4						1	1.5	3.7		tr	tr	tr			2		0.6	1.5	SFD-83
G4-446.7	tr						tr				tr	tr	tr			1		0.4	3.7	SFD-83
G4-500.9	1							1.1	7.1		tr	tr	tr			1		0.14	7.1	SFD-83
G4-625.7								0.8	8.3			tr	tr							SFD-83
G4-694.8	tr						1		8.3				tr			1		0.2	8.3	SFD-83
G4-746.6	1							0.65	10				tr							SFD-83
G4-817.3	1		tr					0.6	7.7				tr							SFD-83
G4-934.2	tr						tr	0.2	2.6			tr	tr			tr		0.5	5.3	SFD-83
G4-934.2	1											tr	tr			2				SFD-83
G4-1026.0	1		tr					0.65	10				tr			1		0.25	10	SFD-83
G4-1089.0	1						1	0.65	18.2			tr	tr			3		0.28	27.3	SFD-83
G4-1117.8	1							0.9	6.7			tr	tr			1		0.4	6.7	SFD-83
G4-1190.1	tr											tr	tr			1	MG,HM	0.28	6.3	SFD-83
G4-1244.3	tr		tr					0.6	6.7			tr	tr			1		0.5		SFD-83
G4-1281.9	tr		tr										tr			1		0.5	5.9	SFD-83
G4-1296.3	1		tr	tr	tr			0.6	5.3			tr	tr			1		0.55	5.3	SFD-83
G4-1330.7	1							0.8	9.1			tr	tr							SFD-83
G4-1371.2	tr						tr	0.6				tr	tr							SFD-83
G4-1382.7	2							0.55	12.5				tr					0.14		SFD-83
G4-1390.2A	1								4		5		tr		21	3			12	FMB-83
G4-1390.2B	tr							0.45				tr	tr			1		0.28	14.3	SFD-83
G4-1400.4A	tr				tr			0.4								tr				SFD-83
G4-1400.4B	1								3		tr		tr			2			5	FMB-83
G4-1419.0	1							0.4	5.9				tr							SFD-83
G4-1431.8	2							0.7	11.1			tr	tr							SFD-83
G4-1437.9	2							0.35	11.1			tr	tr			tr				SFD-83
G4-1472.2	2							0.75	7.7							1		0.14	3.8	SFD-83
G4-1472.2	2					tr	tr		2							1			1	FMB-83
G4-1551.0	3							1.2	7.1				tr			1	MG	0.14	2.4	SFD-83
G4-1601.8								0.3					tr					0.3		SFD-83
G4-1685.0	tr						tr	0.55					tr							SFD-83
G4-1761.8	8			tr				0.8	7.8	tr		tr	tr			1		0.35	1	SFD-83
G4-1779.6	1						2	0.7	3.2			tr	tr							SFD-83

Appendix 1A—continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm,Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
64-1817.8	CF,PP	PW,AT		1400	0.9	SI,DT	8.9	14.4	60.8	24		1.6
64-1871.6	CF,PP	PW,AT		1435	1.3	SI,MD	13.2	6.9	41.3	50.3		1.9
64-1938.8	CF,PP	PW,AT		1450	3.5	MD,SI,DT	11.6	13.1	44.1	38.1		1.6
64-1989.4	CF,PP	NW,AT		1435	3.1	MV,MD-SI	9.7	11.5	42.5	43.2		2.2
64-2039.0	CF,PP	N-PW,AT		1380	7.3	DT,SI	8.9	14.6	33.3	49.6		2
64-2069.0A	CF,PP	PW,AT		5086	0.7	E	9.1	5.8	37	54		2.3
64-2069.0B	CF,PP	PW,AT		1320	1.7	MD,V	9.2	5.8	41.3	48.8		1.9
64-2089.9	CF,PP	PW,AT		1420	0.9	SI,MD	8.9	11.8	44.1	40.9		1.8
64-2131.5	CF,PP	PW,AT		1420	1.7		9.5	17.8	42.2	37		1.8
64-2202.3	CF,PP	NW,AT		1472	4.8	MD	11.1	14	46.3	39		1.7
64-2226.7A	CF,PP	NW,AT		1440	2.2	MD	7	5.9	49.5	40.6		2.1
64-2226.7B	CF,PP	N-PW,AT		5482	2.2	E,PL	7.9	8.5	44.8	43.9		2.6
64-2263.8	CF,BF	PW,D,AT		1435	0.5	DT	14.4	18.8	30.9	42.5		1.65
64-2285.3	CF,BF	PW,D,AT		1435	0.2	MD	12.1	21.3	34.5	40.8		2.1
64-2354.9A	CF,BF	P-MW,D,AT		1435	0.1		16.5	30.8	35.4	27.9		2.6
64-2354.9B	CF,BF	DW,D,AT		5131		RL	17.1	32.1	31.3	32.6		3
64-2381.9	CF,BF	MW,D,AT		1428	0.1	L	15.5	18.6	33	43.9		2.5
64-2423.3	CF,BF	N-PW,D,AT		1430	0.1		16.6	24	39.9	30.3		1.7
64-2516.8	CF,BF	PW,D,AT		1400			17.1	24.3	30.5	40.2		2.1
64-2533.8	CF,BF	N-PW,D,AT		1450	2.6	SI	16.1	16.3	41.6	37.8		1.8
64-2551.6	CF,BF	N-PW,D,AT		1365	1.2	DT,SI	10.1	10.1	33.1	50		2.3
64-2598.8	CF,BF	MW,D,AT		1350	2.4	L,DT	9	5.8	30.6	51.2		1.6
64-2665.8	CF,BF	P-MW,D,AT		1430	3.0	MD,DT	10.8	9.1	35.1	47.4		2.1
64-2716.8	CF,BF	N-PW,D,AT		1385	0.8	DT	9	7.2	44	41.6		1.6
64-2731.5	CF,BF	NW,D,AT		1450	0.3	DT	9.5	14.5	44.2	37.7		2.1
64-2762.6	CF,TR	NW,D,AFT		1450	0.3		9.4	20.6	25	39.7		1.4
64-2788.3	CF,TR	PW,D,AT		1450	19.2	DT	7.5	15.7	23.1	50		1.65
64-2825.0	CF,TR	N-PW,D,AT		1350	5.0	DT	13.8	24.2	30.1	36.6		2.35
64-2840.4	CF,TR	PW,D,AT		1450	0.8	SP	12.7	29.3	31.5	34.8		2.2
64-2875.6A	CF,TR	PW,D,AT		1350	8.2	DT	10.8	37.7	25.3	34.3		2
64-2875.6B	CF,TR	MW,D,AT		5074	5.4	L	11.1	35.2	27	31.4		2
64-2964.3	CF,TR	PW,D,AT		1430	3.4	V	9	23.4	24.2	46.9		1.6
64-3000.9	CF,TR	MW,D,AT		1350	1.6	L	11.5	27.1	38.1	27.1		2.4
B-1H-2371	CF,BF	P-MW,AT		3066	0.3		15.9	23	33.5	38.5		1.85
B-1H-2443	CF,BF	MW,D,AT		3066	0.7	L?	8.1	16.1	32.3	44.4		1.8
B-1H-2465.3	CF,BF	PW,D,AT		3000	0.3	L?	15.7	34.5	29.4	33.4		2.4
B-1H-2566.4	CF,BF	PW,D,AT		3066			17.3	13.4	42	41.1		3
B-1H-2731	CF,BF	P-MW,AT		3066	5.1	L?,DT?,MD?	10.2	8.9	39.3	43.5		1.9
B-1H-2816	CF,BF	PW,D,AT		3000	7.7	WT,DT	10.8	11.4	35.4	49.5		2.5
B-1H-2916.2	CF,TR	PW,D,AT		3000	2.8	L,DT	13.9	24.2	28.8	42.4		2.05
B-1H-3027.1	CF,TR	PW,D,AT		3000	5.7	AT	11.2	30.9	30.6	33.5		2
B-1H-3181.8	CF,TR	MW,D,AT		2928	4.3	L	12.3	28.8	33.5	33.5		3
B-1H-3198	CF,TR	M-DW,D,AT		2922	2.5	L,DT	13.1	30.6	25.7	36.6		2.55
B-1H-3211	CF,TR	M-DW,D,AT		3066	17	L,DT	11.9	30.9	23.8	36.1		1.7

Appendix 1A--continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Mafic Phenocrysts Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenoocrysts Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
64-1817.8	1						tr	0.7	0.8			tr	tr			tr	MG	0.35		SFD-83
64-1871.6	tr			tr			2	1.1	1.1			tr	tr			1	MG	0.35	0.5	SFD-83
64-1938.8	tr	tr		tr			5	0.7	3			tr	tr			3		0.2	1.8	SFD-83
64-1989.4	2				2			0.5	2.8			tr	tr				MG			SFD-83
64-2039.0	1						tr	0.35	0.8			tr	tr			2		0.28	1.6	SFD-83
64-2069.0A					6		14		2.2		tr	tr	tr			5			1.1	FMB-83
64-2069.0B	tr				4		tr	0.45	3.3			tr	tr			1	MG	0.4	0.8	SFD-83
64-2089.9	tr						4	0.3	3.2			tr	tr				MG	0.4		SFD-83
64-2131.5	tr						4	0.6	3			tr	tr							SFD-83
64-2202.3	1						tr	0.65	0.6			tr	tr							SFD-83
64-2226.7A	tr						2	0.6	0.2			tr	tr			2	HM	0.3	2.5	SFD-83
64-2226.7B	1								2			tr	tr			11			2	FMB-83
64-2263.8	7	2						1.1	4.4			tr	tr			7		0.3	3.4	SFD-83
64-2285.3	2						1	0.7	1.8			tr	tr			3		0.6	1.7	SFD-83
64-2354.9A	10							1.1	4.2			tr	tr			4	MG	0.45	1.7	SFD-83
64-2354.9B	22	11		1					3.9			tr	tr			1			0.1	SFD-83
64-2381.9	7						tr	0.7	3.2			tr	tr			3		1	1.4	FMB-83
64-2423.3	6						5	1.1	4.6			tr	tr			3		0.3	1.3	SFD-83
64-2516.8	9						1	1.2	4.2			tr	tr			2		0.45	0.8	SFD-83
64-2533.8	6	tr					2	1	3.5			tr	tr			2		0.35	0.9	SFD-83
64-2551.6	5							0.8	3.6			tr	tr			4		0.45	2.9	SFD-83
64-2598.8	10	1					2	1.2	10.8			tr	tr			2		0.55	1.7	SFD-83
64-2665.8	4						3	0.9	4.5			tr	tr			6		0.5	3.9	SFD-83
64-2716.8	6						2	1.1	6.4			tr	tr			1		0.35	0.8	SFD-83
64-2731.5	1							0.7	0.7			tr	tr			4		0.5	2.9	SFD-83
64-2762.6	18							1	13.2			tr	tr			2	MG		1.5	SFD-83
64-2788.3	11							2	10.2			tr	tr			1		0.3	0.9	SFD-83
64-2825.0	14	1						1.45	8			tr	tr			2		0.45	1.1	SFD-83
64-2840.4	6							0.7	3.3			tr	tr			2	MG	0.45	1.1	SFD-83
64-2875.6A	1							0.7	0.7			tr	tr			3		0.4	2.1	SFD-83
64-2875.6B	32						1	0.1	5.9			tr	tr			3			0.5	FMB-83
64-2964.3	6							0.6	4.7			tr	tr			1		0.3	0.8	SFD-83
64-3000.9	9						1	1.3	6.4			tr	tr			2		0.3	1.3	SFD-83
B-1H-2371	14						6	0.7	4.1			tr	tr			4		0.25	0.8	SFD-84
B-1H-2443	11						2	0.7	5.2			tr	tr			5		0.4	2	SFD-84
B-1H-2465.3	9	1						0.55	2.1			tr	tr			3		0.3	0.6	SFD-84
B-1H-2566.4	11						3	1.1	2.7			tr	tr			5		0.5	0.9	SFD-84
B-1H-2731	4						2	1	1.9			tr	tr			20		0.45	6.4	SFD-84
B-1H-2816	7						tr	0.9	2.2			tr	tr			5		0.4	1.5	SFD-84
B-1H-2916.2	17	tr						1	4.1			tr	tr			2		0.4	0.5	SFD-84
B-1H-3027.1	15							0.9	4.4			tr	tr			2		0.35	0.6	SFD-84
B-1H-3181.8	12	tr						1	3.3		tr	tr	tr			3		0.3	0.8	SFD-84
B-1H-3198	23						1	0.8	6.3			tr	tr			3		0.3	0.8	SFD-84
B-1H-3211	30	tr						1	8.2		tr	tr	tr			4			1.1	SFD-84

Appendix 1A--continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm,Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
B-1H-3277.7	CF,TR	P-MW,D,AT		1300	19.8	ML,RL,MD,IL	13.8	33.3	23.3	36.7		1.8
B-1H-3293.6	CF,TR	M-DW,D,AT		3066	11.4	L,DT	14.7	29.3	27.3	37.8		1.75
B-1H-3296.5	CF,TR	MW,D,AT		1040	5.1	ML,DRV,AX,MD	16.2	26.8	35.1	33.3		1.7
B-1H-3519.4	CF,TR	PW,AT		1400	42.1	RL,DRV,AX,AL	7.4	32.7	23.1	38.5		2.6
B-1H-3999	LR	MW,D,AT		1600	5.9	ML,RL,AX,DRV,IL	13.8	3.6	23.1	65.2		2.5
C1-1315.0	P,TP	PW,D,AT		3000	5	SI?,DT,L?	1.6	10.2	26.5	53.1		1.4
C1-1327.3	P,TP	P-MW,D,AT		3000	6.9	DT,L?,SI	1.4	17.1	29.3	46.3		1.5
C1-1522.3	CH	PW,AT		3000	9.1	DT,MD?,GL	1.8	25.5	45.5	27.3		1.4
C1-1702.5	CF,PP	NW,D,AT		3000	1.5	SI,DT	5.7	23.3	55.2	13.4		2.1
C1-1878.2	CF,PP	P-MW,D,AT		3066	3	DT,MD/SI	8.5	9.5	45.8	37.8		2.1
C1-2067.1	CF,PP	PW,D,AT		3066	4.6	MD/SI,DT	7.1	6.4	38.4	53		1.8
C1-2159.5	CF,BF	P-MW,D,AT		3066	0.7	DT,L	10.9	17.7	35.3	39.5		2.2
C1-2347.9	CF,BF	M-DW,D,AT		3066	0.03	DT	21.9	26.2	34.1	34.8		2.7
C1-2607.2	CF,BF	N-PW,D,AT		3000	1.8	DT,L,SI?	8	14.2	29.7	46.4		1.7
C1-2785.4	CF,TR	BR		2274	55.2	DT,L,MD,SD	2.2	36	28	30		1.45
C1-2992.9	CF,TR	N-PW,D,AT		2986	28.7	L,SI,DT	7.5	31.3	36.2	26.3		1.65
C2-1344.6	CH	NW,AT		3000	3.6	R,GL,L	1.2	16.7	22.2	55.6		1.55
C2-1626.3	CH	BT		864	3.8	DRV	23.8	35	12.1	45.1		0.71
C2-1633.9	CH	BT		1584	0.9	DT,L	10.4	28	7.9	52.4		0.4
C2-1635.8	CH	BT		1490	1.8	WT,DT	22.4	24.6	9	57.2		1.4
C2-1642.8	CH	BT		792	62.8		24.3	3.6	1.6	83.4		0.71
C2-1745.9	CF,PP	N-PW,D,AT		1584	2.3	L?,MD	10	19	29.8	46.8		2.6
C2-1819.4	CF,PP	M-DW,D,AT		1500	1.5	L,MD	14.1	14.6	34.9	48.6		2.5
C2-2097	CF,PP	NW,D,AT		1490	2.8	MD/SI	7.7	8.7	46.1	43.5		2.3
C2-2103.1	CF,PP	NW,D,AT		1500	1.5	MD,DRV	6.8	5.9	48	42.2		1.65
C2-2110.0	BT	BT		1500				0.4		4.3		
C2-2278.7	CF,BF	M-DW,D,AT		1584	0.1	DRV	21.6	21.1	27.2	44.7		2.3
C2-2477.9	CF,BF	N-PW,D,AT		1584	0.8		15	29.8	31.5	32.8		2.5
C2-2683.6	BT	BT		1584				4.7	12.4			3.5
C2-2747.5	CF,TR	PW,D,AT		1584	4.9	L?,DRV	10.9	30.8	32	29.1		1.9
C2-2788.8	CF,TR	PW,D,AT		3066	0.8	AT,SD	9	42.2	29.8	22.9		1.65
H3-1840	CF,PP	N-PW,D,AT		1106	3.3	DT,SI,L?	10.7	10.2	41.5	40.7		2.1
H3-1930	CF,BF	PW,D,AT		1600	0.6	L,DT	7.7	12.2	19.5	59.3		2.6
H3-1980	CF,BF	PW,D,AT		1316	0.2		11.5	24.5	43.7	23.2		2
H3-2060	CF,BF	M-DW,D,AT		1600	1.8	L,DT	15.9	13.8	37.8	43.7		2.4
H3-2230	CF,BF	DW,D,AT		1600	0.3	DT	16.2	23.2	36.1	36.9		2.9
H3-2300	CF,BF	DW,D,AT		1800			12.9	23.2	30.9	39.1		1.8
H3-2360	CF,BF	PW,D,AT		2400	0.1	DT	13.8	17.3	32.1	44.9		2
H3-3460	CF,TR	N-PW,D,AT		1100	15.8	L,DT	9	23.2	18.2	50.5		1.2
H3-3475	CF,TR	N-PW,D,AT		1100	28.5	DT,L	9.5	40	16.2	29.5		1.7
H3-3560	CF,TR	NW,AT		1100	41	L,DT	8.5	41.9	19.4	33.3		1.2
H3-3575	CF,TR	N-PW,AT		1216	26.1	L,DT,SD	11	38.1	14.2	45.5		2.1
H3-3660	LR	N-PW,AT		2016	5.1	L,DT,SD	10.1	1.9	22.8	63.6		1.4
H4-1312	CH	NW,D,AT		2900	5.4	DT,GL	0.9	26.9	34.6	34.6		1

Appendix 1A—continued

YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenoocrysts				
B-1H-3277.7	9		3				tr	1.5	6.7		tr	tr	tr							FMB-81
B-1H-3293.6	22	tr						1.1	4.9		tr	tr	tr			3		0.3	0.7	SFD-84
B-1H-3296.5	6	1					tr	0.5	4.2		tr	tr	tr			1		1	0.6	FMB-81
B-1H-3519.4	6						tr	0.3	5.8		tr	tr	tr							FMB-81
B-1H-3999	14								6.3	tr		tr	tr	tr		4			1.8	FMB-81
C1-1315.0	2							0.4	4.1			tr	tr			3		0.5	6.1	SFD-84
C1-1327.3	3							0.5	7.3			tr	tr			tr		0.4		SFD-84
C1-1522.3	1							0.5	1.8			tr	tr			tr		0.3		SFD-84
C1-1702.5	6						2	1.15	4.7			tr	tr			6		0.4	3.5	SFD-84
C1-1878.2	1						12	1.05	5	tr		tr	tr			5		0.4	1.9	SFD-84
C1-2067.1	1						1	0.8	0.8			tr	tr			3		0.4	1.4	SFD-84
C1-2159.5	15						3	1.5	5.4	tr		tr	tr			7		0.65	2.1	SFD-84
C1-2347.9	17						2	1.1	2.8	1		tr	tr		0.2	13		0.5	1.9	SFD-84
C1-2607.2	17						2	1	7.9			tr	tr			4		0.3	1.7	SFD-84
C1-2785.4	2						1	0.3	6			tr	tr							SFD-84
C1-2992.9	8	tr						1.2	3.6			tr	tr			6		0.4	2.7	SFD-84
C2-1344.6	1							1	2.8			tr	tr			1		0.2	2.8	SFD-84
C2-1626.3	9								4.4			tr	tr			7			3.4	SFD-84
C2-1633.9	18							0.15	11			tr	tr			1		0.15	0.6	SFD-84
C2-1635.8	26							1.5	7.8		tr	tr	tr			5		0.4	1.5	SFD-84
C2-1642.8	10							0.06	5.2			tr	tr			12			6.2	SFD-84
C2-1745.9	1						4	1.4	3.1			tr	tr			2		0.3	1.3	SFD-84
C2-1819.4	1						2	0.65	1.4			tr	tr			1		0.5	0.5	SFD-84
C2-2097	1							0.4	0.9			tr	tr			1		0.55	0.9	SFD-84
C2-2103.1	1							0.3	1			tr	tr			3		0.4	2.9	SFD-84
C2-2110.0																				SFD-84
C2-2278.7	13	3						1.25	4.7	tr		tr	tr			8		0.6	2.3	SFD-84
C2-2477.9	5	7						2	5			tr	tr			2		0.5	0.8	SFD-84
C2-2683.6																				SFD-84
C2-2747.5	13						tr	1	7.6			tr	tr			1		0.45	0.6	SFD-84
C2-2788.8	12							1.4	4.4			tr	tr			2		0.2	0.7	SFD-84
H3-1840		3		2				0.5	4.2			tr	tr			4		0.4	3.4	SFD-84
H3-1930	6	2						1.2	6.5			tr	tr			3		0.4	2.4	SFD-84
H3-1980	9	1						0.7	6.7			tr	tr			3		0.5	2	SFD-84
H3-2060	8	3						1	4.3			tr	tr			1		0.4	0.4	SFD-84
H3-2230	4	2						1.1	2.3			tr	tr			4		0.7	1.5	SFD-84
H3-2300	9	6						1.9	6.5			tr	tr			1		0.5	0.4	SFD-84
H3-2360	12						tr	1.3	3.6			tr	tr			7		0.4	2.1	SFD-84
H3-3460	7							0.5	7.1			tr	tr			1		0.3	1	SFD-84
H3-3475	12							1.4	11.4			tr	tr			3		0.4	2.9	SFD-84
H3-3560	4							1.1	4.3			tr	tr			1		2.5	1.1	SFD-84
H3-3575	3	tr						0.7	2.2			tr	tr			tr		0.3		SFD-84
H3-3660	14	4						1.1	8.7	2		tr	tr		0.1	4		0.4	1.9	SFD-84
H4-1312	1							0.3	3.8			tr	tr			tr		0.2		SFD-84

Appendix 1A—continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm, Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
H4-1420	CH	NW,D,AT		2100	12.4	GL,DT	2	21.9	53.7	19.5		2.3
H4-1455	CH	N-PW,D,AT		2900	5.8	L,DT,SD	2.6	44	33.3	21.3		1.2
H4-1550	CH	NW,D,AT		2700	3.4	L,DT,SD?	1.6	61.4	13.6	22.7		1
H4-1656	CF,PP	PW,D,AT		3000	0.8	SI,AF	8.3	12.9	37.5	48.4		1.85
H4-1665	CF,PP	PW,D,AT		1200	0.5	SI/MD,AF	5.8	15.7	50	32.9		1.7
H4-1720	CF,PP	PW,D,AT		2000	0.6	SI/MD,AF	9.9	9.6	39.9	44.9		1.5
H4-1735	CF,PP	PW,D,AT		1181	0.1	SI,AF	15.1	23.6	39.3	35.4		2.4
H4-1785	CF,PP	PW,D,AT		949	2.6	MD	17.9	11.8	42.4	43.5		1.7
H4-1805	CF,PP	PW,D,AT		530	0.5	MD?,L?	10.2	7.4	35.2	51.9		1.5
H4-2060	CF,PP	PW,D,AT		1330	0.6	SI,L	9	9.2	39.2	47.5		2.6
H4-2250	CF,PP	PW,AT		1400	3.4	SP,GL,DT,SI	8.5	12.6	35.3	50.4		2.15
H4-2430	CF,BF	P-MW,D,AT		1714	0.1		20.2	29.7	34	32		2.2
H4-2520	CF,BF	MW,D,AT		1094	2.7	L?,AF	13.6	8.7	40.3	47		1.7
H5-1667	P,TP	P-MW,D,AT		2500	0.4	DT	1.2	3.2	29	58.1		1.1
H5-1800	CH	N-PW,AT		1606	21.4	DT,GL	1.7	33.3	33.3	29.6		1.15
H5-1852	CH	N-PW,AT		1534	5.8	DT,GL	2.3	50	2.8	41.7		0.8
H5-1917	CH	AFT		2304	3.8	DT,GL	21.9	40.8	23.6	31.3		1.85
H5-1960	CF,PP	N-PW,AT		1466	0.8	L,SI	4.4	14.1	31.3	51.6		1.25
H5-1966	CF,PP	NW,AT		2500	1	SI,AT,GL	6.4	21.3	36.8	36.2		1.6
H5-2020	CF,PP	PW,D,AT		1789	0.4	SI,MD,DT,L	10.3	10.3	44	42.4		1.6
H5-2660	CF,BF	PW,D,AT		1850	0.3		2.3	11.6	48.8	34.9		1.5
H5-2690	CF,BF	MW,D,AT		1306	0.2	L	16.4	19.6	32.2	41.1		2
H5-2710	CF,BF	PW,D,AT		1331	1.1	SI,L?	10.1	5.2	35.8	55.2		1.8
H5-2800	CF,TR	PW,D,AT		1735	0.6	DT,L?	12.8	28.3	28.7	34.5		2.1
H5-3520	L	D		1363			35.6	0.4	0.2	59.8		3.65
H5-3620	L	D		1328			30.4		0.5	75		3.2
H5-3960	L	D		908			30.8	0.4		76.8		2.6
H6-1165	P,TP	DW,D,AT		3000	7.6	DT,SI?	0.9	7.4	22.2	59.3		1.3
H6-1380.6	CH	NW,AT		3066	3.2	DT,GL	1.4	39.5	32.6	25.6		1
H6-1426.3	CH	N-PW,AT		3066	3.9	L,DT,FBR	1.5	31.9	40.4	23.4		1.5
H6-1510.1	CF,PP	PW,AT		1500	1.1	SI/MD,GL,DT	7.1	16	36.8	46.2		1.4
H6-1517.3	CF,PP	N-PW,AT		1500	13.3	MD,SI,AF	6.4	13.5	35.4	46.9		1.5
H6-1672.3	CF,PP	PW,D,AT		3066	14.9	SI,MD,L,DT	10.8	15.1	41.9	39.8		2
H6-1838.2	CF,BF	PW,D,AT		1300	2.5	L	14	20.9	28	45.1		2.4
H6-1920	CF,BF	PW,D,AT		1312	0.2		17.6	15.2	23.8	50.2		2.2
H6-1950	CF,BF	PW,D,AT		1985	0.4	AF,SE	18	24	32.4	38		2.2
H6-2051.4	CF,BF	P-MW,D,AT		1584	0.1	L?	18.9	23.3	37.3	36.3		2.9
H6-2130	CF,BF	PW,D,AT		2115			18.7	17.9	32.1	40.9		2
H6-2160	CF,BF	PW,D,AT		1062	0.1	GL,DT	16.6	14.2	30.7	48.9		1.7
H6-2354.4	CF,TR	PW,D,AT		2794	0.3	DT,L,SE	10.4	24.2	33	35.4		2.5
H6-2362	CF,TR	N-PW,D,AT		3000	2.5	GL,L,DT	10	27.7	26	42		1.9
H6-2866	CF,TR	NW,AT		1471	10.6	L,DT	8.9	21.4	34.4	35.9		1.3
H6-3003	L	L		2508			28.2			73.1		2.9
H6-3080	L	L		1716	0.4		28.8			72.5		3.85

Appendix 1A--continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenoocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
H4-1420	2							0.5	4.9				tr			tr		0.4		SFD-84
H4-1455	1							0.4	1.3			tr	tr			tr		0.25		SFD-84
H4-1550	1							0.5	2.3			tr								SFD-84
H4-1656	2						1	0.55	1.2			tr	tr			tr		0.4		SFD-84
H4-1665	1						tr	0.6	1.4			tr	tr			tr		0.28		SFD-84
H4-1720	6							0.4	3							5		0.3	2.5	SFD-84
H4-1735	2						tr	0.4	1.1			tr	tr			1		0.3	0.6	SFD-84
H4-1785	1						2	0.6	1.8			tr	tr			1		0.3	0.6	SFD-84
H4-1805	1						2	0.8	5.6			tr	tr			tr		0.3		SFD-84
H4-2060	2	1		tr				0.3	2.5			tr	tr			2		0.4	1.7	SFD-84
H4-2250	2						tr	0.6	1.7			tr	tr			tr		0.3		SFD-84
H4-2430	9						1	1	2.9			tr	tr			5		0.5	1.4	SFD-84
H4-2520	4	tr						1.1	2.7			tr	tr			2		0.6	1.3	SFD-84
H5-1667	2						tr	0.8	6.5			tr	tr			1		0.3	3.2	SFD-84
H5-1800	1							0.4	3.7		tr	tr	tr							SFD-84
H5-1852	1							0.4	2.8			tr	tr			1		0.3	2.8	SFD-84
H5-1917	21							0.6	4.2			tr	tr			1		0.3	0.2	SFD-84
H5-1960	tr	tr		tr			tr	0.55				tr	tr			2		0.3	3.1	SFD-84
H5-1966	2	tr		4				1.1	3.8			tr	tr			3		0.3	1.9	SFD-84
H5-2020	1			2				0.7	1.6			tr	tr			3		0.55	1.6	SFD-84
H5-2660	1	tr		1				0.6	4.6			tr	tr			tr		0.2		SFD-84
H5-2690	14							1.75	6.5			tr	tr			1		0.4	0.5	SFD-84
H5-2710	4	1						0.6	3.7			tr	tr			tr		0.25		SFD-84
H5-2800	16						1	1.2	7.6			tr	tr			2		0.3	0.9	SFD-84
H5-3520	72	106		tr				3	36.7			tr	tr			14		0.4	2.9	SFD-84
H5-3620	21	67						2.5	21.8			tr	tr			11		0.4	2.7	SFD-84
H5-3960	32	23						1.25	19.6			tr	tr			9		0.35	3.2	SFD-84
H6-1165	1							0.4	3.7			tr	tr			2		0.3	7.4	SFD-84
H6-1380.6	1	tr						0.35	2.3			tr	tr			tr		0.14		SFD-84
H6-1426.3	1	tr						0.3	2.1			tr	tr			1			2.1	SFD-84
H6-1510.1	tr	tr	tr					0.7				tr	tr			1		0.4	0.9	SFD-84
H6-1517.3	tr	tr	1					0.9	1		tr	tr	tr			3		0.3	3.1	SFD-84
H6-1672.3	2	tr					6	0.7	2.4			tr	tr			3		0.3	0.9	SFD-84
H6-1838.2	6	3						1.1	4.9			tr	tr			2		0.35	1.1	SFD-84
H6-1920	15	6						1.7	9.1			tr	tr			4		0.4	1.7	SFD-84
H6-1950	14							1.3	4.7			tr	tr			3		0.3	0.8	SFD-84
H6-2051.4	6	2						1.05	2.7			tr	tr			1		0.6	0.7	SFD-84
H6-2130	29							1.35	7.3			tr	tr			7		0.4	1.7	SFD-84
H6-2160	7							0.75	4			tr	tr			4		1	2.3	SFD-84
H6-2354.4	18						1	1.4	6.5			tr	tr			2		0.4	0.7	SFD-84
H6-2362	9	tr						0.65	3			tr	tr			4		0.35	1.3	SFD-84
H6-2866	8	1						0.7	6.9			tr	tr			2		0.2	1.5	SFD-84
H6-3003	69	94						2.6	23.1			tr	tr			27		0.6	3.8	SFD-84
H6-3080	42	72		tr				2.3	23.1			tr	tr			22		0.8	4.4	SFD-84

Appendix 1A—continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm,Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Felsic Phenocrysts: Phen (%)	Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
H6-3191.4	L	D,L		1562	2.3		32.3			73.1		2.35
H6-3360	L	L		1100			31.7		0.3	75.6		2.4
H6-3402.9	L	D,L		1562			32.2			72		3.2
H6-3550	L	D,L		1521			23.3	0.1		64.2		2.6
H6-3605.7	L	L,DA		2788	2	L,GL	26.2			18.8		2.5
H6-4001.9	LR	NW,AT		3096	24.7	L,SP	7.8	4.6	30	57.5		1.7
J13-1883	CF,PP	M-DW,D,AT		1300	1.6	E	12.5	10.5	54.3	32.1		3
J13-2011	BT	BT		1200	4.7	IL,DRV	8.3		50	43		1.5
J13-2132	CF,BF	DW,D,AT		1400	0.5	IL,DRV	18.6	18.5	39.6	36.5		4
J13-2183	CF,BF	M-DW,D,AT		1400			18.9	22.7	36.4	32.6		3
J13-2382.5	CF,TR	N-PW,D,AT		3700	0.7	RL,IL,ML,R,TWB	8.6	17	40.7	36.3		1.9
J13-2532.1	CF,TR	MW,D,AT		1500	0.9	CL,RL	10.7	25.5	34.8	29.8		2.5
J13-2684	CF,TR	DW,D,AT		1200	3.4	IL,G,DRV	12.3	32	32	29.3		2
J13-2685.2	CF,TR	DW,D,AT		1500	1.4	IL,DRV	13.9	30.8	26.4	34.1		1.8
J13-2843	CF,TR	DW,D,AT		1500	0.8	L,DRV	14.9	34.8	31.7	25.4		2.5
J13-2998	CF,TR	PW,D,AT		1500	13.5	IL,DRV	7.9	27.1	30.5	39.8		1.5
J13-3005	CF,TR	PW,AT		3700	8.4	DRV,IL-RL	8.5	32.1	27	34		1.7
J13-3030	CF,TR	PW,AT		500	7.0	DRV,IL-RL	13	39	26	30		1.6
J13-3110	CF,TR	PW,AT		1000	2.0	IL,DRV	9	20	52	26		1.6
J13-3150	CF,TR	N-PW,AT		1200	2.0	AX,DRV,IL	7	18	35	44		1.3
J13-3190	CF,TR	NW,AT		500	4.0	DRV,L	5	27	38	27		0.5
J13-3200	CF,TR	NW,AT		500	2.0	DRV,L	4	18	36	36		1
J13-3246	LR	PW,AT		3500	8.7	IL,DRV,AX,TWB	9.2	2.5	21.7	71.2		2
J13-3290	LR	PW,D,AT		500	5.0	DRV,AX	15	1	18	74		1.5
J13-3450	LR	PW,D,AT		1100	23.0	DRV,IL,AX	10.7	8.5	39	49		2
WT1-1682.4	CF,BF	MW,D,AT		2296	0.4		20.9	24	37.1	34.6		2.1
WT2-2054	CF,PP	DW,D,AT		3000	0.1	SI,DT	18.2	16.3	28.2	49.3		2.8
WT2-2055.6	CF,PP	DW,D,AT		3066	0.8	MD,SI,L?,DT?	20.1	12.7	27.8	51.9		1.9
WT3-1140.0	CF,BF	DW,D,AT		1870	0.7		19.9	24.7	34.6	32.2		2.2
WT4-1571.3	CH	NW,D,AT		1584	3	DT	2.4	15.8	50	28.9		1.7
WT6-320-330	P,TP	M-DW,D		825	0.5	DT	1.2		20	60		1
WT6-390-400	CH	D,L		921			0.8	28.6	57.1	14.3		1.4
WT6 650-660	CH	D,L		820			1.8	66.7	13.3	13.3		2.5
WT6-870-880	CH	D,L		1043		SP	1.3	61.5	7.7	23.1		1.25
WT6-1251.1	CH	L		2378	0.1	G?	4.7	37.5	25.9	35.7		2.1
WT6-1255.1	CH	D,L		2080			4.2	40.9	15.9	39.8		1.5
WT7-1604.8	CF,PP	PW,D,AT		3000	0.3	DT?,SI,MD	11.6	11.2	49.1	36.8		2.5
WT11-1442.8	CH	N-PW,D,AT		2922	9.9	DT,GL	3	37.9	25.3	33.3		1.4
WT12-1302.2	CH	N-PW,D,AT		3066	3.5	DT,GL	1.1	24.2	15.2	51.5		1.1
WT13-1151	P,TP	MW,D,AT		2226	1.1	SP,DT	0.7		12.5	56.3		0.75
WT14-1309.8	CH	PW,AT		2928	4.3	DT,GL	1.7	29.4	23.5	43.1		1.5
WT15-1355	P,TP	DW,D,AT		3000	2.6	DT	1.4	12.2	34.1	48.8		1
WT15-1356.1	P,TP	DW,D,AT		3000	3.3	DT,RT	1.3	10.5	39.5	36.8		1.3
WT16-1090	CH	L		2000			1.8	41.7	11.1	47.2		1.9

Appendix 1A--continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenoocrysts				
H6-3191.4	26	87						1.9	22.3			tr	tr			23		0.7	4.6	SFD-84
H6-3360	25	49						1.7	21.2			tr	tr			10		0.35	2.9	SFD-84
H6-3402.8	41	81						3.5	24.3			tr	tr			19		0.7	3.8	SFD-84
H6-3550	35	72						2	30.2			tr	tr			19		0.65	5.4	SFD-84
H6-3605.7	73	111						2.2	25.2			tr	tr			21		1.4	2.9	SFD-84
H6-4001.9	11	1						0.6	5	tr		tr	tr			7			2.9	SFD-84
J13-1883							4		2.5				tr			1			0.6	FMB-77
J13-2011									3				tr						4	FMB-77
J13-2132	7	tr					5		4.6			tr	tr			2			0.8	FMB-77
J13-2183	13	tr					5		6.8				tr			4			1.5	FMB-77
J13-2382.5	16								5	tr		tr	tr			3			0.9	FMB-81
J13-2532.1	14						1		9.3			tr	tr			1			0.6	FMB-77
J13-2684	8						1		6.1				tr			1			0.7	FMB-77
J13-2685.2	15						1		7.7				tr			2			1	FMB-77
J13-2843	13						4		7.6				tr			1			0.4	FMB-77
J13-2998	1								1			tr	tr			1			0.8	FMB-77
J13-3005	17								5.4			tr	tr			5			1.6	FMB-81
J13-3030	2								3							1			2	FMB-81
J13-3110	1								1											FMB-81
J13-3150	3								3											FMB-81
J13-3190	2								8		tr		tr							FMB-81
J13-3200	1								5			tr	tr			1			4	FMB-81
J13-3246	2						4	1.5	1.8	tr	tr	tr	tr			9			2.8	FMB-80
J13-3290	tr	tr						0.7		tr		tr	tr			5			7	FMB-81
J13-3450	2								1.7		tr	tr	tr			2			1.7	FMB-81
WT1-1682.4	13	3						0.9	3.3			tr	tr			5		0.8	1	SFD-84
WT2-2054	20						7	1.55	5	1		tr	tr		0.2	6		0.7	1.1	SFD-84
WT2-2055.6	28						10	1.1	6.2			tr	tr			9		0.5	1.5	SFD-84
WT3-1140.0	13	11						1.55	6.4			tr	tr			8		0.45	2.1	SFD-83
WT4-1571.3	2							0.5	5.3							tr		0.25		SFD-85
WT6-320-330	1							0.25	10			tr	tr			1		0.3	10	SFD-83
WT6-390-400	tr							0.4												SFD-83
WT6 650-660	1							0.3	6.7							tr		0.14		SFD-83
WT6-870-880	tr			tr				0.4								1			7.7	SFD-83
WT6-1251.1	1			tr?				1.1	0.9			tr	tr			tr		0.3		SFD-83
WT6-1255.1	3							1	3.4							tr		0.25		SFD-83
WT7-1604.8	2						6	1	2.3			tr	tr			2		0.4	0.5	SFD-84
WT11-1442.8	3							0.5	3.5			tr	tr			tr		0.2		SFD-84
WT12-1302.2	2							0.55	6.1				tr			1		0.25	3	SFD-84
WT13-1151	tr							0.6				tr	tr			5		0.3	31.2	SFD-83
WT14-1309.8	2							0.8	3.9			tr	tr			tr		0.4		SFD-84
WT15-1355	1							0.5	2.4			tr	tr			1		0.28	2.4	SFD-84
WT15-1356.1	2						2	0.55	10.6				tr			1		0.2	2.6	SFD-84
WT16-1090	tr							0.3				tr	tr			tr		0.25		SFD-84

Appendix 1A—continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Fm, Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
WT16-1210	CH	L		2000			2	63.4	19.5	12.2		1.65
WT16-1290	CH	L		1160			4.4	41.2	15.7	37.3		2.4
WT16-1704	CH	D,L		3000			2.7	13.4	37.8	41.5		2
WT16-1708.4	CH	D,L		3066			2.6	21.5	49.4	16.5		2.1
WT17-810	P,TP	DW,D,AT		1400	2.3	DT	1.1	6.7	13.3	80		1.8
WT17-1100	CH	NW,AT		1400	13.1	DT,RT,L?,SP	3.1	32.6	25.6	34.9		1.1
WT17-1350	CF,PP	NW,D,AT		1401	0.5	DT,MD?	9.7	12.5	39.7	44.9		1.9
WT18-2037.4	CH	NW,D,AT		1584	1.9	DT	2.7	37.2	25.6	32.6		1.4

Appendix 1A--continued
YUCCA MOUNTAIN DRILL HOLE SAMPLE MODES

Sample number	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenoocrysts				Analyst, date
	Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	
WT16-1210	1							0.6	2.4				tr			1		0.3	2.4	SFD-84
WT16-1290	2							0.75	3.9			tr	tr			1		0.3	2	SFD-84
WT16-1704	3	tr						0.85	3.7			tr	tr			3		0.5	3.7	SFD-84
WT16-1708.4	5	tr?						1	6.3				tr			5		0.6	6.3	SFD-84
WT17-810	tr	tr					tr	0.5				tr	tr			tr		0.28		SFD-84
WT17-1100	2							0.3	4.7			tr	tr			1		0.25	2.3	SFD-84
WT17-1350	4						tr	0.6	2.9			tr	tr			tr		0.4		SFD-84
WT18-2037.4	1							0.75	2.3			tr	tr			1		0.7	2.3	SFD-85

APPENDIX 1B

Additional data for Yucca Mountain drill hole sample modes
(Depths in feet with the exception of USW G-3/GU3)

Appendix 1B

Drill hole number, depth	Additional data
G1-1561.8	Zeolitic. Quartz slightly resorbed.
G1-1689.5	Zeolitic. Quartz very slightly resorbed.
G1-1811.7	Montmorillonite estimated at 15 percent.
G1-1943.4	Quartz moderately resorbed. No calcite. Vapor-phase crystals in pumice.
G1-2009.8	Zeolitic. Quartz moderately resorbed.
G1-2124.7	Quartz is wormy, alkali feldspar slightly wormy.
G1-2231.0	Quartz moderately resorbed.
G1-2246.0	Wormy quartz.
G1-2300.4	No lithics. Quartz moderately resorbed.
G1-2354.6	Wormy quartz. Incipient vapor-phase crystals.
G1-2397	Wormy quartz. Porous. Vapor-phase crystals. Apatite rare, partly resorbed.
G1-2461.5	Wormy quartz. Vapor-phase crystals.
G1-2470.6	Slightly wormy quartz. Vapor-phase crystals in pumice.
G1-2478.3	Partly wormy quartz. Vapor-phase crystals in pumice.
G1-2507	Wormy quartz.
G1-2555	LANL specimen. Quartz slightly resorbed, and wormy.
G1-2594.2	Quartz slightly resorbed. Montmorillonite estimated at 15 percent.
G1-2678.0	Quartz slightly resorbed. No calcite.
G1-2772.6	Quartz slightly resorbed. No calcite. Rather porous rock.
G1-2851.7	Quartz slightly to moderately resorbed. No calcite. Quartzo-feldspathic.

Appendix 1B--continued

Drill hole number, depth	Additional data
G1-2868	LANL specimen. Twb lithics. Quartz slightly resorbed, wormy.
G1-2931.4	Wormy quartz, slightly resorbed. No calcite. Quartzo-feldspathic groundmass.
G1-3013.9	Wormy quartz. No calcite. Potassium feldspar mantles plagioclase.
G1-3192.8	Quartz slightly resorbed. Argillized. Some pyrite. Estimated montmorillonite 20 percent.
G1-3196	LANL specimen. Quartz slightly resorbed, some wormy.
G1-3284.5	Quartz slightly resorbed, some wormy. Argillized. Minor calcite. Sparsely disseminated pyrite. Montmorillonite estimated at 20 percent.
G1-3515.1	Quartz very slightly resorbed. Argillized. Sparse pyrite.
G1-3724.0	Dacite flow. No zircon. Groundmass hydrated devitrified glass with sparse opaque dust and clay. Locally opal.
G1-3908.2	Dacite lava under Crater Flat. Unit: Vitrophyre. Rare calcite. No zircon. Incipient alteration and devitrification. Slightly seriate grading through micro-pheonocrysts to coarse microlites. Uralitic alteration of groundmass.
G1-3969	Member: (below rhyodacite lava) Quartz-poor. Twb lithics. Quartz slightly-moderately resorbed, some wormy. Argillized. Montmorillonite estimated at 20 percent.
G1-3992	15 percent clay minerals.
G1-4150.4	Some wormy quartz. Argillized. Montmorillonite estimated at 20 percent.
G1-4222.1	Zeolitic.
G1-4408	Quartz-poor unit. Quartz very slightly resorbed.
G1-4471	Quartz-poor unit. Quartz very slightly resorbed.
G1-4578.2	Quartz very slightly resorbed. Argillized.

Appendix 1B--continued

Drill hole number, depth	Additional data
G1-4758.4	Quartz very slightly resorbed.
G1-4849.0	Very little wormy quartz. Argillized. Calcite in groundmass.
G1-4917.0	Within 3 ft of base of unit. Quartz very slightly resorbed. Argillized.
G1-4946.4	Thin ash-flow tuff under Lithic Ridge tuff.
G1-4969.0	Thin ash-flow tuff under Lithic Ridge tuff. Axiolitic lithics are dominant. Few quartz, very slightly resorbed.
G1-5002.3	Quartz-rich tuff unit, uppermost part. Quartz slightly resorbed. Montmorillonite in pumice. Minor calcite.
G1-5045.0	Quartz-rich unit. Montmorillonite in larger pumice. Quartz slightly resorbed.
G1-5097.9	Quartz-alkali feldspar-rich unit. Large pumice in section--atypical. No pilotaxitic lava. Quartz slightly resorbed.
G1-5115.5	Quartz-alkali feldspar-rich tuff. Quartz slightly resorbed.
G1-5141.5	Quartz-alkali feldspar-rich tuff. Quartz slightly resorbed. Much calcite.
G1-5142.2	Quartz-alkali feldspar-rich unit. Quartz very slightly resorbed.
G1-5187.0	Quartz-alkali feldspar-rich tuff. Quartz slightly resorbed. Appears slightly hydrothermally altered. Calcite in groundmass.
G1-5265.6	Quartz-feldspar rich. Quartz slightly resorbed. Calcite in groundmass. Green chloritic alteration.
G1-5316.0	Bedded tuff under quartz-rich. Argillic(?) and silica alteration. Calcite.
G1-5322.0	Thin ash flow, 5320-5337 ft. Quartz slightly resorbed. Argillized, calcitized.
G1-5358.5	Thin tuff from 5350-5368 ft. Quartz not resorbed. Argillized, calcite in groundmass
G1-5373.7	Thin ash flow from 5370-5398 ft. Quartz slightly resorbed. Argillized, calcitized.

Appendix 1B--continued

Drill hole number, depth	Additional data
G1-5400.0	Thin ash flow from 5399-5422 ft. Quartz slightly resorbed. Argillized, silicified, and calcitized.
G1-5416.6	Thin ash flow from 5399-5422 ft: similar to lithic-rich tuff except pilotaxitic lava fragments. Quartz not resorbed. Argillized, calcitized.
G1-5438.2	Thin ash flow from 5434-5449 ft. Argillized, calcitized. Calcite veinlets 0.05 in. wide.
G1-5454.1	Bedded ash-fall tuff from 5449-5492 ft. Argillized, zeolitic. Many plagioclase grains resorbed.
G1-5496.1	Thin ash flow from 5492-5510 ft. 10-20 percent calcite in pumice and groundmass.
G1-5517.3	Thin ash flow from 5514-5527 ft. Minor calcite in groundmass and pumice.
G1-5540.0	Very thin 4 ft ash flow from 5539-5543 ft. Green chloritic mineral.
G1-5558.7	Very thin ash flow from 5555-5562 ft. Quartz wormy. Argillized pumice. Sparse calcite. This rock may be agglutinate or fused tuff.
G1-5600.0	Ash flow from 5563-5646 ft. Quartz slightly resorbed. Calcite.
G1-5642.0	Ash flow from 5563-5646 ft. Clay, calcite, and chlorite are alteration products. Also high relief, high birefringent aggregates = anatase(?).
G1-5728.0	202.8 ft ash-flow tuff. No quartz. Clay, calcite, and chlorite alteration.
G1-5841.0	202.8 ft ash-flow tuff. No quartz. Almost identical to upper part of G1-5728.0.
G1-5894.3	Lowermost of (202.8 ft+ 7 ft) ash-flow tuff. No quartz. This tuff is less altered than those above, but contains sphene after biotite.
G1-5929.8	Ash-flow tuff from 5899-5935 ft. Quartz resorbed. Clay, calcite, and chlorite alteration. Sphene after biotite.

Appendix 1B--continued

Drill hole number, depth	Additional data
G1-5944.9	Lowest ash flow from 5935.6-6000 ft TD (base not penetrated). Clay, calcite, chlorite, and sphene alteration.
G1-5980.0	Lowest ash flow from 5935.6-6000 ft TD (base not penetrated). Clay, calcite, chlorite, potassium feldspar, and sphene alteration products. Secondary potassium feldspar in groundmass. Zeolitic.
G1-5984.7	Lowest ash flow from 5935.6-6000 ft TD (base not penetrated). Alteration products as in G1-5980.0, but more calcite. Potassium feldspar in groundmass.
G2-769	Unit: Quartz latite. Plagioclase zoned and twinned, and embayed by biotite.
G2-880	Unit: Quartz latite. Granophyric devitrification. Some fibrous devitrification in voids.
G2-1149	Spherulitic devitrification. Crystal poor. Lithics are devitrified tuff fragments with plagioclase phenocrysts.
G2-1347.5	Silica-filled microfractures 0.5-0.8 mm. Plagioclase phenocrysts are partially broken. Sericite- and clay-lined microfractures also criss-cross the rock. It is along these fractures that the plagioclase phenocrysts are brecciated. Biotite altered to opaques.
G2-1517.2	Lava lithic fragments with plagioclase microlites. Devitrification obscures shard texture. Some plagioclase grains more corroded than others.
G2-1606.5	Material broken up but cemented together. Silica-filled microfractures within lithic material. Phenocrysts of plagioclase, quartz, opaques, biotite, and potassium feldspar are contained in the lithic fragments and lithophysae with vapor-phase crystallization. Matrix is composed of devitrified, very fine, glassy material (zeolite replacement) with comminuted crystals.
G2-1770	Quartz not resorbed.
G2-1863.0	Zeolite and clay alteration. Spherulitic spots.

Appendix 1B--continued

Drill hole number, depth	Additional data
G2-2075.0	Nonwelded tuff.
G2-2173	Voids lined with zeolite.
G2-2261	Zeolitic. Few quartz slightly resorbed.
G2-2328	Zeolitic. Few quartz slightly resorbed.
G2-2358	Zeolitic. Few quartz slightly resorbed.
G2-2499.7	Zeolitic. Few quartz slightly resorbed.
G2-2504	Zeolitic. Few quartz slightly resorbed.
G2-2551	Zeolitic.
G2-2602.8	Zeolitic. May be thick ash-fall tuff.
G2-2650	Few quartz slightly resorbed.
G2-2708	Quartzo-feldspathic groundmass. Quartz slightly to moderately resorbed.
G2-2755.0	Quartz slightly to moderately resorbed, wormy.
G2-2928.7	Argillic alteration. Fibrous devitrification products within pumice. Microfractures--some filled by quartz.
G2-3042	Zeolitized and argillized.
G2-3064	Quartz moderately resorbed, wormy. Zeolitic. Indurated with chloritic mineral.
G2-3108.1	Zeolitic. Quartz moderately resorbed, wormy. Chloritic.
G2-3122.2	Quartz moderately resorbed, wormy. Argillic. Green chloritic mineral in pumice.
G2-3143.5	Quartz moderately to strongly resorbed, wormy. Zeolitized and argillized.
G2-3159.4	Quartz moderately resorbed, wormy. Zeolitic. Greenish-gray clay mineral sparse in small randomly oriented pumice and interstitial. No biotite. May be ash-fall shard tuff.
G2-3216.7	Quartz slightly to moderately resorbed. Argillized. Smectitic clays in pumice. Zeolite (analcime?) replaces glass shards.

Appendix 1B--continued

Drill hole number, depth	Additional data
G2-3244.3	Quartz moderately resorbed, wormy. Zeolites and/or analcime replaces glass shards, but montmorillonite or similar mineral in pumice. Rare chlorite.
G2-3271	Wormy quartz. Zeolities replacing some potassium feldspar(?) phenocrysts.
G2-3285	Vapor-phase crystallization.
G2-3292.5	Crystal-rich caprock. Quartz moderately resorbed, wormy. Argillized.
G2-3294.0	No lithic fragments. Quartz moderately resorbed, wormy.
G2-3313.0	Quartz moderately resorbed, wormy.
G2-3326.0	Quartz moderately resorbed, wormy.
G2-3350.9	Granophyric devitrification. Many small broken(?) phenocrysts. Pumice outlines are barely discernible due to coarse devitrification products. Fibrous devitrification products within resorbed quartz phenocrysts. Lithics are dark, volcanic fragments with microlites of plagioclase and biotite.
G2-3362.1	Quartz moderately resorbed, wormy.
G2-3433.9	Quartz moderately resorbed, wormy.
G2-3475	Sericitic and argillic alteration, pumice somewhat compressed.
G2-3583.0	Glass shard matrix. Argillite and calcite (and sericite) alteration.
G2-3601	Lithic aggregate nearly 100 percent, with little or no tuffaceous matrix. Calcite and clay in groundmass. Contacts between lithics are concave-convex, sutured.
G2-3626	Lithic rich. Argillized. Minor calcite in matrix. Contacts between lithics are sutured.
G2-3730.5	Lithic rich. Slightly argillized and sericitized.

Appendix 1B--continued

Drill hole number, depth	Additional data
G2-3787.3	Lithic rich. Potassium feldspar replaced by epidote. Hard to distinguish small lithic fragments from groundmass, therefore groundmass count might be over estimated.
G2-3834	Lithic rich. Argillized and sericitized. Iron-oxide stained. Montmorillonite in pumice.
G2-3872.6	Lithic rich. Calcite common. Zeolitized pumice.
G2-3907.0	Lithic poor. Abundant calcite alteration. Numerous xenocrysts of plagioclase with same petrography as in xenoliths.
G2-4078	Zeolitic alteration of groundmass. Abundant calcite alteration. Crushed phenocrysts.
G2-4134.2	Dacite flow. May be within Lithic Ridge Tuff, but not Lithic Ridge. Calcite and green-clay alteration common. Spherulitic growth in groundmass.
G2-4170.5	May be Lithic Ridge affinity, but not because of lack of sphene. Very abundant calcite, which replaces plagioclase and groundmass. Fair amount of clay alteration. Hornblende highly altered.
G2-4185.4	May be Lithic Ridge affinity but no sphene present. Calcite alteration. Shear zones with sheared crystals. Apatite recrystallized in shear zones. A lot of green clay (illite?).
G2-4200.2	Very abundant calcite. Several generations of plagioclase: 1) highly resorbed, 2) altered by calcite, 3) rounded, and 4) euhedral sphene altered. Some green-clay alteration.
G2-4239.4	Quartz and plagioclase resorbed. Calcite and epidote alteration in groundmass.
G2-4348.8	Calcite alteration common in groundmass and plagioclase.
G2-4445.9	Plagioclase highly resorbed and altered.
G2-4568.0	No description.

Drill hole number, depth	Additional data
G2-4667.5	Pumice lenses devitrified. Calcite and sericite alteration. Lithics are devitrified fragments with hornblende pseudomorphs.
G2-4770.3	Calcite and sericite alteration. Lithics are pumice spheroids and fragments with pyroxene pseudomorphs and biotite.
G2-4838	Formation: Ash flow between Lithic Ridge and rhyolite lava. Correlates with unit C of older tuffs. LANL thin section.
G2-4841.2	Correlates with Unit C of older tuffs at G1-5438. Calcite alteration. Biotite has altered to magnetite and hematite. Some magnetite, but most of the opaques look secondary.
G2-5002.4	Rhyodacite lava with spherulites, below Lithic Ridge Tuff. Abundant spherulites in groundmass. Devitrified groundmass with abundant alteration to calcite, sericite and zeolites. Many zeolites in vesicles. Biotite highly altered to opaques and clay(?). Plagioclase partly altered to sericite. No flow banding in thin section.
G2-5109.7	Rhyodacite lava (rhyolite) with flow banding. Plagioclase almost totally sericite. Quartz-filled vesicles and veins.
G2-5195	Flow banded. Zircon associated with opaques. Secondary sphene granules after primary sphene(?). Quartz in matrix. Quartz-filled vesicles. Sericite and calcite alteration.
G2-5210.5	Quartz-latite lava. Calcite and sericite alteration. Hornblende and pyroxene have completely altered to feldspars and opaques (pyrite) plus some quartz. Quartz in matrix. Secondary sphene granules in altered mafics. Biotites are in various stages of alteration; some are fairly fresh, some are completely replaced. Clusters of mafics and plagioclase phenocrysts.
G2-5230.0	Quartz-latite lava. There is a great deal of apatite within the plagioclase grains and groundmass. Extensively altered. Calcite and sericite alteration, some chlorite. Fluorite (13 point counts) fills vesicles and centers of plagioclase phenocrysts. Vesicles are quartz lined.

Appendix 1B--continued

Drill hole number, depth	Additional data
G2-5318.8	Quartz-latite lava. Extensive alteration, especially calcite. Hornblende has been replaced by opaques, calcite, and feldspar. Biotite -> magnetite + hematite. Plagioclase -> calcite + sericite. Quartz in matrix. Calcite-, quartz-, and feldspar-filled vesicles--some void space.
G2-5403.0	Quartz-latite lava. Plagioclase has altered to muscovite, sericite, and calcite. Calcite alteration in groundmass. Quartz in matrix. Opaques are probably secondary.
G2-5490.0	Quartz-latite lava. Calcite alteration. Calcite-filled fracture. Quartz and potassium feldspar mainly in matrix. Some biotite phenocrysts are as altered as the hornblende and pyroxene, but others appear fresh.
G2-5591.2	Quartz latite. Calcite and sericite alteration in groundmass. Great deal of apatite in groundmass. Biotite has altered to granules of sphene and calcite. Abundant quartz in matrix. Some chlorite. Texture of the groundmass is coarser than overlying unit. Biotite -> white mica + some chlorite(?) with granules of sphene.
G2-5661.0	Unit between quartz-latite lava and dacite lava. Chlorite and calcite alteration. Plagioclase has altered to calcite. Biotite flakes bend around other phenocrysts. Biotite has altered to white mica. Lithic fragments have quartz-filled microfractures.
G2-5663.4	Unit between quartz-latite lava and dacite lava. Chlorite, calcite, and sericite alteration. Biotite altered to white mica.
G2-5670.2	Thin ash flow between rhyolite and quartz-latite lava. Calcite, and chlorite(?) alteration in radial clusters. Altered biotites carry needle-like apatites(?), small zircons, and secondary sphene. Biotite has altered to white mica.
G2-5690.6	Dacite. Calcite and chlorite alteration. Calcite-filled microfractures. Pyroxene -> chlorite -> calcite. A few altered mafics appear to have been biotite. Exsolution(?) textures of magnetite after pyroxene(?) or biotite(?).

Appendix 1B--continued

Drill hole number, depth	Additional data
G2-5783.0	Dacite lava. Abundant apatite within mafic pseudomorphs and plagioclase phenocrysts. Extensive microfractures are filled by quartz, potassium feldspar, and calcite. Some chlorite alteration. Quartz and potassium feldspar are rounded grains. Calcite alteration in groundmass. Plagioclase phenocrysts are zoned and twinned. Microfractures have offset lamellae in plagioclase.
G2-5923.2	Ash flow. Calcite and sericite alteration, some minor chlorite. Albite(?) crystallized in vesicles.
G2-5945.8	Unit: Older Tuffs (Bottom of USW-G2). Calcite, sericite, zeolite, and chlorite alteration. Probably hydrothermal albite.
G2-5986.9	Unit: Older Tuffs (Bottom of USW-G2). Wormy quartz, moderately resorbed. Clay, calcite, and sericite alteration. Secondary sphene.
G2-6005.6	Unit: Older Tuffs (Bottom of USW-G2). Secondary hydrothermal albite in groundmass.
GU3-11.66	Caprock, gray vapor phase. Extensive carbonate in groundmass (caliche?). Spherulitic growths in cavities. Alkali feldspar overgrowths on plagioclase. Tridymite vapor-phase. Alteration.
GU3-13.90	Upper cliff and upper lithophysal. Plagioclase core with alkali feldspar overgrowths. Long, fibrous to granophyric devitrified(?) groundmass and vapor-phase filled cavities.
GU3-23.89	Clinkstone zone. Granophyric and long fibrous calcite veinlet. Some alkali feldspar with plagioclase cores.
GU3-74.90	Lower lithophysal zone. Patchy spherulitic, fibrous devitrification. Tridymite growing in rare cavities. Plagioclase cores in some alkali feldspars.
GU3-92.56	"Hackly" zone. Alkali feldspar core in alkali feldspar. Spherulitic devitrification.

Appendix 1B--continued

Drill hole number, depth	Additional data
GU3-104.04	Subhorizontal parting at base of Hackly zone. Zone has different extremes--not eutaxitic but layered; shards flattened but inhomogeneous patches of different sizes, shapes, and materials. High concentration of pumice; few accessory minerals.
GU3-108.59	Vitrophyre (basal). Glass shards undevitrified and beautifully formed. Alkali feldspar still has inclusions of plagioclase.
GU3-129.33	Partially welded top--vapor phase. Plagioclase core in sanidine as free phenocrysts. Hematite platelets on crystals. Highly porous.
GU3-131.27	Caprock. Mafic glomerophenocrysts common (plagioclase, clinopyroxene, and magnetite). Plagioclase cores in alkali feldspar phenocrysts.
GU3-141.58	Lower caprock. Plagioclase glomerophenocrysts. Plagioclase cores of alkali feldspar.
GU3-160.23	Incipient lithophysal. Plagioclase inclusions in alkali feldspar. Granophyric groundmass. Vapor phase of tridymite, cristobalite, and sanidine.
GU3-193.03	Lithophysal unit. Spherulitic granophyric groundmass.
GU3-234.42	Absence of lithophysal cavities. Granophyric groundmass. Low phenocryst content.
GU3-291.04	Lithophysal unit. Plagioclase in cores of sanidine. Granophyric groundmass and spherules.
GU3-344.52	Mottled zone. Dendritic and granophyric spherulites. Fine fractures filled with quartz(?).
GU3-373.94	Vitrophyre unit. Small acicular cooling and hydration cracks.
GU3-397.00	No description.
GU3-419.6	Phenocrysts washed from sample of vitric ash--no fines--probably enhanced by washing. Alkali feldspar rim on plagioclase core--looks like Tpt.

Appendix 1B--continued

Drill hole number, depth	Additional data
GU3-430.69	Abundant calcite alteration of groundmass. Large pumice in groundmass. Plagioclase core of alkali feldspar.
GU3-438.75	Glassy (obsidian) lithics common.
GU3-456.68	Problem with obsidian lithics--grade into pumice; appear to be cognate; do not have phenocryst ratios of the matrix--from different part of magma chamber?
GU3-479.02	Uppermost nonwelded unit. Orthopyroxene with altered red rims--hornblende(?). Shredded biotite in matrix.
GU3-487.33	Nonwelded unit. Hematite crystals in groundmass. Some plagioclase extremely embayed.
GU3-488.62	Vapor-phase unit. Some sericite on plagioclase. Orthopyroxene pseudomorph -> opaques + clay.
GU3-531.54	Below vapor phase. Crushed crystals in pumice. Spherulitic growths and granophyric patches.
GU3-571.12	Lowermost unit. Glomerophenocrysts of plagioclase. Crystal-rich plagioclase and hornblende lava lithics. Hematite plates in groundmass.
GU3-605.40	Lowermost unit. Plagioclase riming Orthopyroxene.
GU3-615.33	Uppermost unit. Vitric groundmass. Hematite plates in groundmass.
GU3-631.04	More biotite-rich upper zone. Vapor-phase crystallization. Granophyric and spherulitic.
GU3-651.78	Plagioclase and sanidine in glomerophenocrysts. Groundmass is devitrified to a feathery and granophyric pattern and spherulites.
GU3-664.85	Patchy groundmass and spherulitic.
GU3-722.22	Granophyric and spherulitic groundmass.
GU3-752.00	No description.

Appendix 1B--continued

Drill hole number, depth	Additional data
GU3-785.61	Lowermost unit. Partially vitric. Spherulitic lithic fragments.
G3-800.77	Uppermost unit. Hematite stain on pumices.
G3-809.75	Upper portion.
G3-822.60	Upper portion.
G3-829.94	Upper unit. Vapor-phase crystallization. Aplite(?) granite in a granite lithic.
G3-853.88	Upper unit. Devitrified with coarse patchy growths superimposed on fine groundmass. Shards gone. Hematite platelets.
G3-873.82	Upper unit. Fine-grained devitrification and coarse patches--some glass shard ghosts left. Lots of hematite plates in groundmass.
G3-888.33	Upper unit. Hematite plates in groundmass. Devitrification to granular texture. Ghost shards present.
G3-928.22	Middle unit. Fine-grained granular and spherulitic devitrification of groundmass.
G3-936.38	Middle unit. Mantled volcanic lithic fragment. Groundmass with very fine devitrification with good, glass-shard relics.
G3-948.90	Middle unit.
G3-964.47	Vitrophyre middle unit. Very fine grained devitrification with good shard texture preserved. Some calcite in lithic fragments. Zeolites/clinoptilolite in pockets.
G3-983.28	Vitrophyre middle unit. Perlitic cracking in glass. Hornblende xenocrysts.
G3-1019.14	Lower unit. Plutonic granodiorite inclusion within lithic fragment.
G3-1049.00	Lower unit. Plutonic granodiorite inclusion within lithic fragment. Zeolite in groundmass cavities.
G3-1059.30	Lower unit. Clay alteration spots in groundmass.
G3-1122.49	Lower unit.

Appendix 1B--continued

Drill hole number,depth	Additional data
G3-1137	Lower unit.
G3-1145.74	Lowermost unit. Calcite alteration common. Granophyric texture. Xenocryst of quartz. Pyrite in veins in some lithics.
G3-1183.57	Lithic-poor top.
G3-1221.76	Upper unit. Calcite and green-clay alteration.
G3-1231.08	Upper unit. Vapor-phase crystallization. Green-clay alteration, clays in veins.
G3-1264.81	Upper unit. Groundmass almost uniformly granular with green-clay alteration patches common. Pumice, shards preferentially altered to clay. Large calcite alteration spots. Zeolite alteration.
G3-1292.50	Upper unit. Calcite alteration. More extensive clay alteration in groundmass.
G3-1307.10	Middle unit. Clay alteration of groundmass common. Clay alteration of pumice pervasive. Quartz vein filling.
G3-1337.50	Middle unit. Clay alteration of groundmass common. Calcite altered areas.
G3-1348.13	Middle unit. Clay alteration in groundmass. Zeolitic alteration.
G3-1352.76	Lower unit. Zeolitic alteration. Calcite vein filling and alteration. One enormous lithic biases count.
G3-1392.47	Lower unit. Green-clay alteration extensive. No sphene. Very altered.
G3-1429.18	Lower unit. Sericite on plagioclase. Rare calcite alteration. Common clay alteration. Pumice to clay. No sphene.
G3-1435.22	Lowermost unit. Lithic--granitic plutonic. Calcite alteration common. Clay alteration abundant. Some pyrite. No sphene.
G3-1449.84	Lowermost unit. Plagioclase glomerophenocrysts. Clay abundant in groundmass. Calcite common in groundmass. Many sheared phenocrysts. No sphene.

Appendix 1B--continued

Drill hole number,depth	Additional data
G3-1474.99	Lowermost unit. Pumice altered to clays. Pyrite disseminated in groundmass and pumice. Groundmass altered to clays. Calcite fairly abundant.
G3-1495.44	Older Tuffs. Clay and calcite alteration of groundmass. Pumice -> clay. No sphene.
G3-1528.36	Older Tuffs. Moderate clay alteration. Rare calcite.
G4-107	Potassium-feldspar resorption. Plagioclase altered. Pumice is devitrified. Iron oxides in matrix. Hornblende is oxidized.
G4-121.5	Feldspar shows resorption. Plagioclase could be xenocrysts.
G4-148.4	Glassy: mafics altered to opaques + hematite. Sericite alteration. Phenocrysts are small and very sparse.
G4-178.4	Opaques -> hematite. Plagioclase zoned and twinned. Argillic. Some of the crystals appear broken--small comminuted crystals in groundmass. Some plagioclase phenocrysts are mantled by potassium feldspar.
G4-220	Not an ash flow. Sericite alteration; some crystals are very resorbed, others are not. Biotite phenocrysts are kink-banded.
G4-231	Large zircons. Sericite alteration. Feldspar phenocrysts are deeply embayed.
G4-236.5	Hematite flakes in plagioclase phenocrysts. Sericite alteration.
G4-240.2	Tridymite-filled vesicles. Potassium feldspar occasionally mantles plagioclase.
G4-243.6	Potassium feldspar and quartz resorbed. Colloform textures of quartz(?) and potassium feldspar in vesicles. Potassium feldspar mantles plagioclase. Potassium feldspar(?)--and quartz(?)--filled microfractures criss-cross the thin section. Biotite is red, oxidized.
G4-253	Void spaces within pumice. Heavy iron-oxide staining. Some plagioclase phenocrysts have potassium-feldspar rims. Some crystals are highly resorbed, others are fresher.

Appendix 1B--continued

Drill hole number,depth	Additional data
G4-272.6A	Tridymite and potassium feldspar in vesicles. Potassium-feldpar rims on plagioclase phenocrysts. Shard texture totally obscured by devitrification. Sericite alteration. Some biotite has altered to white mica.
G4-272.6B	Zeolitic.
G4-280.8	Biotite -> sericite + hematite. Heavy iron-oxide staining. Potassium feldspar resorbed, mantles plagioclase. Tridymite in vesicles. Sericite alteration.
G4-307.6	Biotite -> sericite + magnetite + hematite. Tridymite and potassium feldspar vapor-phase minerals. Potassium feldspar occasionally mantles plagioclase. Clusters of opaques. Large zircons.
G4-383.3	Biotite -> sericite + magnetite + hematite. Tridymite and other vapor-phase minerals. Sericite alteration in matrix. Plagioclase-> calcite. Potassium feldspar mantles plagioclase. Clusters of opaques. Heavy iron-oxide staining in matrix.
G4-416.2	Biotite -> sericite + hematite. Tridymite in vesicles. Potassium feldspar mantles plagioclase; one sanidine phenocryst has a sodic rim. Sericite alteration. Abundant elliptical mineral-filled vesicles (25-30 percent of rock).
G4-446.7	Opaques are altering to iron oxides. Biotite -> sericite + iron oxides + opaques. Tridymite fills vesicles. Plagioclase is zoned with albite and carlsbad twinning. Potassium feldspar mantles plagioclase.
G4-500.9	Biotite -> sericite + magnetite + hematite. Tridymite fills vesicles. Centers of plagioclase phenocrysts corroded. Plagioclase -> calcite. Spherulitic devitrification. Abundant elliptical to rounded mineral-filled vesicles (20-25 percent of rock).
G4-625.7	Vesicles filled with tridymite, quartz, and occasionally potassium feldspar. Local areas of microcracking with iron oxides or possibly pyrolusite. Several quartz- and sericite(?)-filled microfractures up to 1.4 mm wide. Sericite alteration. Spherulitic devitrification. Opaques are present.

Appendix 1B--continued

Drill hole number, depth	Additional data
G4-694.8	Local iron-oxide stained microcracks. Voids in pumice filled with tridymite and potassium feldspar. Spherulitic devititrification.
G4-746.6	Biotite -> white mica + opaques + hematite. Tridymite in vesicles. Potassium feldspar mantles plagioclase, but there is one plagioclase grain that has a potassium feldspar core. Spherulitic devitrification.
G4-817.3	Biotite -> hematite + opaques. Vesicles are filled by tridymite, quartz, and potassium feldspar. Vapor-phase crystallization. Potassium feldspar mantles plagioclase. Lithics contain resorbed quartz phenocrysts.
G4-934.2	Quartz-filled microfracture traverses thin section. Tridymite- or quartz- or potassium feldspar-filled vesicles. Potassium feldspar mantles plagioclase. Clusters of opaques (pyrolusite?) around iron-oxide stained microcracks. There are several other mineral-filled microfractutres in the thin section paralleling the major quartz-filled microfracture.
G4-934.2	Count redone. Large potassium feldspar and quartz crystals in vesicles. Potassium feldspar has albite twinning as does plagioclase. The plagioclase has also taken on a pale yellow potassium stain. Extensive mineral-filled microfractures. Potassium feldspar mantles plagioclase.
G4-1026.0	Biotite -> sericite + opaques + hematite. Tridymite, quartz, and potassium feldspar in vesicles. Quartz-filled microfractures pinch out.
G4-1089.0	Minor, thin silica-filled microfractures. Zones of opaques and hematite flakes with iron-oxide filled microcracks. Tridymite, quartz, and potassium feldspar in vesicles. Potassium feldspar mantles plagioclase.
G4-1117.8	Silica-filled microfractures. Quartz- and potassium feldspar-filled vesicles; little tridymite. Potassium feldspar mantles plagioclase.

Appendix 1B--continued

Drill hole number, depth	Additional data
G4-1190.1	Quartz in matrix and microcracks that parallel compaction direction; these also cross phenocrysts. Tridymite- and potassium feldspar-filled vesicles. Myrmekitic intergrowth of potassium feldspar and quartz. Coarsely fibrous spherulitic devitrification.
G4-1244.3	Thin, silica-filled microfractures. Thin section incorporates a large lithic fragment. Local iron oxide-stained microcracks.
G4-1281.9	Thin, silica-filled microfractures. Iron oxide-stained microfractures. Opaques often have a radially microcrack system around them.
G4-1296.3	Sodic rim on potassium feldspar. Finely fibrous to spherulitic devitrification; shards are discernible. Potassium feldspar mantles plagioclase. Tridymite in vesicles. Quartz-filled(?) microfractures through matrix. Some sericite alteration.
G4-1330.7	Opaques are present--magnetite(?). Perlitic cracking; very fine, thin micofractures.
G4-1371.2	Perlitic cracking. Abundant hematite in glassy matrix.
G4-1382.7	Zeolitic(?).
G4-1390.2A	Glassy fragments and shards, zeolitic matrix, probably comminuted. Bad statistics.
G4-1390.2B	Pumice shows some flattening. Sericite alteration.
G4-1400.4A	Glassy but partially devitrified. Extensive open microfractures through thin section. Myrmekitic intergrowth.
G4-1400.4B	Solid glass fragments and shards = 86 points of total count; voids = 244 points. Argillic and zeolitic groundmass of shards and small pumice. Glass fragments appear plucked from cavities; therefore count is only approximated.
G4-1419.0	Tuffaceous Beds of Calico Hills. Perlitic cracks in large glass fragments.
G4-1431.8	Some plagioclase corroded--xenocrysts(?).

Appendix 1B--continued

Drill hole number, depth	Additional data
G4-1437.9	Some sericite alteration. Unit seems to have many broken crystals and comminuted grains in matrix.
G4-1472.2A	Sericite alteration. Some plagioclase grains are very corroded--xenocrysts(?). Many small comminuted grains in matrix.
G4-1472.2B	Pumice = 1920 points of total count; voids = 105 points; porous lithics = 149 points. Pumice appears (by birefringence) somewhat more argillic and zeolitic than interstitial shards and dust. Clinoptilolite growing in some cavities.
G4-1551.0	Some sericite alteration. One myrmekitic intergrowth of potassium feldspar and plagioclase phenocryst(?).
G4-1601.8	Quartz is resorbed.
G4-1685.0	Zeolitic(?). There is a lot of fine, comminuted material between the pumice and lithics--this may be due to the proximity of the fault.
G4-1761.8	Biotite -> chlorite + sericite + magnetite. Potassium feldspar and quartz resorbed. Sphene -> calcite. Ragged stringers of opaques occur between the shards--could be altered biotite.
G4-1779.6	Biotite -> chlorite + sericite + hematite. Sericite alteration. Pyroxene -> sericite + chlorite + hematite. Potassium feldspar often mantles plagioclase.
G4-1817.8	Sericite alteration.
G4-1871.6	Sericite alteration. Potassium feldspar mantles plagioclase.
G4-1938.8	Sericite + chlorite alteration in pseudomorphs. Potassium feldspar occasionally mantles plagioclase. Lithics and pseudomorphs have iron-oxide aureoles.
G4-1989.4	Potassium feldspar and quartz resorbed. Occasional sodic rims on potassium feldspar. Red, needle-like alteration mineral (smectite?) scattered through rock.

Appendix 1B--continued

Drill hole number, depth	Additional data
G4-2039.0	Zeolitic(?). A lot of comminuted grain material between the pumice. Most mafics are oxidized. Potassium feldspar occasionally has sodic rims.
G4-2069.0A	Zeolitic. Voids = 33 points of total count.
G4-2069.0B	Potassium feldspar and quartz resorbed. A few resorbed plagioclase xenocrysts(?).
G4-2089.9	Potassium feldspar and quartz resorbed. Sericite alteration. Occasional plagioclase cores within potassium feldspar. Many plagioclase phenocrysts have sodic rims.
G4-2131.5	Vapor-phase crystallization; potassium feldspar and tridymite in vesicles. Potassium feldspar and quartz resorbed. Potassium feldspar mantles plagioclase.
G4-2202.3	Biotite -> sericite + hematite. Potassium feldspar and quartz resorbed. Sericite alteration.
G4-2226.7A	Potassium feldspar and quartz resorbed. Sericite alteration.
G4-2226.7B	Black opaque matter in pumice, (may be artificial--ink), 84 points of total count; shards = 2678 points; cellular pumice = 2046 points; voids = 119 points. Zeolite alteration mostly in shards. Pumice is mostly argillic. Quartz is wormy.
G4-2263.8	Sericite alteration. Occasional calcite in plagioclase. Plagioclase is twinned, some have corroded centers. Finely fibrous devitrification in pumice to coarse devitrification in matrix. Abundant hematite flakes in matrix.
G4-2285.3	Sericite alteration. Some calcite alteration of plagioclase--centers of plagioclase phenocrysts corroded.
G4-2354.9A	Biotite -> magnetite + hematite + sericite. Two stages of biotite--one is very altered--some totally replaced to a pseudomorph stage --other is fresher, oxidized. Sericite alteration.
G4-2354.9B	Wormy quartz. Pumice has flattening ratio > 5:1.

Appendix 1B--continued

Drill hole number, depth	Additional data
G4-2381.9	Potassium feldspar occasionally mantles plagioclase.
G4-2423.3	Potassium feldspar and quartz resorbed. Coarse granophyric devtrification.
G4-2516.8	Coarse granophyric devitrification. Potassium feldspar and quartz devitrification products. Quartz resorbed. Sericite alteration. Phenocrysts have authigenic overgrowths. Potassium feldspar mantles plagioclase.
G4-2533.8	Biotite -> magnetite. + hematite. Sericite alteration. Many plagioclase phenocrysts have corroded centers. Hornblende -> magnetite + hematite + sericite.
G4-2551.6	Flattened pumice. Centers of plagioclase phenocrysts corroded. Coarsely devitrified groundmass. Sericite alteration.
G4-2598.8	Centers of plagioclase phenocrysts are corroded. Calcite alteration, replacing plagioclase. Finely fibrous to spherulitic devitrification.
G4-2665.8	Minor calcite alteration in plagioclase.
G4-2716.8	Hematite flakes in plagioclase phenocrysts. Biotite flakes are kink-banded. Quartz and potassium feldspar resorbed. Potassium feldspar occasionaly mantles plagioclase. Biotite xenolith(?); graphic intergrowth with plagioclase. Some calcite(?) alteration of shards. Pyroxene -> chlorite(?) + sericite. Colloform textures within shards and vesicles.
G4-2731.5	Abundant hematite flakes. Sericite alteration.
G4-2762.6	Ash fall. Biotite flakes have a subparallel orientation--could indicate reworking. Minor calcite alteration. Many small comminuted crystals in matrix. Centers of plagioclase crystals corroded.
G4-2788.3	Some plagioclase centers are corroded.
G4-2825.0	Potassium feldspar and quartz resorbed. Plagioclase grains are very corroded and cracked.

Appendix 1B--continued

Drill hole number, depth	Additional data
G4-2840.4	Abundant hematite flakes in groundmass. Finely fibrous spherulitic devitrification in pumice. Shard outline in matrix obscured by coarser devitrification.
G4-2875.6A	Quartz and potassium feldspar resorbed. Sericite alteration. Biotite -> opaques.
G4-2875.6B	Spherulitic pumice = 446 points of total count; intermediate lava = 102 points; rhyolitic tuff = 173 points.
G4-2964.3	Quartz and potassium feldspar resorbed.
G4-3000.9	Biotite -> opaques + hematite. Sericite alteration. Spherulitic devitrification in pumice.
B1H-2371	Thin section not stained. Quartz and potassium feldspar resorbed and embayed. Potassium feldspar mantles plagioclase. Some clay(?); iron-oxide alteration.
B1H-2443	Thin section not stained. Microfault with gouge throughout the thin section. Plagioclase corroded and altered. Lithics are iron-oxide stained. Glomerocrysts of plagioclase.
B1H-2465.3	Thin section not stained. Coarse devitrification minerals destroy shard structure. Calcite alteration, especially within plagioclase. Potassium feldspar and quartz resorbed. Plagioclase corroded and altered. Potassium feldspar mantles plagioclase.
B1H-2566.4	Thin section not stained. Coarse devitrification minerals obscure shard texture. Calcite alteration. Apatites have a brownish tint in plane light. Glomerophenocrysts of plagioclase and biotite. Phenocrysts with overgrowths. Potassium feldspar and quartz resorbed. Plagioclase corroded and altered, especially by calcite.
B1H-2731	Thin section not stained. Shards are altered to clay minerals. Potassium feldspar mantles plagioclase. Lithics altered to opaques and iron oxides.
B1H-2816	Some calcite alteration. Zeolites(?).

Appendix 1B--continued

Drill hole number,depth	Additional data
B1H-2916.2	Potassium feldspar mantles plagioclase. Quartz resorbed. Some plagioclase centers corroded and altered.
B1H-3027.1	Calcite alteration, especially after plagioclase.
B1H-3181.8	Microfault with gouge throughout thin section. Phenocrysts are embayed due to resorption. No sphene.
B1H-3198	Calcite alteration. Spheroidal devitrification.
B1H-3211	Shards altered to clay. Calcite alteration and calcite-filled microfractures.
B1H-3277.7	Minor spherulitic devitrification. Zeolites common; clinoptilolite and (or) mordenite.
B1H-3293.6	Microfaults with gouge material. Opal(?) and (or) chalcedony in vesicles. Phenocrysts are embayed.
B1H-3296.5	Zeolitic. Chalcedonic ash-flow tuff. Groundmass altered to chalcedony and clinptilolite/mordenite. Quartz slightly resorbed.
B1H-3519.4	Argillized, calcitized. Microfractures filled with calcite. Quartz slightly resorbed.
B1H-3999	Pumice argillized. Quartz slightly resorbed.
C1-1315.0	Zeolites replaced shards.
C1-1327.3	Zeolites replaced shards.
C1-1522.3	Shard texture obscured. Zeolites replaced shards. A lot of comminuted crystal material in matrix. Shard outlines destroyed by coarse devitrification. Plagioclase phenocrysts appear totally altered and replaced; plagioclase count probably too low.
C1-1702.5	Shard outlines are destroyed. Plagioclase phenocrysts appear to have been totally altered and replaced. Plagioclase count is probably too low.
C1-1878.2	Biotite -> opaques + iron oxide. Pyroxene -> opaques + iron oxide. Phenocrysts resorbed.

Appendix 1B--continued

Drill hole number, depth	Additional data
C1-2067.1	Zeolites(?). Calcite alteration. Biotite -> opaques + iron oxides.
C1-2159.5	Minor calcite alteration. Potassium feldspar occasionally mantles plagioclase.
C1-2347.9	Plagioclase -> calcite. Calcite alteration in matrix also. Heavy iron-oxide staining. Sphene -> opaques + micaceous minerals. Hornblende -> opaques + micaceous minerals. Hornblende -> opaque + mica.
C1-2607.2	Extensive calcite alteration in pumice/matrix. Zeolites(?).
C1-2785.4	Potassium feldspar mantles plagioclase. Calcite replacing plagioclase in lithics. Comminuted material in matrix--cannot see shard structure.
C1-2992.9	Calcite-lined microfractures. Calcite alteration. Zeolite replacement. Potassium feldspar mantles plagioclase.
C2-1344.6	Zeolite replacement of glass. Biotite -> hematite + leucoxene(?). Amorphous(?) silica fills vesicles or replaces shards.
C2-1626.3	Reworked tuff. Glass components difficult to separate from some matrix material. Glass components = 625 points of total count.
C2-1633.9	Tuffaceous sandstone. Zeolitic alteration of glass fragments. Glass fragments = 1406 points of total count.
C2-1635.8	Zeolite replacement of glass. Clay alteration. Pumice rich. Plagioclase corroded--may be xenocrysts.
C2-1642.8	Reworked tuff. Biotite flakes are bent around lithics.
C2-1745.9	Coarse devitrification obscures shard texture. Calcite replaces plagioclase. Plagioclase grains very altered and corroded. Quartz and potassium feldspar resorbed. Biotite -> hematite + opaques.
C2-1819.4	Heavy iron-oxide staining, especially around pumice. Quartz and potassium feldspar resorbed. Plagioclase corroded.

Appendix 1B--continued

Drill hole number, depth	Additional data
C2-2097	Zeolites replaced shards. Lithics altered to hematite + opaques. Biotite -> hematite + opaques + plagioclase.
C2-2103.1	Lithic fragments altered to opaques. Zeolites replaced shards.
C2-2110.0	Zeolite and clay alteration of shards. Delicate shard structure preserved. Faintly laminated; fluvial reworking(?) or surge(?).
C2-2278.7	Coarsely devitrified. Calcite replacing plagioclase. Hornblende replaced by calcite, opaques, and white mica. Quartz resorbed.
C2-2477.9	Quartz resorbed. Plagioclase centers corroded. Potassium feldspar somewhat resorbed. Potassium feldspar and plagioclase zoned. Biotite oxidized and rimmed with opaques. Hornblende altered to opaques and micas. Vapor-phase crystallization. Quartz high for Bullfrog.
C2-2683.6	Heavy iron-oxide and (or) clay rims around the particles. Unit is distinguished by micrographic intergrowth fragments of plagioclase and quartz.
C2-2747.5	Calcite alteration of plagioclase. Hematite(?) in matrix. Quartz and potassium feldspar resorbed.
C2-2788.8	Microfractures filled with iron oxides. Pumice-rich with iron-oxide rims. Broken phenocrysts. Coarse devitrification products obscure shard texture.
H3-1840	Zeolite replaced shards.
H3-1930	Count from bit cuttings. Zeolites replaced shards. Some plagioclase crystals contain mafic inclusions. Iron-oxide stained microcracks in phenocrysts.
H3-1980	Two phases of biotite--one very pleochroic red and oxidized--the other "normal" birefringence.
H3-2060	Clay minerals have replaced shards. Lithics are lava fragments with plagioclase laths and opaques.

Appendix 1B--continued

Drill hole number,depth	Additional data
H3-2230	Count from bit cuttings. Spherulitic devitrification. Potassium feldspar mantles plagioclase. Lithics have silica and iron-oxide-filled microfractures.
H3-2300	Count from bit cuttings. Silica-filled and iron-oxide-lined microcracks. Potassium feldspar mantles plagioclase.
H3-2360	Potassium feldspar mantles plagioclase.
H3-3460	Thin section not stained. Count from bit cuttings. Zeolite replacing glass shards. Iron oxide, clay(?) alteration in matrix. Clay alteration rims around lithics and pumice.
H3-3475	Thin section not stained. Count from bit cuttings. Zeolites replaced glass shards. Clay with iron-oxide alteration rims around lithics and pumice.
H3-3560	Zeolites replaced shards. Pyrite in lithics. Calcite alteration.
H3-3575	Count from bit cuttings. Zeolites replacing shards. Calcite alteration. Pyrite in lithics. Some opal replaced quartz.
H3-3660	Count from bit cuttings. Calcite Alteration. Zeolitic(?).
H4-1312	Thin section not well stained. Clay alteration rims around tuff lithics. Calcite alteration. Zeolitic.
H4-1420	Zeolites in voids and replacing shards. Open microfractures. Minor calcite alteration. Clay alteration halos around lithics. A lot of comminuted phenocryst material in matrix.
H4-1455	Biotite -> magnetite. Discontinous open microfractures. Zeolitic(?). Individual shards in matrix are indistinct.
H4-1550	Thin section not well stained. Clay alteration rims around plagioclase and lithics. Zeolitic(?). Cannot see individual crystals, but chip has waxy appearance.
H4-1656	Chlorite alteration of mafics and lithics. Minor calcite in voids (a great deal of void space). Vapor-phase crystallization in pumice.

Appendix 1B--continued

Drill hole number,depth	Additional data
H4-1665	Coarse devitrification products have destroyed shard structures. Chlorite(?) alteration of mafics. Some plagioclase appears to be corroded xenocrysts.
H4-1720	Authigenic potassium feldspar overgrowth on feldspars. Potassium feldspar mantles plagioclase. Chlorite alteration of biotite(?) or another mafic. Potassium feldspar mantles plagioclase. Shard outlines destroyed by devitrification products.
H4-1735	Count made from fragments. Occasional iron oxide-stained microfractures in phenocrysts. Clusters of opaques--manganese oxides(?). Potassium feldspar mantles plagioclase. NOTE: high phenocryst count compared to log. Shard outlines destroyed by devitrification products.
H4-1785	Count from two fragments. Vapor-phase crystallization in pumice. Devitrification has destroyed shard outlines. Clay rims around pumice. A few iron-oxide-stained microfractures. NOTE: very high phenocryst count compared to log.
H4-1805	Count made from fragments. Iron-oxide-stained microfractures. Vapor-phase crystallization in pumice.
H4-2060	Count made from fragments. Sodic(?) rims on potassium feldspar. Zeolitic. Abundant small flakes of red-oxide mineral in matrix.
H4-2250	Count made from fragments. Zeolitic with clay alteration on rims of shards.
H4-2430	Potassium feldspar mantles well developed, euhedral plagioclase phenocrysts. Large zircons (0.14 mm) and apatites (0.15 mm).
H4-2520	Count made from small fragments. Clay alteration. Lithics are iron oxide-stained ash-flow tuff fragments. Phenocrysts are resorbed. Possibly some zeolite(?) replacement of shards.
H5-1667	Smectite(?) alteration. A few opaque and iron oxide-lined microfractures.
H5-1800	Glassy matrix; some clay alteration.

Appendix 1B--continued

Drill hole number,depth	Additional data
H5-1852	Count made from fragments. Glassy matrix altered to clay mineral--smectite(?).
H5-1917	Banded ash-flow tuff and glass fragments. Thin section grades from clusters of coarse pumice and coarse-grained phenocrysts to fine layers of shards, phenocrysts, lithics, and pumice. Zeolites in pumice and pore spaces. Glassy matrix is devitrified.
H5-1960	Count made from fragments. Clay alteration around lithics.
H5-1966	Large zircons up to 0.28 mm. Glass lithics with perlitic cracks. Phenocrysts are resorbed. Some plagioclase grains may be xenocrysts.
H5-2020	No description.
H5-2660	Count made from small fragments. Shards larger in one fragment--very small in another. Two of the fragments are zeolitic.
H5-2690	Potassium feldspar and quartz resorbed. Biotite -> hematite + opaques. Shards are partially altered to clay minerals. Potassium feldspar mantles plagioclase. Lava lithics consist of plagioclase and biotite laths.
H5-2710	Hematite rims around pumice. Clay alteration. Potassium feldspar mantles plagioclase. Potassium feldspar and quartz resorbed. Zeolitic(?).
H5-2800	Count made from large fragment. Large zircon up to 0.2 mm. Potassium feldspar and quartz resorbed.
H5-3520	Dacite lava. Relict perlitic cracking. Zeolitic. Large zircons, up to 0.15 mm. Glomerocrysts of mafics--hornblende and biotite. Some hematite alteration along microfractures.
H5-3620	Dacite lava. Count made from fragments. Vitric, perlitic cracking in glassy matrix. Clay alteration--smectite(?) along cracks. Hornblende fresher than in H5-3960. Minor calcite alteration, especially in plagioclase. Sericite alteration along perlitic cracks.

Appendix 1B--continued

Drill hole number, depth	Additional data
H5-3960	Dacite lava. Count made from fragments. Zircons up to 0.15 mm. Minor calcite alteration. Parallel sets of microfractures filled with alteration products. Zeolitic. Hornblende is very altered to opaques and micaceous minerals.
H6-1165	Spherulitic. Parallel sets of silica-filled microfractures cross the thin section. Quartz- and tridymite(?)-filled vesicles.
H6-1380.6	Broken, comminuted phenocrysts in matrix. Pumice is abundant.
H6-1426.3	Potassium feldspar occasionally mantles plagioclase. Pumice abundant.
H6-1510.1	Many small broken phenocrysts in glassy matrix.
H6-1517.3	Collapsed pumice. Quartz and potassium feldspar resorbed.
H6-1672.3	Siltstone contains zircons. Potassium feldspar and quartz resorbed. Matrix has minute biotite(?) or leucite(?) flakes. Broken phenocrysts in matrix.
H6-1838.2	Biotite -> opaques + white mica. Hornblende -> opaques + white mica. Authigenic rims around feldspars. Lava lithic with plagioclase laths in matrix. Vapor-phase crystallization.
H6-1920	Count from rock fragments. Calcite alteration of plagioclase. Zircons up to 0.14 mm. Hornblende replaced by white mica, opaques, and hematite. Quartz resorbed.
H6-1950	Count made from fragments. Potassium feldspar mantles plagioclase. Biotite -> magnetite + hematite. Phenocrysts are resorbed. Hornblende is replaced by opaques, hematite, and white mica.
H6-2051.4	Zircons up to 0.16 mm. Phenocrysts, especially quartz, resorbed.
H6-2130	Count made from fragments. Zircons up to 0.14 mm. Biotite is oxidized. Potassium feldspar occasionally mantles plagioclase.

Appendix 1B--continued

Drill hole number,depth	Additional data
H6-2160	Count made from fragments. Zeolitic(?). Phenocryst count is very high compared to log.
H6-2354.4	Vapor-phase crystallization in pumice. Potassium feldspar and plagioclase are zoned, show signs of resorption. Quartz is resorbed. Potassium feldspar mantles plagioclase. No sphene.
H6-2362	Potassium feldspar and quartz resorbed. No sphene. Vapor-phase crystallization in pumice.
H6-2866	Zeolitic. Sericitic(?)--micaceous alteration in matrix. Quartz and potassium feldspar resorbed. Opaques -> hematite. No sphene observed.
H6-3003	Dacite lava. Hornblende is not totally replaced as it is deeper in the hole. Low birefringent mineral in cavities and matrix are zeolites. The zeolites have stained yellow due to high potassium content. Apatite crystals up to 0.14 mm. Clay minerals--smectite(?). Opaques -> hematite. Biotite flakes oriented along plagioclase zones.
H6-3080	Dacite lava. Calcite alteration. Microlites in matrix. Microfractures common. Apatite crystals up to 0.14 mm. Hornblende replaced by iron oxide and silica. Biotite -> opaques.
H6-3191.4	Dacite lava. Calcite alteration. Plagioclase laths in matrix. Iron oxide-stained microfractures. Lithics finer grained than host rock, but same mineralogy.
H6-3360	Dacite lava. Count made from fragments. Perlitic cracking in glassy matrix. Hornblende and biotite oxidized--red pleochroism. Silica-filled microfractures. Phenocrysts very broken up.
H6-3402.8	Dacite lava. Calcite pseudomorphs after hornblende with rims of opaques and iron oxides. Hematite alteration. Silica-filled, fine microfractures. Plagioclase resorbed.

Appendix 1B--continued

Drill hole number, depth	Additional data
H6-3550	Dacite lava. Calcite alteration. Sericite alteration in mafics. Calcite- and silica-filled microfractures. Plagioclase microlites in matrix. Hematite alteration; iron oxide-lined microfractutes. Quartz very resorbed.
H6-3605.7	Dacite lava. Perlitic cracks in matrix. Fluid inclusions in plagioclase; zones outlined by glassy blebs. All minerals show a degree of resorption. Narrow fracture zones of crushed material. Biotite, hornblende, and plagioclase contain mineral inclusions. Plagioclase is strongly zoned with carlsbad and albite twinning.
H6-4001.9	Sericite alteration and some calcite in plagioclase. Vitric.
J13-1883	Vapor-phase crystalization in pumice.
J13-2011	No quartz.
J13-2132	No description.
J13-2183	No description.
J13-2382.5	Quartz not wormy. Porous, argillized.
J13-2532.1	No description.
J13-2684	No description.
J13-2685.2	No description.
J13-2843	No description.
J13-2998	Lithic rich.
J13-3005	Quartz slightly resorbed. Argillized. Lithic rich.
J13-3030	Argillized, calcitized.
J13-3110	Argillized, calcitized.
J13-3150	Argillized, calcitized.
J13-3190	Argillized, calcitized. Few, slightly flattened pumice.
J13-3200	Argillized, calcitized.

Appendix 1B--continued

Drill hole number,depth	Additional data
J13-3246	Slightly welded (compacted) greenish altered tuff; calcite in groundmass and chlorite mineral.
J13-3290	Argillized and calcitized.
J13-3450	Quartz slightly resorbed. Calcitized and argillized.
WT1-1682.4	Potassium feldspar mantles plagioclase. Potassium feldspar and quartz resorbed. Clusters of iron oxide-lined microcracks.
WT2-2054	Rutile(?) needles in plagioclase. Sphene rimmed with opaques. Large zircons (0.3 mm) and sphene (0.4 mm).
WT2-2055.6	Possibly one small sphene pseudomorph(?). Some mafic pseudomorphs are hornblende.
WT3-1140.0	Calcite alteration in plagioclase. Potassium feldspar occasionally mantles plagioclase. Hornblende replaced by iron oxide and calcite. Quartz-filled microfractures traverse matrix and phenocrysts. Lithics stained with iron oxide. Abundant quartz up to 2 mm in length in this section.
WT4-1571.3	Zeolitic. Centers of plagioclase crystals dissolved out. Pumice altered to birefringent clays.
WT6-320-330	Perlitic cracks in glassy material.
WT6-390-400	Ash flow; contains glassy rhyolitic lava fragments. Lava fragments small, some unwelded. Potassium feldspar resorbed. K-stain did not take.
WT6-650-660	Rhyolitic Lava. Perlitic cracking--glassy matrix with oxidized filling. Spherulitic devitrification. Fragments of banded devitrification layers between perlitic glassy layers. Zeolitic(?). Quartz resorbed.
WT6-870-880	Rhyolitic Lava. Filled perlitic cracks in matrix. Quartz resorbed. Plagioclase twinned. Staining did not take.
WT6-1251.1	Rhyolitic Lava. Potassium feldspar mantles plagioclase. Potassium feldspar did not stain.

Appendix 1B--continued

Drill hole number,depth	Additional data
WT6-1255.1	Rhyolitic Lava(?). Zeolitic(?). Potassium feldspar rims plagioclase. Quartz and plagioclase resorbed. Stain did not take.
WT7-1604.8	Shard structure obscured by coarse devitrification. Calcite alteration. Zeolitic(?). Vapor-phase crystallization in pumice.
WT11-1442.8	Shard structure obscured. Glomerocrysts with perlitic cracks. Microfractures with alteration halos. Zeolitic.
WT12-1302.2	Zeolites replaced shards. Lithics with iron-oxide stain. Glomerocrysts with inclusions. Opaque flecks--pyrolusite(?).
WT13-1151	Extensive quartz-filled microfractures with hematite flakes. Plagioclase twinned and zoned. Quartz in voids. Iron oxide in matrix and clays. Potassium feldspar mantles plagioclase in two grains.
WT14-1309.8	Zeolite replacment. Shard texture obscured--abundant pumice.
WT15-1355	Spherulites. Silica-filled microfractures. Heavy iron-oxide(?) stain or clay alteration. Potassium feldspar mantles plagioclase (1 grain of plagioclase rimming potassium feldspar).
WT15-1356.1	Silica-filled microfractures. Quartz-filled vesicles. Iron oxide-stained microcracks.
WT16-1090	More lava than tuff. Perlitic cracks with clay alteration. Zeolitic.
WT16-1210	Count from fragments. Zeolites replaced glass. Clay alteration. Perlitic cracking.
WT16-1290	Dense, perlitic cracking with clay alteration. Zeolite replacment. Hematite flakes in matrix. Zones of oriented microlites.
WT16-1704	Perlitic cracking with alteration. Zeolite replacement of glass. Minor chalcedony in voids. Iron oxide or clay alteration; iron-oxide- and opaque-lined microfractures.

Appendix 1B--continued

Drill hole number, depth	Additional data
WT16-1708.4	Zeolite replacement of glass. Remanent perlitic cracking. Microfractures--some lined with alteration minerals.
WT17-810	Count from bit cuttings. Silica in vesicles. Opaque and iron-oxide-filled microcracks--1 silica-filled fracture.
WT17-1100	Count from bit cuttings. Clay alteration within pumice; lithic and pumice rich. Quartz resorbed.
WT17-1350	Count from fragments. Coarse devitrification obscured shard texture. Lithics very fine grained; iron-oxide stained.
WT18-2037.4	Adularia rhombs in voids. Zeolitic. Pumice altered to birefringent clays.

APPENDIX 1C

Locations of Yucca Mountain drill hole sample modes

Appendix 1C

Drill hole number,depth	Drill hole name
G1-1561.8	USW G-1
G1-1689.5	USW G-1
G1-1811.7	USW G-1
G1-1943.4	USW G-1
G1-2009.8	USW G-1
G1-2124.7	USW G-1
G1-2231.0	USW G-1
G1-2246.0	USW G-1
G1-2300.4	USW G-1
G1-2354.6	USW G-1
G1-2397	USW G-1
G1-2461.5	USW G-1
G1-2470.6	USW G-1
G1-2478.3	USW G-1
G1-2507	USW G-1
G1-2555	USW G-1
G1-2594.2	USW G-1
G1-2678.0	USW G-1
G1-2772.6	USW G-1
G1-2851.7	USW G-1
G1-2868	USW G-1
G1-2931.4	USW G-1
G1-3013.9	USW G-1
G1-3192.8	USW G-1

Appendix 1C--continued

Drill hole number, depth	Drill hole name
G1-3196	USW G-1
G1-3284.5	USW G-1
G1-3515.1	USW G-1
G1-3724.0	USW G-1
G1-3908.2	USW G-1
G1-3969	USW G-1
G1-3992	USW G-1
G1-4150.4	USW G-1
G1-4222.1	USW G-1
G1-4408	USW G-1
G1-4471	USW G-1
G1-4578.2	USW G-1
G1-4758.4	USW G-1
G1-4849.0	USW G-1
G1-4917.0	USW G-1
G1-4946.4	USW G-1
G1-4969.0	USW G-1
G1-5002.3	USW G-1
G1-5045.0	USW G-1
G1-5097.9	USW G-1
G1-5115.5	USW G-1
G1-5141.5	USW G-1
G1-5142.2	USW G-1
G1-5187.0	USW G-1
G1-5265.6	USW G-1
G1-5316.0	USW G-1
G1-5322.0	USW G-1

Appendix 1C--continued

Drill hole number,depth	Drill hole name
G1-5358.5	USW G-1
G1-5373.7	USW G-1
G1-5400.0	USW G-1
G1-5416.6	USW G-1
G1-5438.2	USW G-1
G1-5454.1	USW G-1
G1-5496.1	USW G-1
G1-5517.3	USW G-1
G1-5540.0	USW G-1
G1-5558.7	USW G-1
G1-5600.0	USW G-1
G1-5642.0	USW G-1
G1-5728.0	USW G-1
G1-5841.0	USW G-1
G1-5894.3	USW G-1
G1-5929.8	USW G-1
G1-5944.9	USW G-1
G1-5980.0	USW G-1
G1-5984.7	USW G-1
G2-769	USW G-2
G2-880	USW G-2
G2-1149	USW G-2
G2-1347.5	USW G-2
G2-1517.2	USW G-2
G2-1606.5	USW G-2
G2-1770	USW G-2
G2-1863.0	USW G-2

Appendix 1C--continued

Drill hole number, depth	Drill hole name
G2-2075.0	USW G-2
G2-2173	USW G-2
G2-2261	USW G-2
G2-2328	USW G-2
G2-2358	USW G-2
G2-2499.7	USW G-2
G2-2504	USW G-2
G2-2551	USW G-2
G2-2602.8	USW G-2
G2-2650	USW G-2
G2-2708	USW G-2
G2-2755.0	USW G-2
G2-2928.7	USW G-2
G2-3042	USW G-2
G2-3064	USW G-2
G2-3108.1	USW G-2
G2-3122.2	USW G-2
G2-3143.5	USW G-2
G2-3159.4	USW G-2
G2-3216.7	USW G-2
G2-3244.3	USW G-2
G2-3271	USW G-2
G2-3285	USW G-2
G2-3292.5	USW G-2
G2-3294.0	USW G-2
G2-3313.0	USW G-2
G2-3326.0	USW G-2

Appendix 1C--continued

Drill hole number,depth	Drill hole name
G2-3350.9	USW G-2
G2-3362.1	USW G-2
G2-3433.9	USW G-2
G2-3475	USW G-2
G2-3583.0	USW G-2
G2-3601	USW G-2
G2-3626	USW G-2
G2-3730.5	USW G-2
G2-3787.3	USW G-2
G2-3834	USW G-2
G2-3872.6	USW G-2
G2-3907.0	USW G-2
G2-4078	USW G-2
G2-4134.2	USW G-2
G2-4170.5	USW G-2
G2-4185.4	USW G-2
G2-4200.2	USW G-2
G2-4239.4	USW G-2
G2-4348.8	USW G-2
G2-4445.9	USW G-2
G2-4568.0	USW G-2
G2-4667.5	USW G-2
G2-4770.3	USW G-2
G2-4838	USW G-2
G2-4841.2	USW G-2
G2-5002.4	USW G-2
G2-5109.7	USW G-2

Appendix 1C--continued

Drill hole number,depth	Drill hole name
G2-5195	USW G-2
G2-5210.5	USW G-2
G2-5230.0	USW G-2
G2-5318.8	USW G-2
G2-5403.0	USW G-2
G2-5490.0	USW G-2
G2-5591.2	USW G-2
G2-5661.0	USW G-2
G2-5663.4	USW G-2
G2-5670.2	USW G-2
G2-5690.6	USW G-2
G2-5783.0	USW G-2
G2-5923.2	USW G-2
G2-5945.8	USW G-2
G2-5986.9	USW G-2
G2-6005.6	USW G-2
GU3-11.66	USW GU-3
GU3-13.90	USW GU-3
GU3-23.89	USW GU-3
GU3-74.90	USW GU-3
GU3-92.56	USW GU-3
GU3-104.04	USW GU-3
GU3-108.59	USW GU-3
GU3-129.33	USW GU-3
GU3-131.27	USW GU-3
GU3-141.58	USW GU-3
GU3-160.23	USW GU-3

Appendix 1C--continued

Drill hole number,depth	Drill hole name
GU3-193.03	USW GU-3
GU3-234.42	USW GU-3
GU3-291.04	USW GU-3
GU3-344.52	USW GU-3
GU3-373.94	USW GU-3
GU3-397.00	USW GU-3
GU3-419.6	USW GU-3
GU3-430.69	USW GU-3
GU3-438.75	USW GU-3
GU3-456.68	USW GU-3
GU3-479.02	USW GU-3
GU3-487.33	USW GU-3
GU3-488.62	USW GU-3
GU3-531.54	USW GU-3
GU3-571.12	USW GU-3
GU3-605.40	USW GU-3
GU3-615.33	USW GU-3
GU3-631.04	USW GU-3
GU3-651.78	USW GU-3
GU3-664.85	USW GU-3
GU3-722.22	USW GU-3
GU3-752.00	USW GU-3
GU3-785.61	USW GU-3
G3-800.77	USW G-3
G3-809.75	USW G-3
G3-822.60	USW G-3
G3-829.94	USW G-3

Appendix 1C--continued

Drill hole number, depth	Drill hole name
G3-853.88	USW G-3
G3-873.82	USW G-3
G3-888.33	USW G-3
G3-928.22	USW G-3
G3-936.38	USW G-3
G3-948.90	USW G-3
G3-964.47	USW G-3
G3-983.28	USW G-3
G3-1019.14	USW G-3
G3-1049.00	USW G-3
G3-1059.30	USW G-3
G3-1122.49	USW G-3
G3-1137	USW G-3
G3-1145.74	USW G-3
G3-1183.57	USW G-3
G3-1221.76	USW G-3
G3-1231.08	USW G-3
G3-1264.81	USW G-3
G3-1292.50	USW G-3
G3-1307.10	USW G-3
G3-1337.50	USW G-3
G3-1348.13	USW G-3
G3-1352.76	USW G-3
G3-1392.47	USW G-3
G3-1429.18	USW G-3
G3-1435.22	USW G-3
G3-1449.84	USW G-3

Appendix 1C--continued

Drill hole number, depth	Drill hole name
G3-1474.99	USW G-3
G3-1495.44	USW G-3
G3-1528.36	USW G-3
G4-107	USW G-4
G4-121.5	USW G-4
G4-148.4	USW G-4
G4-178.4	USW G-4
G4-220	USW G-4
G4-231	USW G-4
G4-236.5	USW G-4
G4-240.2	USW G-4
G4-243.6	USW G-4
G4-253	USW G-4
G4-272.6A	USW G-4
G4-272.6B	USW G-4
G4-280.8	USW G-4
G4-307.6	USW G-4
G4-383.3	USW G-4
G4-416.2	USW G-4
G4-446.7	USW G-4
G4-500.9	USW G-4
G4-625.7	USW G-4
G4-694.8	USW G-4
G4-746.6	USW G-4
G4-817.3	USW G-4
G4-934.2A	USW G-4
G4-934.2B	USW G-4

Appendix 1C--continued

Drill hole number,depth	Drill hole name
G4-1026.0	USW G-4
G4-1089.0	USW G-4
G4-1117.8	USW G-4
G4-1190.1	USW G-4
G4-1244.3	USW G-4
G4-1281.9	USW G-4
G4-1296.3	USW G-4
G4-1330.7	USW G-4
G4-1371.2	USW G-4
G4-1382.7	USW G-4
G4-1390.2A	USW G-4
G4-1390.2B	USW G-4
G4-1400.4A	USW G-4
G4-1400.4B	USW G-4
G4-1419.0	USW G-4
G4-1431.8	USW G-4
G4-1437.9	USW G-4
G4-1472.2A	USW G-4
G4-1472.2B	USW G-4
G4-1551.0	USW G-4
G4-1601.8	USW G-4
G4-1685.0	USW G-4
G4-1761.8	USW G-4
G4-1779.6	USW G-4
G4-1817.8	USW G-4
G4-1871.6	USW G-4
G4-1938.8	USW G-4

Appendix 1C--continued

Drill hole number,depth	Drill hole name
G4-1989.4	USW G-4
G4-2039.0	USW G-4
G4-2069.0	USW G-4
G4-2069.0	USW G-4
G4-2089.9	USW G-4
G4-2131.5	USW G-4
G4-2202.3	USW G-4
G4-2226.7A	USW G-4
G4-2226.7B	USW G-4
G4-2263.8	USW G-4
G4-2285.3	USW G-4
G4-2354.9A	USW G-4
G4-2354.9B	USW G-4
G4-2381.9	USW G-4
G4-2423.3	USW G-4
G4-2516.8	USW G-4
G4-2533.8	USW G-4
G4-2551.6	USW G-4
G4-2598.8	USW G-4
G4-2665.8	USW G-4
G4-2716.8	USW G-4
G4-2731.5	USW G-4
G4-2762.6	USW G-4
G4-2788.3	USW G-4
G4-2825.0	USW G-4
G4-2840.4	USW G-4
G4-2875.6A	USW G-4

Appendix 1C--continued

Drill hole number, depth	Drill hole name
G4-2875.6B	USW G-4
G4-2964.3	USW-G-4
G4-3000.9	USW G-4
B1H-2371	UE25b1-H
B1H-2443	UE25b1-H
B1H-2465.3	UE25b1-H
B1H-2566.4	UE25b1-H
B1H-2731	UE25b1-H
B1H-2816	UE25b1-H
B1H-2916.2	UE25b1-H
B1H-3027.1	UE25b1-H
B1H-3181.8	UE25b1-H
B1H-3198	UE25b1-H
B1H-3211	UE25b1-H
B1H-3277.7	UE25b1-H
B1H-3293.6	UE25b1-H
B1H-3296.5	UE25b1-H
B1H-3519.4	UE25b1-H
B1H-3999	UE25B1-H
C1-1315.0	UE25 C#1
C1-1327.3	UE25 C#1
C1-1522.3	UE25 C#1
C1-1702.5	UE25 C#1
C1-1878.2	UE25 C#1
C1-2067.1	UE25 C#1
C1-2159.5	UE25 C#1
C1-2347.9	UE25 C#1

Appendix 1C--continued

Drill hole number,depth	Drill hole name
C1-2607.2	UE25 C#1
C1-2785.4	UE25 C#1
C1-2992.9	UE25 C#1
C2-1344.6	UE25 C#2
C2-1626.3	UE25 C#2
C2-1633.9	UE25 C#2
C2-1635.8	UE25 C#2
C2-1642.8	UE25 C#2
C2-1745.9	UE25 C#2
C2-1819.4	UE25 C#2
C2-2097	UE25 C#2
C2-2103.1	UE25 C#2
C2-2110.0	UE25 C#2
C2-2278.7	UE25 C#2
C2-2477.9	UE25 C#2
C2-2683.6	UE25 C#2
C2-2747.5	UE25 C#2
C2-2788.8	UE25 C#2
H3-1840	USW H-3
H3-1930	USW H-3
H3-1980	USW H-3
H3-2060	USW H-3
H3-2230	USW H-3
H3-2300	USW H-3
H3-2360	USW H-3
H3-3460	USW H-3
H3-3475	USW H-3

Appendix 1C--continued

Drill hole number, depth	Drill hole name
H3-3560	USW H-3
H3-3575	USW H-3
H3-3660	USW H-3
H4-1312	USW H-4
H4-1420	USW H-4
H4-1455	USW H-4
H4-1550	USW H-4
H4-1656	USW H-4
H4-1665	USW H-4
H4-1720	USW H-4
H4-1735	USW H-4
H4-1785	USW H-4
H4-1805	USW H-4
H4-2060	USW H-4
H4-2250	USW H-4
H4-2430	USW H-4
H4-2520	USW H-4
H5-1667	USW H-5
H5-1800	USW H-5
H5-1852	USW H-5
H5-1917	USW H-5
H5-1960	USW H-5
H5-1966	USW H-5
H5-2020	USW H-5
H5-2660	USW H-5
H5-2690	USW H-5
H5-2710	USW H-5

Appendix 1C--continued

Drill hole number,depth	Drill hole name
H5-2800	USW H-5
H5-3520	USW H-5
H5-3620	USW H-5
H5-3960	USW H-5
H6-1165	USW H-6
H6-1380.6	USW H-6
H6-1426.3	USW H-6
H6-1510.1	USW H-6
H6-1517.3	USW H-6
H6-1672.3	USW H-6
H6-1838.2	USW H-6
H6-1920	USW H-6
H6-1950	USW H-6
H6-2051.4	USW H-6
H6-2130	USW H-6
H6-2160	USW H-6
H6-2354.4	USW H-6
H6-2362	USW H-6
H6-2866	USW H-6
H6-3003	USW H-6
H6-3080	USW H-6
H6-3191.4	USW H-6
H6-3360	USW H-6
H6-3402.8	USW H-6
H6-3550	USW H-6
H6-3605.7	USW H-6
H6-4001.9	USW H-6

Appendix 1C--continued

Drill hole number, depth	Drill hole name
J13-1883	J-13
J13-2011	J-13
J13-2132	J-13
J13-2183	J-13
J13-2382.5	J-13
J13-2532.1	J-13
J13-2684	J-13
J13-2685.2	J-13
J13-2843	J-13
J13-2998	J-13
J13-3005	J-13
J13-3030	J-13
J13-3110	J-13
J13-3150	J-13
J13-3190	J-13
J13-3200	J-13
J13-3246	J-13
J13-3290	J-13
J13-3450	J-13
WT1-1682.4	USW WT-1
WT2-2054	USW WT-2
WT2-2055.6	USW WT-2
WT3-1140.0	UE-25 WT #3
WT4-1571.3	UE-25 WT #4
WT6-320-330	UE-25 WT #6
WT6-390-400	UE-25 WT #6
WT6-650-660	UE-25 WT #6

Appendix 1C--continued

Drill hole number, depth	Drill hole name
WT6-870-880	UE-25 WT #6
WT6-1251.1	UE-25 WT #6
WT6-1255.1	UE-25 WT #6
WT7-1604.8	USW WT-7
WT11-1442.8	USW WT-11
WT12-1302.2	UE-25 WT #12
WT13-1151	UE-25 WT #13
WT14-1309.8	UE-25 WT #14
WT15-1355	UE-25 WT #15
WT15-1356.1	UE-25 WT #15
WT16-1090	UE-25 WT #16
WT16-1210	UE-25 WT #16
WT16-1290	UE-25 WT #16
WT16-1704	UE-25 WT #16
WT16-1708.4	UE-25 WT #16
WT17-810	UE-25 WT #17
WT17-1100	UE-25 WT #17
WT17-1350	UE-25 WT #17
WT18-2037.4	UE-25 WT #18

APPENDIX 2A

Nevada Test Site outcrop sample modes
(Locality numbers, see pl. 1; explanation of symbols under Database Format, p. 8)

Appendix 2A
NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Fm, Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
1	40V-12	TM, BW	DW, D, T		3700	0.6	QLT, CL	13.5	5.4	23.3	65.6		2.5
2	OV-A	TM, AT	DW, V		1570		PD, PI	27.8	28.1	54.7	13.5		
2	OV-B	TM, AT	D		3200			26.5	0	4.8	75.9		4
3	OV-C	TM, AT	DW, D, T		1610		L	21.9	26.3	67.4	4.8		
4	WJC-2-64	TM, BW			3855	0.4	IL	16.8	2.2	8	31.1	An47-24	2
4	WJC-4-64	TM, BW			1481	0.4		14.9	11.8	36.2	45.3		
4	WJC-6-64	TM, BW			1922	2.2		11.8	6.2	24.7	62.9		
5	WJC-15-69	TM, AT	M-DW		1250	4.4		24.1	12	47.2	32.9		3
5	WJC-16-69	TM, AT	DW, T		1480	1.6		34.9	8.7	55.1	28.8		2.5
5	WJC-20-69	TM, BW	DW, T, V		3440	1.1	DAV, IL, ML	15	4.5	35.7	53.1	An15-18	1.5
5	WJC-21-69	TM, BW	DW, D, T		3440		ML, IL	16.7	16.2	41.5	38		1.8
5	WJC-22-69	TM, BW	MW, D, T		3100	0.7	ML, IL	15.2	7.6	36.4	48.9		1.5
6	WJC-23-69	TM, BW	M-DW, V		3400	0.1	ML	16.9	1.6	38	53.6		1.5
7	67FB-1A	P, PC	PW, T		1580	0.2		7.3	1.7	40	52.2		
7	67FB-15	P, PC	DW, D		3500			11.7	1	50.8	38.2		1.6
8	67FB-2B	P, TPP	DW, D, T		2830	0.3		7.9		60.7	31.9		3.1
8	67FB-2C	P, TPP	M-DW, T		6640			1.5	0.5	85	11		
8	67FB-2D	P, TPP	DW, D, T		2360	0.7		17.6	0.3	91.2	2.6		
9	67FB-3B	P, PC	V		2100			13	0	33.3	55.7		3
9	67FB-3C	P, PC	D		2478			9.9	0	38	48.6		
9	67FB-3D1	P, PC	DW, D, T		1500	0.7		10.9	0.6	41.5	50.6		1.5
9	67FB-3D2	P, PC	DW, T		2440			11.7		6.6	87.6		
9	67FB-3E1	P, PC	DW, D, T		1550	0.5		10.8		43.5	49.4		
9	67FB-3E2	P, PC	DW, D, T		1890			12.5		27.1	61.9		
9	TCRB-1	P, PC	D		3780		RL	9.7		34.6	54.2	AN20-28	3
9	TCRC-V	P, PC	V		3780			12		36.4	48.2		2.5
9	TCRD-UV	P, TP	V		3460			6.9		69.5	26.3	AN20-10	2
9	TCRD-BV	P, TP			4100		RL	9.5		70.9	22.2	AN10-20	2.5
9	TCTG-1	P, TP	PW, T		3900	2.3		7.3	0.3	43.8	47.5	AN10-15	1
9	TCTB-2A	P, PC	DW, D, T		3780	0.3		10.7	4.4	40.4	47		1.5
9	TCTB-2B	P, PC	PW, D		3600	0.3		10	5	35	50		2
9	TCTB-3	P, TP	MW, D, T		3950	0.3		12.9	1	49	44.5	AN15-18	2
9	TCTB-4	P, TP	PW, T		3930	0.1		8.2	1.5	35.2	56.5	AN30-25	
9	H-12	P, PC	PW, D, T		3640	3.1	DRV	8.8	1	50.9	38.8	AN20-30	1
9	H-14	P, PC	D		2880			8.9		32.8	51.1	AN30-20	
9	H-15	P, TP	P-MW, D, T		3750	0.3	DRV	8.1	3.3	32.2	52.5	AN15-18	2
9	H-17	P, TP	V		3700			9.1		64.1	27.6	AN20-30	2
10	67FB-9D	TM, BW	DW, D, T		3580	0.2	QLT, IL	14.4	5.3	35.4	55		1.5
10	67FB-9E	TM, BW	DW, D, T		3600	0.1	ML, IL, WT	12.7	7.7	27.4	58.6		2
11	67FB-10B	TM, BW	MW, T		3700	0.4		10.4	5.7	22.8	64.8		2
12	75FB-39	TM, AT	AFT	29.4	1400	18	SI, A, IL	32	14.2	0.4	76.4		1
12	75FB-40B	TM, AT	DW, D, T		1400	0.4	E, ML, DSV, IL	12.3	28.5	66.9	3.5		3
13	75FB-36B	TM, RM	PW, D, T		1400	3.5	ML, DT, DSV	13.1	44.8	37.7	12.6	An20	3
13	75FB-37A	TM, RM	MW, D, T		1400	1.9	ML, DSV	10.1	14.9	63.8	15.6		1.5

Appendix 2A--continued
NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
1	40V-12	7	2	15					1	4.8	tr		tr	tr			3		0.2	0.6	FMB
2	OV-A	5	1	3						2	2	tr		tr		0.6	4	MG		0.9	FMB
2	OV-B	98		47					2	17			tr	tr			19		0.5	2.2	FMB
3	OV-C	1								0.2		tr		tr			4	MG		1.1	FMB
4	WJC-2-64	14	tr	10						7.2				8						0.2	WDQ
4	WJC-4-64	2			5	tr		8		6.8	tr			6						3.6	WDQ
4	WJC-6-64									6.2				4							WDQ
5	WJC-15-69	17	tr	2					2	6.3	tr	tr	tr	tr			5			1.5	WDQ
5	WJC-16-69	25		6					2	5.9	tr	tr	tr	tr			7			1.4	WDQ
5	WJC-20-69	4	2	22					0.8	5.5	tr	tr	tr	tr			7		0.2	1.3	WDQ
5	WJC-21-69	6		10						2.7	tr		tr	tr			9			1.6	WDQ
5	WJC-22-69	8	2	4				9	1	4.5	tr	tr	tr	tr			10			2.1	WDQ
6	WJC-23-69	10	5	13					1	4.8	tr	tr	tr	tr			11		0.2	1.9	WDQ
7	67FB-1A	4								3.5	tr	tr	tr	tr			3			2.6	NC
7	67FB-1B	26		7					1.3	8	tr	tr	tr	tr			8			2	NC
8	67FB-2B	7	1	3					1.4	5.4	tr	tr	tr	tr			4			2	FMB
8	67FB-2C	1	2	tr						2	tr	tr		tr		0.6	1			1	FMB
8	67FB-2D	7	1	7						3.9	tr	tr	tr	tr		0.3	8			2.1	FMB
9	67FB-3B	25		1					1	9.6		9	13	26			4		0.2	1.5	FMB
9	67FB-3C	23		4						11							6			2.4	NC
9	67FB-3D1	6		2						4.9	tr	tr	tr	tr			4			2.4	FMB
9	67FB-3D2	13								4.5	tr		tr	tr			6			2.1	FMB
9	67FB-3E1	8		tr						4.8	tr	tr	tr	tr			4			2.4	FMB
9	67FB-3E2	11								5.9	1			tr			14			0.4	FMB
9	TCRB-1	36						tr	1.5	9.8	tr		tr	tr			5			1.4	FMB
9	TCRC-V	54		4		tr			2	12.7		tr	tr	tr			12		0.4	2.6	FMB
9	TCRD-UV	8							1.5	3.4	tr	tr	tr	tr			2		0.2	0.9	FMB
9	TCRD-BV	20		2					1	5.6	tr	tr	tr	tr			5		0.2	1.3	FMB
9	TCTB-1	13							1	8			tr	tr			3		0.2	1.1	FMB
9	TCTB-2A	24							1	5.9	tr		tr	tr			9		0.2	2.2	FMB
9	TCTB-2B	21								5.8	tr		tr	tr			13			3.6	FMB
9	TCTB-3	20								3.9	tr	tr	tr	tr			8			1.6	FMB
9	TCTB-4	13								4			tr	tr			9			3.1	FMB
9	H-12	23						18	1.5	12.8	tr			tr			5		0.3	1.6	
9	H-14	34						tr		13.3							7			2.7	
9	H-15	27						29	1	9.8	tr		tr	tr			6		0.2	2.3	
9	H-17	16							0.8	4.7	4	tr	tr	tr		1.2	8			2.4	
10	67FB-9D	7	2	tr					0.5	3.5	tr		tr	tr			2		0.3	0.4	FMB
10	67FB-9E	9						14	0.5	5.1		tr	tr	tr			6		0.2	1.3	FMB
11	67FB-10B	7	tr					12	0.5	4.9	tr			tr			7		0.2	1.8	FMB
12	75FB-39	34	tr					tr		7.7			tr	tr			5			1.1	FMB-75
12	75FB-40B	1						1		1.2	tr		tr	tr							FMB-75
13	75FB-36B	2	1							1.6			tr	tr			6			3.2	FMB-75
13	75FB-37A	5	1							4.2	1		tr	tr		0.7	1			0.7	FMB-75

Appendix 2A--continued
NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Fm,Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Felsic Phenocrysts: Phen (%)	Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
14	75FB-38A	TM,RM	MW,T		1400	0.9	IL,ML,DT,MD	17.4	32.9	60.9	5.3		3
14	75FB-38D	TM,RM	DW,D,T		1400	0.5	G,IL	17.9	26	68.4	4		2
15	FB0925b-1	TM,AT	PW,D,T		1460		DT,PO	12.2	23	60	13.5		
15	FB0929b-2	TM,AT	PW,D,T		1470		PO	12.5	17.4	67.4	9.8		
16	62L-601	TM,RM	M-DW,D,T		1470			23.2	38.1	46.6	12.3		
17	62L-613	TM,AT	W,D,T		1540			19.2	21.6	61.8	13.5		
18	63L-41A	TM,AT	MW		1432		B		32.9	56.7	7.2		
18	63L-41B	TM,AT	NW,D		1859				12.9	61.2	15.5		
18	63L-41C	TM,AT			918				4.7	59.7	27		
19	MAT-B-1	TM,AT			3400			18.6	0	0	74.1	An55-30	3
19	MAT-B-2	TM,AT			3550			11.2			76.2		
19	MAT-W-1	TM,AT			6500			4	39.6	48.1	10.4	An10	2
19	MAT-W-2	TM,AT			6000			5.4	56.7	35.5	7.2	An10	2.5
19	MAT-Y-1	TM,AT			3600			10.3	0	89.5	3		3.5
19	MAT-Y-2	TM,AT			3000			12		73.3	22.2	An10-24	3
19	6612	TM,AT			3500	4.5		13.8	12	43	34.5		2.5
20	SJW-0	TM,AT	DW,D		1520		PI,PO,DT	16.7	28.3	64.1	5.1		
20	SJW-1	TM,AT	D,T		1550		PI,ML	16.8	23.8	65	8.5		
20	SJW-2	TM,AT	DW,D,T		1550		ML,PI	15.4	25.4	50.3	20.1		
20	SJW-3	TM,AT	DW,V		1300		PO,PI,L	14.1	5.9	45.6	40.7		
20	SJW-4A	TM,RM			4000			9.5	23.3	42.2	28.1		2
20	SJW-5	TM,RM	DW,D,T		1480			15.8	44	41	13.7		
20	SJW-6	TM,RM	DW,V		1580		SI,L	16	45.5	38.7	14.6		
20	SJW-8	TM,RM	NW		3750		SI	7.9	46.8	30.5	20		
21	EC-2A	TM,RM	T		2700			13.1	45.9	44.5	9.3		
21	EC-2B	TM,RM	V		1400			18.9	47.2	40.4	12.6		
21	EC-3	TM,RM	D		1400			24.8	43.4	42.8	12.9		
21	EC-4	TM,RM	W,D		1300			23.9	49.2	36.3	12.2		
21	EC-5	TM,RM			1400			17.1	52.3	36.8	9.6		
21	EC-6	TM,RM			1450			20.9	23.4	33	35.3		
21	EC-6P	TM,RM			2400			26	0	4.4	66.6	An35-40	4
21	EC-7	TM,AT	D		1450			18.8	23.8	52.7	17.2		
21	EC-8	TM,AT			1250	1		24.8	10.3	40.6	40		
22	TEA-8	TM,RM	D		1420			17.5	34.6	39.5	23		
22	TEA-16	TM,RM	W,D,T		1400			23.8	24.5	51.5	21.8		
22	TEA-22	TM,RM			1430			18.7	35.2	44.2	19.4		
22	TEA-48	TM,RM	D		1470			21.5	34.6	49.3	14.4		
22	TEA-49	TM,RM	W,D,T		1450			17.4	29.6	49	19.3		
23	BBRh	TM,RM	NW,D,T		2950		G	6.1	25.1	58.1	14		
23	BBRi	TM,RM			2900			8.9	39.3	44.4	14.2		
23	BBRj-(1)	TM,AT	D,T		1470		L	8.7	40.9	44.1	13.3		
23	BBRj-(2)	TM,RM	D,T		2740			6.9	32.6	50	16.8		
23	BBRk-(1)	TM,RM	PW,D		1430		DT	16	10.5	34.9	46.2		
23	BBRk-(2)	TM,RM			1370		DT	15.6	10.2	34.1	42		

Appendix 2A--continued
NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Mafic Phenocrysts Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenocrysts Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
14	75FB-38A	2								0.8	tr			tr			tr				FMB-75
14	75FB-38D	3							2.5	1.2	tr			tr			1			0.4	FMB-75
15	FB0929b-1	3	tr	1						2.1	tr	tr		tr			MG			2.2	FMB
15	FB0929b-2	8	tr	1				1		4.8	tr	tr		tr						0.5	FMB
16	62L-601	3								0.8		tr		tr			7	MG		2	
17	62L-613	2		tr						0.6	tr	tr		tr		0.6	5	MG		1.7	
18	63L-41A	4								1.2	tr		tr	tr		0.3	6			1.7	FMB
18	63L-41B	4		1						4.3	tr		tr			1.7	5			4.3	FMB
18	63L-41C	15		4						5.6							10			3	FMB
19	MAT-B-1	111		28					1.5	21.8			6	2		1.3	18		0.5	2.8	
19	MAT-B-2	52		20					1	18			6	1		1.8	16			4	
19	MAT-W-1	3							0.3	1.2	tr	tr	tr	tr		0.4	1		0.1	0.4	
19	MAT-W-2	tr									2					0.6					
19	MAT-Y-1	9		9						4.8		tr	tr	tr			10			2.7	
19	MAT-Y-2	10		2						3.4		tr	tr	tr			4			1.1	
19	6612	32		11						8.9	tr	tr	tr	tr			8			1.6	FMB
20	SJW-0	3	tr	tr						1.2	tr	tr		tr		0.2	3	MG		1.2	FMB
20	SJW-1	7	tr	tr						1.6	tr	tr	tr	tr		0.2	3	MG		0.7	FMB
20	SJW-2	7	tr	6		1				3.2	tr	tr	tr	tr		0.2	2	MG		0.5	FMB
20	SJW-3	2	tr	6						4.3	tr	tr	tr	tr		0.2	6	MG		3.2	FMB
20	SJW-4A	15	tr	2		tr				4.5			tr	tr			7	MG		1.8	FMB
20	SJW-5	2								0.8				tr			1	MG		0.4	FMB
20	SJW-6	1								0.4				tr			2	MG		0.8	FMB
20	SJW-8	7								2.4							MG			0.3	FMB
21	EC-2A	1								0.3								MG			FMB
21	EC-2B	tr																MG			FMB
21	EC-3	2								0.6							1	MG		0.3	FMB
21	EC-4	6								1.9							MG			0.3	FMB
21	EC-5	2								0.8							1	MG		0.4	FMB
21	EC-6	18	tr	2		tr				6.5		tr	tr	tr			5	MG		1.6	FMB
21	EC-6P	72	69	12					1	24.8			3	tr		0.5	23		0.5	3.7	FMB
21	EC-7	9		2						4	tr	tr	tr	tr			6	MG		2.2	FMB
21	EC-8	18		4						7.1	tr		tr	tr		0.6	6	MG		1.9	FMB
22	TEA-8	2								0.8							5	MG		2	
22	TEA-16	3								0.9							4	MG		1.2	
22	TEA-22	3								1.1							tr	MG			
22	TEA-48	3								0.9							2	MG		0.6	
22	TEA-49	2								1.2							2	MG		0.8	
23	BBRh	4	tr							2.2							1	MG		0.5	FMB
23	BBRi	1	1							0.7		tr					3	MG		1.1	FMB
23	BBRj-(1)	1	tr							0.7				tr			1	MG		0.7	FMB
23	BBRj-(2)	1	tr							0.5				tr			tr	MG			FMB
23	BBRk-(1)	11	tr	3						6.1	tr	tr		tr			5	MG		2.1	FMB
23	BBRk-(2)	23	tr	1		tr				11.2		tr	tr	tr		0.4	4	MG		1.8	FMB

Appendix 2A--continued
NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Fm, Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Felsic Phenocrysts Phen (%)	Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
23	BBR1	TM,RM	T		1500		DT,PO	11.3	12.4	31.9	45.5		
24	BBRn-(1)	TM,AT	T		1670		ML,PL,DT	12.3	12.2	74.1	8.8		
24	BBRo	TM,AT	NW		1680		PL,DT,CA,ML	10.2	20.4	65.5	9.3		
25	SB1	TM,RM	D,T		2900		PL	6.9	23.8	51.7	23.3		
25	SBn	TM,RM			1430				31.5	48.3	14.8		
25	FB0056a-1	TM,RM	PW,D,T		2940			8	33.7	47	16.6		
25	FB0056a-2	TM,RM	D		2940			5.3	27.1	51	16.7		
25	FB0056b-1	TM,RM	DW,V,T		1470		DT	28.1	14.7	37.2	37.5	An10-40	
25	FB0056b-2	TM,RM	DW,V		1400			26.6	9.1	42.2	41.4		
26	TM-2	TM,RM			1440	0.7			18.9	46.8	26		
27	TM-4b	TM,AT			1000			27.4	12	64.6	18.2		
27	TM-4c	TM,AT	V		1000	2.6		26.5	9	67.5	19.2		
28	SM-3	TM,AT	V		1000	0.9		25.7	18.2	58.3	21		
28	SM-4	TM,AT			1000	1.1			9.8	63.1	21		
28	SM-5	TM,AT	V		1420	3.4			16.2	58.7	15.6		
29	RM-4600B	TM,RM	DW		1852				39.6	43.6	14.3		
29	RM-4600C	TM,RM	W,D,T		2560			14.2	46.7	38.8	13.9		
29	RM-4600D	TM,RM	M-DW		1173				7.3	45.8	37.6		
29	RM-4600E	TM,RM	W,D,T		1250		PO	13.6	9.4	49.4	35.3		
29	RM-4600F	TM,RM	NW		1388				53	41	2.5		
29	RM-4600G	TM,RM	PW,D		1350			12.4	25.6	70.2	2.3		
30	MM-1	TM,RM	W,T		1400			13.4	39.5	40.6	18.2		
30	MM-2	TM,RM	D		1470			13	43.7	34.3	20.3		
30	MM-3	TM,RM	DW,T		1440			8.4	32.2	47.1	19		
30	MM-4	TM,RM	DW,T		2850			7	32.2	47.7	17.5		
30	MM-5	TM,RM	DW,T		1420		CL	9.4	19.4	50	26.8		
30	MM-6	TM,RM	NW,T		1500		PO	10.1	28.9	37.5	29.6		
31	MM-7	TM,AT	NW,T		2920		PO	6.2	27.4	56.6	9.9		
31	MM-8	TM,AT	PW,D,T		2730		PO	10.2	33.1	55.4	6.1		
31	MM-9	TM,AT	W,D,T		1530		ML	22.4	15.1	71.1	9.9		
31	MM-10	TM,AT	DW,D,T		1440		PO	16.8	14.1	50.2	24.8		
32	7-73-2A	TM,RM	W,T		1470		PO	11.9	39.4	34.8	22.8		
32	7-73-2B	TM,RM	W,D,T		1520		PO	20.6	26.5	51.1	20.1		
32	7-73-2J	TM,RM	NW,T		1450			9.4	17.6	47	27.9		
33	7-73-2C	TM,AT	NW,T		1470		PO	13.2	31.4	57.2	8.7		
33	7-73-2E	TM,AT	T		1460		PO,L	14.5	30.1	64.1	5.1		
33	7-73-2F	TM,AT	W,D,T		1470		PO	23.4	18.8	68.9	8.6		
33	7-73-2G	TM,AT	W,D,T		1470		DT,PO	21.8	18.3	53.2	21.1		
33	7-73-2H	TM,AT	W,D,T		1470		PO	26.5	10.5	53.4	24.9		
34	63C-8	TM,RM	DW,D,T		1400		WT	22.7	35.2	43.1	17.9	An20	3
35	81FB-12	CH	NW,T		3650	2.5	DRV	11.7	28.9	20	41.5		1.6
36	TO-2F	P,TP	W,D		2919			9.8	0.4	71.6	20	AN9-28?	
36	TO-2G	P,TP	DW,D		2351			17.4	0.5	63.5	29.7	AN26?	
36	TO-2H	P,TP	DW,V		2809			16.1	0.2	58.8	31.9	AN40+/-	

Appendix 2A--continued
NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Mafic Phenocrysts Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenocrysts Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
23	BBR1	13	tr	1						8.2		tr		tr			3	MG		1.7	FMB
24	BBRn-(1)	6		tr		tr				2.9	tr	tr		tr			4	MG		1.9	FMB
24	BBRo	4	1	1						3.5	1	tr				0.5	1	MG		0.5	FMB
25	SB1	1	tr							0.5				tr	tr		1	MG		0.5	FMB
25	SBn	tr		tr						1.3								MG		1.3	FMB
25	FB0056a-1	4	tr	tr						1.7				tr			2	MG		0.8	FMB
25	FB0056a-2	3	tr							1.9				tr			5	MG		3.2	FMB
25	FB0056b-1	28	tr	8						8.7			tr	tr			7	MG		1.7	FMB
25	FB0056b-2	15	tr	9						6.4				tr			3	MG		0.8	FMB
26	TM-2		tr			tr		tr		6.8								MG		0.7	
27	TM-4b									3	tr	tr						MG		1.1	
27	TM-4c									3.3	tr	tr						MG		0.7	
28	SM-3									1.9	tr	tr	tr	tr				MG		0.7	
28	SM-4		tr							3.8	tr	tr	tr	tr				MG		1.2	
28	SM-5									4.2		tr	tr	tr		0.1		MG		1.8	
29	RM-4600B	2								0.7						0.3	5			1.8	FMB
29	RM-4600C	1		tr						0.3				tr			1	MG		0.3	FMB
29	RM-4600D	22		2						6.2							12			3.1	FMB
29	RM-4600E	7		1						4.6				tr			2	MG		1.1	FMB
29	RM-4600F	1								0.5	tr			tr		0.6	6			3	FMB
29	RM-4600G	2	tr							1.2	tr	tr		tr			1	MG		0.6	FMB
30	MM-1	2	tr							1				tr			1	MG		0.5	
30	MM-2	3		tr						1.5				tr			tr	MG			
30	MM-3	1								0.8			tr	tr			1	MG		0.8	
30	MM-4	2								1				tr			3	MG		1.5	
30	MM-5	4		1						3.7				tr			tr	MG			
30	MM-6	5		tr						3.2				tr			1	MG		0.6	
31	MM-7	7		tr						3.8	tr			tr			4	MG		2.2	
31	MM-8	5		3						2.8	1	tr	263	15		0.3	6	MG		2.1	
31	MM-9	4		2						1.7	2	tr	tr	tr		0.5	4	tr		1.4	
31	MM-10	9		10						7.8	tr	tr	tr	tr			7	MG		2.9	
32	7-73-2A	3								1.7				tr			2	MG		1.1	FMB
32	7-73-2B	4		1						1.6		tr		tr			2	MG		0.6	FMB
32	7-73-2J	7								5.1				tr			3	MG		2.2	FMB
33	7-73-2C	3		tr						1.5	1	tr		tr		0.5	1	MG		0.5	FMB
33	7-73-2E	1		tr						0.5	tr	tr	tr	tr							FMB
33	7-73-2F	3		1						.1	tr	tr	tr	tr			8	MG		2.3	FMB
33	7-73-2G	10		4						4.3	2	tr	tr	tr		0.6	7	MG		2.1	FMB
33	7-73-2H	21		11						8.2	tr	tr	tr	tr			11	MG		2.8	FMB
34	63C-8	8						1	0.1	2.8		tr	tr	tr			3			1	
35	81FB-12	39								9.2				tr			2			0.5	FMB-81
36	TO-2F				tr					3.5			tr			0.4		MG		4.2	JTO
36	TO-2G				tr			tr		4.4	tr		tr					MG		2	JTO
36	TO-2H							tr		6.1			tr			0.2		MG		2.7	JTO

Appendix 2A—continued
NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Fm,Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts: Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
36	TO-4A	P,PC	W,D		2974			7.1	2.4	46.2	44.3	AN38-60	
36	TO-5B	P,TC	W,D		2576			0.9		87	4		
36	TO-5C	P,TC	DW,D		2876			2.4		88	3		
36	TO-5D	P,TC	DW,D		2985			1.9		95	2		
36	TO-5E	P,TC	DW,D		2868			1.4		97			
36	TO-5F	P,TC	DW,D		2865			10.5		83.1	8		
36	TO-6A	P,TC	DW,D		1930			10.7		90.3	6.3		
36	TO-6B	P,TC	DW,D		2394			15.7		79.8	14.3		
37	TO-42H	P,PC	PW,D		2120			9.7	2	48.3	41.5	AN25-30	
37	TO-42J	P,PC	W,D		2033			11.9	0.8	42.3	44.4	AN27-35	
37	TO-42K	P,PC	N-PW,D		4346			7.3	2.8	46.7	42.6		
37	TO-42P	P,TC	NW		5544			1.3		92	1.4		
37	TO-42R	P,TC	W,D		7276			3		94.9	0.9		
37	TO-42S	P,TC	DW,D		1926			23.4		81.6	12.2		
37	TO-42T	P,TC	W,D		1414			15.8		77.7	12.9	An15	
37	TO-43A	P,TC	PW		4074			1.7		90	4		
37	TO-43B	P,TC	W,D		4280			4.9		79.6	10.4		
37	TO-43C	P,TC	W,D		2744			11.2		86.3	8.1		
38	JD-1	TM,RM	DW,D		3105			13.2	38.6	41.1	18.3	An20?	
38	JD-5	TM,RM	PW		6104			4.9	15.2	65.2	13.2	An37	
38	JD-111A	TM,RM	W,D		3502			8.6	36.4	45.1	17.2	An35	
38	JD-111B	TM,RM	DW,D		4635			9	38.5	44.7	15.3		
38	JD-111C	TM,RM	DW,D		4253			9.5	43.8	37	17	An15-20	
38	JD-111E	TM,RM	W,D		3959			10.1	37.4	42.1	17.5	An20+	
38	JD-111F	TM,AT	PW,D		4360		PI,ML	6	12.7	76.9	6.9		
38	JD-111G	TM,AT	PW,D		1144		PI	15	41.4	53.1	4.4		
38	JD-112A	P,TC	W		4410			2.6		98	tr		
38	JD-112B	P,TC	W,D		7245			1.8		96.2	tr		
38	JD-112C	P,TC	W,D		2378			8.7		90.8	1.9		
38	JD-112D	P,TC	W,D		6386			3.2		96.5			
38	JD-112E	P,TC	W,D		6077			3.8		92.1	1.4		
38	JD-112F	P,TC	DW,D		2346			13		84.5	8.6		
38	JD-112G	P,TC	PW,D		4134			7.4	2	84	6.5	AN15-20	
39	5896-P2	P,TPP	NW		3750		DT	3.7	57.2	39.3	39.3	AN30-35	1.2
39	5896-P3	P,TPP	NW,D,T		3760			3.1	tr	86.1	11.2	An30-35,r.i.	2.5
39	5896-P5	P,TPP	PW,D,T		1510	1.3		7.5	tr	92	5		6
39	5896-P7	P,TPP	DW,D,T		3850	4	DT	15	0.3	90.5	4.1	AN20-30	2
39	5896-P7P	P,TPP			2336			29.3		70.9	22.4	AN35-25	3.5
40	PLO-861-B1	TM,RM	NW		1927				2.1	40.8	46.8		
40	PLO-861-B2	TM,RM	NW		1250				4.2	42.6	44.5		
41	61TNEF	TM,RM	M-DW,T,V		3430		DT	17.8	12.7	43.1	35.2	An20-25	
42	11-103-100C	P,TC	W,D		3740			5.5		96.1			
42	11-103-100D	P,TC	PW,D		3337			4.5		94.7	1.3		
42	11-103-101A	TM,RM	NW		2100			9.5	34.2	52.8	12.1	An30	

Appendix 2A—continued
NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
36	TO-4A				tr					3.8	tr		tr					MG		3.3	JTO
36	TO-5B	tr									tr							MG		9	JTO
36	TO-5C	tr			tr									tr		1		MG		7	JTO
36	TO-5D	tr									tr			tr				MG		3	JTO
36	TO-5E	tr									tr							MG		3	JTO
36	TO-5F				tr					2.7				tr				MG		4.7	JTO
36	TO-6A									1	tr		tr			0.5		MG		2	JTO
36	TO-6B									3	tr					0.8		MG		1.9	JTO
37	TO-42H							tr		5.9	tr	tr	tr	tr				MG		2.4	JTO
37	TO-42J									7.4	tr					1.6		MG		3.3	JTO
37	TO-42K									6	tr	tr	tr	tr	tr			MG		1.9	JTO
37	TO-42P									2.7	tr		tr	tr				MG		4.1	JTO
37	TO-42R									1.4	21	1	4	10		1.9		MG		0.9	JTO
37	TO-42S									4.5	tr	tr		tr		0.2		MG		1.6	JTO
37	TO-42T									8.5			tr	tr				MG		0.9	JTO
37	TO-43A									5	tr		tr	tr	tr		tr	MG			JTO
37	TO-43B									5.2			tr			1		MG		3.8	JTO
37	TO-43C									3.2	tr		tr	tr				MG		2.3	JTO
38	JD-1									1								MG,HM		0.9	JTO
38	JD-5									2.9			tr			0.3		MG		2.[illegible]	JTO
38	JD-111A				tr			tr		0.6			tr	tr				MG		0.6	JTO
38	JD-111B									0.2				tr				MG		1.2	JTO
38	JD-111C									1.8			tr	tr				MG		0.5	JTO
38	JD-111E									1.7			tr	tr				MG		1.2	JTO
38	JD-111F									2						0.4				1.2	JTO
38	JD-111G							tr		0.9			tr	tr			tr	MG			JTO
38	JD-112A	tr								0.9				tr		0.7	tr	MG			JTO
38	JD-112B				tr					1.5				tr		0.8		MG		1.5	JTO
38	JD-112C									3.4			tr	tr		0.5		MG		3.4	JTO
38	JD-112D	tr								3			tr	tr				MG		0.5	JTO
38	JD-112E	tr								1.4			tr	tr		1.4		MG,HM		2.8	JTO
38	JD-112F									5			tr	tr		0.7		MG		1.3	JTO
38	JD-112G									4.5				tr		0.3		MG		2.6	JTO
39	5896-P2	4							0.7	2.9				tr			1			0.7	
39	5896-P3	1	1						1.2	0.9	4	tr		1			2			1.7	
39	5896-P5	4							0.9	2	3		3	1			2		0.5	0.5	
39	5896-P7	8	1					6	1	2.6	tr	tr	tr	tr			14		0.5	2.4	
39	5896-P7P	17		15					1	4.7	tr	tr	tr	tr			14			2.1	
40	PLO-861-B1	29		6				12		7.3					2	0.4	12			2.5	FMB
40	PLO-861-B2	18		3				6		6.8							6			1.9	FMB
41	61TNEF	39	1	8		3				8.4			tr	tr			4			0.6	FMB
42	11-103-100C									2.4	tr		tr	tr				MG		1.5	
42	11-103-100D									3.3	tr		tr	tr	tr			MG		0.7	
42	11-103-101A	tr						tr						tr				MG		1	

Appendix 2A—continued
NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Fm, Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Felsic Phenocrysts: Phen (%)	Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
42	11-103-101B	TM,RM	PW,D		2180			11.9	53.8	31.2	14.6		
42	11-103-101C	TM,RM	PW		2967			10.5	32.8	54.8	11.8		
42	11-103-101D	TM,RM	W,D		4280			5.8	34.8	38.8	25.2	An20	
42	11-103-102A	TM,RM	PW,D		3920			7	3.1	44.4	22.5		
42	11-103-102B	TM,RM	W,D		2700			22.4	24	45.5	24.8	An27+/-	
42	11-103-102C	TM,RM	PW,D		4280			9.7	27.8	28.1	37.4		
42	11-103-102D	TM,AT	PW,D		3161		PI	12.7	36	56.8	3.2		
42	11-103-102E	TM,AT	W,D		2475		PI	12.3	42	54.1	3.3		
43	SC-2A	P,PC	MW,T		2770	2.2		11.5		55.6	37.1		1.5
44	SC-4A	TM,RM	DW,D		2760			14.8	47.9	36.7	13.2	An24+/-5	
44	SC-4B	TM,RM	W,D		2300			17.1	37.7	39.7	19.7	An27-32	
44	SC-4C	TM,AT	DW,V		1748		PI	29.7	6.2	78.2	10.4	An32-45	
44	SC-4D	TM,AT	DW,D		1056			28.5	6.6	71.1	15.6	An38+/-5	
44	SC-4E	TM,AT	PW,D		2418			12.5	23.1	45.5	25.1	An45+/-10?	
44	SC-4F	TM,AT	DW,V		1012		PI	31.1	8.6	71.4	14	An40+/-5	
44	SC-4G	TM,AT	DW,D		1746		PI	23.7	9	76	10.9	An37+/-10	
45	SC-4H	TM,AT	DW,D		1547			22	10.3	53.8	25	An44+/-5	
46	BD-1	TM,RM	NW,T		3600	0.5	PO,ML,DT	8.2	40.7	45.8	12.5		2
46	BD-2	TM,RM	PW,D,T		3360	0.4	DT,PI	8.8	42.3	31.3	25.3		2
46	BD-3	TM,RM	NW,T		3520	2.1	DT,RT	13.6	23.2	50.2	24.4		3
46	BD-4	TM,AT	PW,D,T		3240	3.8	ML,SI	11.1	30.2	65.9	1.1		
46	BD-5	TM,AT	MW,D,T		3540	2.2	ML	11.3	23.8	64.7	8.4		2
47	WH-1J	TM,AT	DW,V		2492			25.7	5.1	79.1	7.2	An32	
47	WH-1N	TM,AT	DW,D		2945			20.5	20.3	50.8	22.8	An30+/-4	
47	WH-1P	TM,AT	W,D		1128			28.5	16.2	57.3	21.8	An33+/-5	
47	WH-1R	TM,AT	DW,V		1938			26.4	10.4	76.3	8.8	An40	
47	WH-1S	TM,AT	PW		2538			20	6.7	78	12.2		
48	WH-1E	TM,RM	N-PW,D		3333			9.7	48.1	35.1	14.3		
48	WH-1F	TM,RM	DW,D		1980			15.6	41.1	42.7	15.5	An13-14	
48	WH-1G	TM,RM	DW,D		2673			14.1	39.4	46	13	An16	
48	WH-1H	TM,RM	PW,D		2121			19	40.4	33.5	25.1	An8+/-3	
48	WH-1M	TM,RM	NW		4000			4.4	41.5	48	10.5		
48	WH-1V	TM,RM	PW,D		2912			12.2	19.8	44.4	27.7	An25+/-5?	
49	0-411	TM,RM	W,D		3464			14.9	24.7	46.4	25	An25?	
49	0-414	TM,AT	PW,T		6510		PI,WT	4.8	32.1	52.8	9.3	An17-20	
49	0-415	TM,AT	W,D		3653		PI	11.1	36.1	58.9	2		
49	0-416	TM,AT	DW,D		3696		PI	14	43.8	50.2	4.7		
49	0-417	TM,AT	DW,D		3421			15.1	14.6	64.1	17.1	An40	
49	0-418	TM,AT	DW,D		2634			27.4	12.2	64	20.4	An40	
49	0-419	TM,AT	W,D		4300			14.2	14.6	46.6	32.2	An40	
50	TM5888B	TM,RM	T		1080	0.1		12.7	44.1	54.3	0.7		
51	TM5888C	TM,AT			3103				39.1	56.8	3.2		
52	TM6089B	TM,RM	T		1150	0.7		13.8	33.3	63	1.4		
52	TM6185G	TM,RM	T		1012			19.8	33.8	46.9	18.1		

Appendix 2A--continued
NEVADA TEST SITE OUTCROP SAMPLE MODES

		Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenocrysts				
Loc	Sample number	Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
42	11-103-101B	tr																MG		0.4	
42	11-103-101C									0.3	tr		tr	tr				MG		0.3	
42	11-103-101D									0.4			tr	tr				MG		0.8	
42	11-103-102A									1.1			tr	tr				MG		0.7	
42	11-103-102B				tr					4.5				tr		0.2		MG		1.2	
42	11-103-102C				tr					4.8				tr		0.2		MG		1.7	
42	11-103-102D				tr					1			tr	tr		0.7		MG		0.5	
42	11-103-102E									0.3	tr		tr	tr	tr		tr	MG			
43	SC-2A	15		3					1	5.6	tr	tr	tr	tr			5			1.6	JTO
44	SC-4A									1	tr		tr					MG		1.2	JTO
44	SC-4B									1.7	tr		tr					MG		1	JTO
44	SC-4C									3.5			tr		tr	0.2		MG		1.5	JTO
44	SC-4D									4.7			tr		tr	0.3		MG		1.7	JTO
44	SC-4E									5.6			tr	tr		0.7		MG			JTO
44	SC-4F		tr							4.4			tr		tr	0.2		MG		1.3	JTO
44	SC-4G									2.7	tr		tr		tr	0.2		MG		1.5	JTO
45	SC-4H									8.3					tr	0.9		MG		1.8	JTO
46	BD-1	3							0.5	1				tr							
46	BD-2	2							0.8	0.7				tr			1		0.3	0.4	
46	BD-3	8							0.7	2				tr			1		0.3	0.2	
46	BD-4	5	tr	tr						1.4	1	tr		tr		0.3	4			1.1	
46	BD-5	6		tr		tr				1.2	tr	tr		tr		0.3	6			1.9	
47	WH-1J									5.7						0.8		MG		2.3	JTO
47	WH-1N									4.2	tr			tr						1.8	JTO
47	WH-1P							tr		3.2	tr		tr	tr				MG		1.6	JTO
47	WH-1R									2.6	tr		tr	tr		0.4		MG		1.6	JTO
47	WH-1S							tr		1.8	tr		tr			0.2		MG		1.2	JTO
48	WH-1E									1.2	tr		tr			0.3		MG		0.9	JTO
48	WH-1F									0.3	tr		tr			0.3		MG,HM		0.3	JTO
48	WH-1G									0.5				tr		0.3		MG,HM		1.1	JTO
48	WH-1H									0.2	tr			tr		0.3		MG		0.4	JTO
48	WH-1M	2								1.6		tr		tr		0.6	5			3.3	FMB
48	WH-1V									6.8			tr	tr				MG		1.4	JTO
49	O-411									2.1	tr		tr					MG		1.7	JTO
49	O-414					tr				2.6			tr	tr		1.3		MG		1.6	JTO
49	O-415							tr		1.9						0.2		MG		0.7	JTO
49	O-416									0.6						0.2		MG		0.6	JTO
49	O-417									2.5				tr		0.2	tr	MG		1	JTO
49	O-418									3.5	tr		tr			0.1		MG		0.7	JTO
49	O-419									4.2				tr		1		MG		1.3	JTO
50	TM5888B			tr						0.7	tr	tr				0.6	tr	MG			FMB
51	TM5888C	1								0.2	tr	tr				0.6	3			0.7	FMB
52	TM6089B									1.4	tr	tr				0.6	tr	MG		0.7	FMB
52	TM6185G	2								1							E	MG			FMB

Appendix 2A--continued
NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Fm,Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Felsic Phenocrysts Phen (%)	Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
52	TM6189B	TM,RM	T		1368	0.2		10.7	49.5	47	35		
52	TM6189C	TM,RM	T		1400	3.3		23.5	7.6	47.6	29.3		
53	TM6894A	TM,RM	V,T		1000	0.4		24.7	31.9	44.1	21.8		
53	TM6894B	TM,RM	V,T		1000	0.6		20.8	32.2	51.4	16.3		
54	TM7090I	TM,AT	DW,D,T		1540			24	30	42.2	25.1		
55	TM8338A	TM,TCC	W,T		1440			14	33.3	59.2	7.4		
55	TM8338B	TM,TCC	W,T		1380		G	28	13.7	57.5	22.5		
56	TM8692	TM,AT	T		1000	0.1		14.7	36	60	4		
57	TM8795	TM,RM	W		1000	2.4		21.9	13.2	37.9	40.6	An30	
58	TW8-T3	TM,RM	W		1000	0.2			14.4	30.8	43.6		
59	62-ENH-11	TM,AT	DW		986				6.3	36.2	41.3		
60	RK-62-1	TM,AT	DW,D		1140				15.6	47.3	30.3		
61	RK-62-3	TM,AT	DW,D		1294				4.1	33.3	48.3		
62	RK-62-11	TM,AT	NW		1913	1.9	FB		12	60.5	22.5		
62	RK-62-12	TM,AT	DW		1261		PO		6.2	31.7	44.2		
63	W8(=8-M)	TM,RM			3300			22.3	0	24.3	53.7	An25-35	3
63	8Tpr-1(1)	TM,FC	T		1470		L?	30.2	15.7	33.7	42.7		
63	8SC	TM,RM			3400			24.9	0	28	55.2	An35-25	
63	8Tprim	TM,FC			3480			24.8			67	An30-35	2
63	TW8-135	TM,FC			1450			29.1	12.6	46.9	33.6		
63	TW-8-1080	TM,FC			1360			33.6	15.5	39.7	36.8		
64	8-I-1	TM,RM			1000	0.1		19.2	22.9	39	33.3		
64	8-I-2	TM,AT			1440	0.5			48	35	17		
65	8Tpr1-(2)	TM,FC			1470			31.5	14.5	39.3	36.8		
66	ENH62-40	TM,FC			3330	0.99		24.2	9.4	39.6	43.4		

Appendix 2A--continued

NEVADA TEST SITE OUTCROP SAMPLE MODES

Loc	Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyst, date
52	TM6189B	tr	tr	tr							tr	tr				0.6					FMB
52	TM6189C									11.9	tr	tr		tr		0.6	3			3.4	FMB
53	TM6894A			tr						0.8	tr						1.2			1.2	FMB
53	TM6894B	tr	tr	tr				tr		0.4							tr			0.4	FMB
54	TM7090I	4	2							1.6		tr		tr			4	MG		1.1	FMB
55	TM8338A	tr									tr							MG			FMB
55	TM8338B	17	tr	1				tr		4.6			tr	tr		0.2	5	MG		1.3	FMB
56	TM8692	tr									tr					0.6	tr	MG			FMB
57	TM8795		tr							5.4			tr	tr				MG		2.2	FMB
58	TW8-T3		tr							8		tr	tr	tr		0.6		MG		3	FMB
59	62-ENH-11	27		10	tr					7.4	tr		tr	tr		0.6	4	MG		1.6	
60	RK-62-1	12		1	tr					4.3	tr		tr	tr		0.6	7			2:3	
61	RK-62-3	30		8						9.7	tr			tr		0.3	17			4.3	
62	RK-62-11	4		2												0.2				3.2	
62	RK-62-12	36		15						12.7	tr		tr	tr		0.25	19			4.7	
63	W8(=8-M)	110	4	30		2			1	19.8			tr	1		0.1	15		0.5	2	FMB
63	8Tpr-1(1)	21	1	3						5.6			tr	tr		0.3	10	MG		2.2	FMB
63	8SC	91		34		1				14.9			tr	tr			16			1.9	FMB
63	8Tprim	114	138						1.8	29.1			1	tr		0.1	33		0.2	3.8	FMB
63	TW8-135	17	tr	7						5.7			tr	1		0.2	4	MG		1	FMB
63	TW-8-1080	25	tr	7						6.9			tr	tr		0.2	4	MG		0.8	FMB
64	8-I-1	tr	tr	tr						3.1								MG		1.5	FMB
64	8-I-2	2								0.2								MG			FMB
65	8Tpr1-(2)	26	7	6		1				8.4			tr	tr		0.2	4	MG		0.9	FMB
66	ENH62-40	35	11		8					6.7	tr			tr		0.2	8			1.01	

APPENDIX 2B

Additional data for Nevada Test Site outcrop sample modes

Appendix 2B

Locality number	Sample number	Additional data
1	4OV-12	Caprock. Plagioclase altered. Quartz slightly wormy and euhedral.
2	OV-A	Abundant perthitic texture in alkali feldspar. Zircon, allanite, and sphene around opaque grains. Fine-grained mosaic lithic.
2	OV-B	Pumice from devitrified lower ash-flow unit (mafic). Porphyritic, vesicular, and microlitic groundmass with plagioclase, quartz, and alkali feldspar. Secondary quartz in vesicles. Feldspars resorbed. Large feldspars are "moth eaten", wormy. Cores of clinopyroxene altered to chlorite aggregates.
3	OV-C	Glomerocrysts of plagioclase, alkali feldspar, and biotite. Perthite common. Armoring of plagioclase by alkali feldspar.
4	WJC-2-64	Caprock. Some plagioclase, 50 percent resorbed. Tridymite(?) in small cavities. Quartz is embayed and rounded. An37-24, oscillatory zoning; An42-29, progressive zoning; An47-34, oscillatory and progressive.
4	WJC-4-64	Caprock. Quite a few plagioclase cores altered to carbonate. Plagioclase is wormy.

Appendix 2B--continued

Locality number	Sample number	Additional data
4	WJC-6-64	Caprock. Rock extensively altered. Mafics averaged from other slides and subtracted from total altered phenocrysts. Plagioclase altered to the material occurring in the cores of the phenocrysts in WJC-4-64, and absent in WJC-2-64. These three thin sections illustrate progressive stages of the alteration of plagioclase. An attempt to count the mode was made, on the basis that the alkali feldspar and quartz was not altered. The altered material was counted as plagioclase plus mafics, and corrected to the average total mafics of the other three thin sections of the caprock.
5	WJC-15-69	Gray rhyolitic pumice interspersed with quartz latite pumice. Quartz and sphene in light pumice. No mafic lava.
5	WJC-16-69	Wormy plagioclase. No mafic lava.
5	WJC-20-69	Quartz-latite caprock. Quartz slightly wormy. Pumice is phenocryst poor.
5	WJC-21-69	Quartz-latite caprock. Quartz slightly wormy. Several plagioclase grains resorbed. 80 percent quartz-latite pumice, 20 percent rhyolitic pumice with alkali feldspar and quartz. Some mantling of plagioclase by alkali feldspar.
5	WJC-22-69	Quartz-latite caprock. Some clinopyroxene has altered to semi-opaque ferruginous brown crud.
6	WJC-23-69	Quartz-latite caprock. Quartz slightly wormy.
7	67FB-1A	No description.
7	67FB-1B	Calcite in groundmass.
8	67FB-2B	70 percent rhyolitic pumice, 30 percent mafic pumice.

Appendix 2B--continued

Locality number	Sample number	Additional data
8	67FB-2C	Vapor-phase crystallization. 90 percent rhyolitic pumice, 10 percent mafic pumice.
8	67FB-2D	80 percent mafic pumice, 20 percent rhyolitic pumice. Vapor-phase crystallization. Chocolate Mountain lithics.
9	67FB-3B	Rhyolitic vitrophyre.
9	67FB-3C	No description.
9	67FB-3D1	Zoned anorthoclase with opaques and biotite.
9	67FB-3D2	80 percent mafic pumice (20 percent rhyolitic pumice). About 2 percent veinlets; quartz-filled fractures and low index, low birefringent mineral, zeolite or tridymite.
9	67FB-3E1	No description.
9	67FB-3E2	5% +/- fractures, partly filled with quartz and other minerals. Microbrecciated in places.
9	TCRB-1	Rhyolitic lava (flow banding).
9	TCRC-V	Rhyolitic lava, vitrophyre.
9	TCRD-UV	Rhyolite vitrophyre, marker lava z.
9	TCRD-BV	Plagioclase An10-20, cores An25. Most alkali feldspar is anorthoclase, probably after plagioclase.
9	TCTB-1	Shard-pumice tuff(?). Mantling, embayment of feldspars. No sphene.
9	TCTB-2A	Some plagioclase altered to alkali feldspar.
9	TCTB-2B	Quartz veinlets. Opaque-rimmed lithics.
9	TCTB-3	Opaque-rimmed lithics. Zeolite lining cavities. Plagioclase mottled and replaced by alkali feldspar. Quartz veinlets.

Appendix 2B--continued

Locality number	Sample number	Additional data
9	TCTB-4	Incipient vapor-phase crystallization. Vesicular, shard-pumice tuff. Plagioclase cores = An18-15, rimmed by anorthoclase.
9	H-12	Caprock type or local intracauldron unit. Good plagioclase zoned from An30-20; where mantled by alkali feldspar, there is sharp and contrasting R.I. break; no gradational mantling or mottling.
9	H-14	Coarsely devitrified rhyolitic flow. Quartz (cristobalite) and feldspar in lithophysae. Second lava above Pah Canyon.
9	H-15	Plagioclase An15-18; some plagioclase cores An30-35. Secondary quartz in veinlets and lithophysae.
9	H-17	Flow D, Tcrd. Plagioclase An20; cores An30. Parallel orientation of feldspar microlites in layers alternating with microlite free layer.
10	67FB-9D	Caprock. Devitrification granophyric or recrystallized. Rock appears altered.
10	67FB-9E	Caprock (More alt. than 9D). Granophyric and altered. No sphene. Underlies sediments under Tuff of Fleur-de-lis.
11	67FB-10B	Highest cooling unit (caprock). Plagioclase gone, but outlined and contains secondary aggregates.
12	75FB-39	Ash-fall tuff. Calcite replacing shards in groundmass.
12	75FB-40B	Rhyolitic subunit.
13	75FB-36B	Rhyolitic subunit. Calcitized, possibly silicified.
13	75FB-37A	Calcitized. Sparse,faint, flattened pumice.

Appendix 2B--continued

Locality number	Sample number	Additional data
14	75FB-38A	Basal lithophysal zone. Common flattened pumice. Calcite alteration.
14	75FB-38D	Sanidine, 42 points of total count. Calcite alteration.
15	FB0929b-1	Incipient vapor-phase crystallization in pumice. Perthite present, but uncommon. Thick armoring of plagioclase by potassium feldspar in a few grains.
15	FB0929b-2	Perthite common.
16	62L-601	Devitrified crystal tuff, shards indistinct. Many sanidine crystals 2-3 mm. No lithics observed.
17	62L-613	No description.
18	63L-41A	No description.
18	63L-41B	Very little pumice, which has a minor fibrous marginal growth lining cavities, and some zeolite as in 63L-41A. Incipient axiolitic devitrification of shards. Groundmass incipiently devitrified, but probably still mostly glass. Moderate disseminated carbonate. No mineral alteration. Plagioclase has alkali feldspar rims, is progressively zoned, and shows extensive embayment in a few crystals. Biotite strongly oxidized.
18	63L-41C	No description.
19	MAT-B-1	Black pumice. Porphyritic in cellular brown glass. Most plagioclase incipiently resorbed or "moth eaten".
19	MAT-B-2	Black pumice.
19	MAT-W-1	White, silky pumice, phenocryst poor. Sparsely porphyritic with flattened tubular pumice in groundmass of glass.

Appendix 2B--continued

Locality number	Sample number	Additional data
19	MAT-W-2	White, silky pumice, phenocryst poor. Total point count = 6000 +/- 200. Perthitic texture in alkali feldspar.
19	MAT-Y-1	Unit C Yellow pumice. Albite twin 20^{o}=An 30; Albite twin 16^{o} = An25. Microperthite strong, plagioclase has shaggy cores mantled by alkali feldspar.
19	MAT-Y-2	Duplicate of MAT-Y-1, total point count = 3000 points, +/-200. Zoned Plagioclase An20-30 by relief; albite twin-14^{o}, An24; second plagioclase albite twin = 0 to 5^{o}, indicies An10-15. Plagioclase has shaggy microperthitic core mantled by alkali feldspar.
19	G612	Quartz latite unit C. Many crystals of perthitic alkali feldspar.
20	SJW-0	Glomerocrysts of plagioclase and biotite, alkali feldspar and sphene and apatite. Abundant perthite; armoring of plagioclase by alkali feldspar. Flattened pumice and gas cavities filled with sheaf-like crystals.
20	SJW-1	Armoring of plagioclase by alkali feldspar. Perthite, less schiller than in alkali feldspar. Jewel-studded opaque with zircon.
20	SJW-2	Glomerocrysts of plagioclase and biotite. Perthite, schiller structure in alkali feldspar. Dust charged groundmass.
20	SJW-3	Glomerocrysts of plagioclase and biotite, clinopyroxene, and apatite. Perthitic texture common in alkali feldspar. Crystal rich. Mafic hypabyssal.
20	SJW-4A	Vitric top. Orthopyroxene rimmed by clinopyroxene. Armoring of andesine by oligoclase.
20	SJW-5	Some calcite alteration.

Appendix 2B--continued

Locality number	Sample number	Additional data
20	SJW-6	Basal vitrophyre.
20	SJW-8	Pink nonwelded basal vitric.
21	EC-2A	Plagioclase is oligoclase or albite-oligoclase.
21	EC-2B	No description.
21	EC-3	No description.
21	EC-4	No description.
21	EC-5	Vapor-phase zone.
21	EC-6	Caprock. Orthopyroxene rimmed with clinopyroxene.
21	EC-6P	Quartz-latitic unit pumice. An40 estimated by relief, indicies An35 (estimate). Large plagioclase resorbed.
21	EC-7	No description.
21	EC-8	Jewel-studded opaques with zircon and apatite.
22	TEA-8	Recrystallized--not caprock. Tridymite, cristobalite, or zeolite alteration of phenocrysts.
22	TEA-16	No description.
22	TEA-22	Granoblastic mosaic in pumice centers. Quartz veinlet. No lithics observed.
22	TEA-48	Recrystallized quartz intergrown with alkali feldspar microlites and laths in groundmass.
22	TEA-49	Some plagioclase grains altered.
23	BBRh	Pink, nonwelded shard base. Zoned perthitic-rimmed alkali feldspar.
23	BBRi	Vitric shard tuff, incipiently welded. Calcite partly replaces glass.

Appendix 2B--continued

Locality number	Sample number	Additional data
23	BBRj-(1)	Incipiently devitrified shard tuff. Fine dust in groundmass. Sparse calcite. Hornblende rimmed with opaques.
23	BBRj-(2)	Fine mosaic lithic and microgranular mosaic lithic.
23	BBRk-(1)	Caprock. Incipient devitrification. Flattened shard tuff. Low birefringence. No calcite.
23	BBRk-(2)	Microgranular mosaic lithic.
23	BBRl	Mosaic lithics.
24	BBRn-(1)	Light brown vitric pumice-lithic tuff. Specks of calcite.
24	BBRo	Vitric shard, pumice, crystal tuff. Some calcite.
25	SB1	Partly devitrified shard-pumice tuff with 5-10 percent crystals. Little flattening.
25	SBn	Calcite in groundmass.
25	FB0056a-1	Incipiently devitrified tuff, shards distinct. Opaque segregations. Glomerocrysts of plagioclase and opaques. Green hornblende jacketed by opaques.
25	FB0056a-2	Similar to FB0056a-1, except one large lithic (hunk of pumice with vapor-phase crystals) which is more devitrified (radiating aggregate) and no shard structure is visible. Rare phenocrysts. Fine-grained mosaic lithic. Green hornblende with opaque jacket.
25	FB0056b-1	Vitric-crystal tuff, no shard structure visible. Fine-grained mosaic lithics. Plagioclase composition variable An10-40 +/-5.
25	FB0056b-2	Vitrophyre caprock. Flattened, compacted shards indistinct.
26	TM-2	Quartz-latitic unit. Zoned plagioclase.

Appendix 2B--continued

Locality number	Sample number	Additional data
27	TM-4b	Oligoclase-andesine cores armored by alkali feldspar, broken. Also Orthopyroxene(?) with rim of clinopyroxene.
27	TM-4c	Oligoclase armored by alkali feldspar.
28	SM-3	Vitrophyre.
28	SM-4	Oligoclase-andesine cores armored by alkali feldspar.
28	SM-5	Oligoclase-andesine armored by alkali feldspar. Minor perthitic inclusions within alkali feldspar. Shoshone Mesa--upper unit vitrophyre.
29	RM-4600B	Quartz embayed, rounded. No sphene. Pumice vitric, with perlitic fractures and scattered trichites.
29	RM-4600C	Plagioclase is oligoclase. Magnetite after clinopyroxene(?).
29	RM-4600D	Pumice and shards show parallel alignment and bending around crystals. Some alkali feldspar corroded.
29	RM-4600E	Pinkish, vapor-phase devitrified upper part. Vapor-phase crystallization.
29	RM-4600F	Light buff, vitric, disseminated shards and bubbles in a glassy matrix which locally is almost entirely opaque oxides. Pumice is tubular and glassy. Biotite fresh. No pyroxene or tschevkinite. Minor zircon and sphene. Alkali feldspar rounded, unaltered, minor schiller, and no coarse perthite. All plagioclase as inclusions in alkali feldspar, and is probably quite Na-rich.
29	RM-4600G	Skyline tuff, pinkish, vapor-phase devitrified upper part. Incipient devitrification vapor-phase zone, radiating crystals lining cavities.

Appendix 2B--continued

Locality number	Sample number	Additional data
30	MM-1	Shards devitrified. Few carbonate veinlets.
30	MM-2	Flattened shards. Devitrified veinlet with calcite.
30	MM-3	Vitric shard tuff. Some calcite alteration, some devitrification.
30	MM-4	Shard groundmass devitrification.
30	MM-5	Porous incipient vapor-phase, microlite-lined cavities. Some calcite alteration.
30	MM-6	Vitric shard-pumice tuff.
31	MM-7	Vitric, nonwelded shard-pumice tuff.
31	MM-8	Flattened shards, partly devitrified. Calcite dust particles. Mosaic lithics.
31	MM-9	Devitrified flattened shards. Some calcite alteration. Mosaic lithics.
31	MM-10	Caprock. Some calcite alteration.
32	7-73-2A	Shard-crystal tuff; incipient devitrification.
32	7-73-2B	Devitrified flattened shard tuff.
32	7-73-2J	Mosaic lithics.
33	7-73-2C	No description.
33	7-73-2E	Vitric shard-crystal tuff. Some calcite alteration. Albite counted as alkali feldspar.
33	7-73-2F	Vague flattened shards. Some calcite alteration.
33	7-73-2G	Devitrified flattened shard-crystal tuff.
33	7-73-2H	Flattened shard devitrified crystal tuff. Mosaic lithic. Abundant calcite and zeolite alteration.

Appendix 2B--continued

Locality number	Sample number	Additional data
34	63C-8	Incipient granophyric pumice tuff. Cryptoperthite on sanidine.
35	81FB-12	Zeolitic. Quartz wormy and slightly resorbed.
36	TO-2F	Pumice flattened. Most plagioclase mantled or replaced by alkali feldspar. No sphene. Very fine grained aggregates and axiolites of alkali feldspar and cristobalite, and coarser tridymite in pumice cavities. Alkali feldspar composition approximately Or50 Ab50 (2V estimate).
36	TO-2G	Upper porphyritic. Pumice and shards flattene. and distorted, contains abundant devitrification products. No sphene. Anorthoclase approximately Ab55 Or45 (2V estimate). Axiolitic and granular intergrowths of alkali feldspar and cristobalite, and possibly some tridymite in pumice cavities.
36	TO-2H	Upper vitrophyre. Pumice flattened. Perlitic fracturing extends through both shards and pumice.
36	TO-4A	Magnetite after biotite, hematite after magnetite. One plagioclase zoned An38-60; other plagioclase zoning An14->An43->An51.
36	TO-5B	Pumice is flattened, shards are aligned and distorted; axiolites of alkali feldspar and cristobolite at margin of pumice cavities.
36	TO-5C	Pumice is flattened, shards are aligned and distorted, and are partly obscured by devitrification products. Axiolites of alkali feldspar and cristobalite at margins of pumice cavities. Anorthoclase Ab65 Or35 +/-.

Appendix 2B--continued

Locality number	Sample number	Additional data
36	TO-5D	Pumice is flattened, shards are aligned and distorted. Axiolitic, plumose, and spherulitic aggregates of alkali feldspar and cristobalite at margins of pumice cavities and throughout the shards. Anorthoclase Ab50 Or35 +\-.
36	TO-5E	Granophyric quartz and alkali feldpar in pumice and lithophysal cavities. Anorthoclase Ab40 Or60(?). Pumice is partly obscured by devitrification products, flattened when seen.
36	TO-5F	Some vapor-phase crystallization(?). Pumice flattened, contains abundant vapor-phase crystallization(?) products. Shards are present as ghosts and are largely obscured by devitrification. Both perthitic and antiperthitic growths occur, and the alkali feldspar may have properties nearly continuous with the plagioclase. Axiolitic and fine-grained aggregates of alkali feldspar and cristobalite in pumice and shards. Anorthoclase Ab76 Or24 +/-4(estimated by 2V).
36	TO-6A	Pumice flattened, contains abundant devitrification products, possibly some vapor-phase crystallization products. Granular masses of tridymite and alkali feldspar in cavities at centers of pumice fragments.
36	TO-6B	Pumice flattened, and distorted, abundant devitrification products. Anorthoclase Ab65 Or35. Spherulites, axiolites, and fine-grained aggregates of tridymite, cristobalite and alkali feldspar in pumice cavities.
37	TO-42H	Pumice is only partly collapsed and some devitrification products within it.
37	TO-42J	Pumice flattened, shards aligned. Quartz is sometimes wormy.

Appendix 2B--continued

Locality number	Sample number	Additional data
37	TO-42K	Lithics with opaque dust around rim just like Tcta (H-12).
37	TO-42P	This rock is an aggregate of unflattened shards and fragments with essentially no devitrification.
37	TO-42R	Shards and pumice are flattened and aligned.
37	TO-42S	Shards and pumice show extreme compaction and alignment.
37	TO-42T	Vapor-phase crystallization. Pumice and shards flattened, but much of the shard structure is obscured by devitrification. Coarse-grained aggregates of devitrification products partly fill open pumice cavities. Sphene, allanite, and hornblende resorbed.
37	TO-43A	Shards slightly flattened or fused, no devitrification is evident. Phenocrysts are scarce.
37	TO-43B	Shards are typical "fat worm type". Devitrification is in part pervasive, in part axiolitic.
37	TO-43C	Shards and pumice flattened and aligned. Devitrification products are abundant, in particular open space crystallization.
38	JD-1	Pumice flattened, shards distorted and partly obscured by devitrification products. Quartz phenocrysts are embayed and have glassy inclusions. Biotite occurs as small pleochroic laths, largely replaced by magnetite; magnetite in sub- to euhedral grains after biotite. Sanidine Or61 Ab39 (x-ray, (201) spacing).

Appendix 2B--continued

Locality number	Sample number	Additional data
38	JD-5	Pumice partly collapsed to uncollapsed and glassy. Shards dispersed, show complete bubble structure, partly aligned and are glassy. Quartz has some glassy inclusions. Sanidine irregular to euhedral with embayments and glassy inclusions. Sanidine mantles plagioclase. Sanidine Or60 Ab40 (x-ray (201) spacing).
38	JD-111A	Pumice and shards are flattened and aligned. Quartz fragments show numerous embayments on broken surfaces. Sanidine, Or70 Ab30(?).
38	JD-111B	Pumice flattened and aligned. Quartz phenocrysts rounded and embayed. Sanidine Or70 Ab30? (by comparison of other alkali feldspar in this cooling unit). Axiolites of cristobalite and alkali feldspar are abundant in pumice cavities.
38	JD-111C	Pumice flattened, shards aligned. Quartz is rounded and embayed. Sanidine Or7 Ab30. Some axiolitic, radial, and fine-grained granular intergrowths of cristobalite and alkali feldspar in pumice cavities.
38	JD-111E	Pumice and shards flattened and aligned. Quartz phenocrysts are embayed and have inclusions. Some sericite muscovite replacing groundmass. Sanidine, Or60 Ab40.
38	JD-111F	Pumice flattened, but shards are well developed. Quartz and feldspars occur as fragmental and rounded phenocrysts.

Appendix 2B--continued

Locality number	Sample number	Additional data
38	JD-111G	Pumice flattened to partly flattened; shards are aligned but show some good cusp shapes. Shards are partly masked by devitrification products. Devitrification products include axiolitic and radiating growths of cristobalite and alkali feldspar; magnetite dust. Quartz occurs as large subhedral bipyramids with some embayments. Alkali feldspar mantles plagioclase and partly replaces plagioclase in some places.
38	JD-112A	Pumice and shards are fused, flattened, and aligned.
38	JD-112B	Lack of abundant pumice and pervasive devitrification has masked all but the faintest trace of pyroclastic textures.
38	JD-112C	Pumice is collapsed and shards aligned, but tube structure is still partly visible. Pumice cavities have relatively large growths of devitrification products. Calcite abundant in pumice cavities.
38	JD-112D	Shards are visible, have fat wormy appearance. No plagioclase.
38	JD-112E	Ghosts of shards present, but devitrification has replaced most shards without respect to boundaries. Little pumice present.
38	JD-112F	Pumice and shards flattened and aligned. Vapor-phase and (or) granophyric crystallization. Calcite veins. Quartz and alkali feldspar intergrowths in pumice cavities. Fine-grained cristobalite(?) and alkali feldspar in matrix.

Appendix 2B--continued

Locality number	Sample number	Additional data
38	JD-112G	Pumice is partly flattened and aligned. Vapor-phase crystallization. No allanite, no sphene. Ab65 Or35. Fine-grained cristobalite(?) and alkali feldspar in matrix; coarse aggregate of alkali feldspar, tridymite(?), cristobalite(?), and quartz in pumice cavities; apatite, magnetite, and possibly another spinel type occur in the matrix. Calcite is common in some large cavities.
39	5896-P2	Argillized. Plagioclase resorbed and wormy. The resorbed plagioclase is confined mainly to nonargillized, cognate lithics or pumice which may be remelted Chocolate Mountain or similar magma-rock unit different from rest of slide. The other plagioclase is good sanidine.
39	5896-P3	Shard-pumice tuff, very porous. Albite twinning at 0^{o} suggests An15. Estimated plagioclase by relief=An30-35.
39	5896-P5	Rhyolitic. Mantling of plagioclase by alkali feldspar.
39	5896-P7	Caprock. Vapor-phase crystallization. Fine albite twin=An10, mantling of alkali feldspar over An20-30. Alkali feldspar mostly sanidine.
39	5896-P7P	Alkali feldspar wormy, resorbed. Pumice flattened. Plagioclase zoned, indistinct twin=Ab15-10.
40	PLO-861-B1	Some pumice shows only incipient devitrification, no vapor-phase minerals. Considerable disseminated carbonate. Biotite fresh with some inclusions of magnetite and zircon. No sphene.

Appendix 2B--continued

Locality number	Sample number	Additional data
40	PLO-861-B2	Pumice locally has very slight incipient devitrification, no vapor-phase minerals. Considerable disseminated carbonate. Biotite fresh with minor inclusions of magnetite and zircon. No sphene.
41	61TNEF	Quartz-latite caprock. Flattened pumice. Calcite in groundmass.
42	11-103-100C	Shards and pumice are flattened, and aligned. Devitrification is strong in groundmass and forms moderately coarse-grained axiolitic and granular aggregates in pumice cavities. Or37 Ab63, x-ray.
42	11-103-100D	Pumice and shards are partly flattened, and aligned. Devitrification products are abundant, form some granular aggregates in pumice cavities. Or37 Ab63, x-ray.
42	11-103-101A	Shards, pumice not flattened nor aligned, but retain most original structures and are dispersed in a vitric groundmass. Sanidine Or65 Ab35.
42	11-103-101B	Shards and pumice partly flattened and aligned. Secondary mineral, probably calcite, is ubiquitous in the glass, and the centers of most pumice fragments have been removed. Phenocrysts are fragmented. Quartz subhedral with numerous deep embayments. Sanidine Or60 Ab40 +\-5.
42	11-103-101C	Pumice fragments show some alignment, shards not flattened. Groundmass is slightly devitrified, individual shards are not.
42	11-103-101D	Pumice flattened and aligned. Devitrification products are abundant, especially in pumice fragments. Quartz phenocrysts have numerous embayments.

Appendix 2B--continued

Locality number	Sample number	Additional data
42	11-103-102A	Pumice flattened. Phenocrysts generally less than 1.5 mm. Quartz euhedral to subhedral phenocrysts and fragments with numerous embayments. Sanidine euhedral to subhedral.
42	11-103-102B	Pumice flattened with spherulites developed within it. Shards obscured by devitrification products.
42	11-103-102C	Pumice slightly flattened partly aligned. Devitrification products are scattered through the groundmass. Phenocrysts are fragmented.
42	11-103-102D	Pumice and shards partly flattened and aligned. Quartz euhedral to subhedral phenocrysts with some embayments. Sphene much more abundant than lower in unit.
42	11-103-102E	Pumice and shards flattened and aligned; devitrification has formed mainly axiolitic structures. Quartz euhedral to subhedral phenocrysts with embayments.
43	SC-2A	Glassy shard-pumice tuff. Lithics with opaque rims.
44	SC-4A	Pumice flattened and contains abundant devitrification products. Shards aligned but partly obscured by devitrification products. Quartz phenocrysts have glassy inclusions and abundant embayments. Specular hematite(?). Radial and fibrous aggregates of cristobalite(?) and alkali feldspar. Some tridymite(?) in pumice cavities.

Appendix 2B--continued

Locality number	Sample number	Additional data
44	SC-4B	Pumice flattened, shards aligned, but show some fine cusp features, and are partly obscured by devitrification. Quartz phenocrysts have embayed margins and glassy inclusions. Radial growths of alkali feldspar and cristobalite and (or) tridymite and tablets of tridymite occupy pumice cavities. Some axiolites of cristobalite and alkali feldspar occur.
44	SC-4C	Pumice flattened, and fused, obscuring some tube structure, and are strongly distorted about phenocrysts. Shards are fused, strongly aligned, and distorted. Quartz phenocrysts have numerous embayments and glassy inclusions. Perthitic schiller common in alkali feldspar. Plagioclase partly replaced by anorthoclase.
44	SC-4D	Pumice flattened, and distorted, and are filled with devitrification products (fine-grained aggregates of cristobalite, and alkali feldspar). Shards aligned, and distorted and many of the shards are axiolitic or have some cross-cutting devitrification products. Quartz phenocrysts with embayments and glassy inclusions. Perthitic schiller common in alkali feldspar. Alkali feldpsar mantles on plagioclase. No pilotaxitic lava seen.
44	SC-4E	Post-caldera(?) tuff. Pumice fragments are flattened, lined with feathery to axiolitic growths of cristobalite and alkali feldspar.

Appendix 2B--continued

Locality number	Sample number	Additional data
44	SC-4F	Pumice and shards are collapsed and fused obscuring most tube structure. Quartz sub- to euhedral phenocrysts with embayments and glassy inclusions. Alkali feldspar (anorthoclase) occurs as rounded and resorbed phenocrysts and fragments, and as mantles on plagioclase. Perthitic schiller common. Clusters of needles in fused pumice.
44	SC-4G	Pumice flattened, and very little tube structure remains. Devitrification products (fine-grained aggregates of cristobalite and alkali feldspar) replace all pumice fragments. Shards are strongly aligned and distorted, and are replaced by devitrification products. Quartz strongly rounded with numerous embayments and glassy inclusions. Alkali feldspar occurs as large subhedral phenocrysts and fragments with some embayments and glassy inclusions; perthitic schiller common.
45	SC-4H	Sericitized, vapor-phase crystallization(?). Pumice fragments are flattened and filled with granular aggregates of devitrification and vapor-phase products. The finer grained parts of the pumice filling include abundant sericite. Shards are partly flattened and distorted, and are only partly devitrified. Quartz is rounded, embayed, and has glassy inclusions. Alkali feldspar (anorthoclase?) mantles plagioclase and some perthitic schiller is present; some rounding and embayment occurs. Plagioclase occurs as lath-like fragments and as cores of anorthoclase; resorption features are common, showing partial replacement by anorthoclase; sericitization occurs in some phenocrysts.

Appendix 2B--continued

Locality number	Sample number	Additional data
46	BD-1	Shard-crystal tuff. Red hematite dust. Minor calcite in pumice. Armoring of alkali feldspar over plagioclase.
46	BD-2	Shard structure vague. Calcite in pumice. Fine mosaic lithic.
46	BD-3	Shard-crystal tuff. Fine and sutured granular mosaic lithic. Jewel-studded opaques. Alkali feldspar armors plagioclase.
46	BD-4	Microperthite. Shard structure faint. Sparse calcite. Incipient vapor-phase crystallization associated with devitrification. Mosaic sutured and microgranular lithic.
46	BD-5	Incipient vapor-phase crystallization. Pumice partly flattened, shard structure visible. Axiolitic texture in groundmass. Jewel-studded opaque.
47	WH-1J	Pumice and shards flattened and distorted. Some perlitic cracks occur. Quartz is rounded, with embayments and glassy inclusions. Alkali feldspar mantles plagioclase. Some embayments and numerous, glassy inclusions of apatite occur in alkali feldspar.
47	WH-1N	Pumice and shards flattened and distorted. Granular and coarse-grained radial aggregates of devitrification products commonly fill pumice cavities. Quartz euhedral to subhedral phenocrysts with embayments and glassy inclusions. Alkali feldspar mantles common on untwinned plagioclase. Biotite partly altered laths.

Appendix 2B--continued

Locality number	Sample number	Additional data
47	WH-1P	Pumice flattened and some coarse granular aggregates of devitrification products occur in some pumice cavities. The shard matrix is not severely affected by devtrification in some areas. Quartz embayed with glassy inclusions. Alkali feldspar subhedral and fragmented phenocrysts with abundant iron oxide; some zoning; mantles plagioclase.
47	WH-1R	Pumice collapsed and distorted, generally fused to a nearly structureless glass. The shards are glassy, strongly aligned and distorted. Quartz embayed and corroded with glassy inclusions. Alkali feldspar mantles plagioclase, occurs as embayed, fragmented phenocrysts with glassy inclusions. Sanidine-albite perthite is present--possibly marginal to the grains.
47	WH-1S	Slightly flattened, vitric pumice and some collapse of some bubble shards is observed. Quartz subhedral to fragmental phenocrysts with embayments and glassy inclusions. Alkali feldspar subhedral and fragmented phenocrysts, and mantles plagioclase.
48	WH-1E	Pumice slightly flattened and shards are distorted at the margins of some phenocrysts. Quartz euhedral to subhedral; grain boundaries embayed, and glassy inclusions are common. Sanidine, Or66 Ab34 (determined by (201) spacing on x-ray diffractometer). Sanidine mantles plagioclase.

Appendix 2B--continued

Locality number	Sample number	Additional data
48	WH-1F	Pumice flattened and distorted near phenocrysts. Pumice filled with devitrification products (plumose aggregates of alkali feldspar, cristobalite, topaz(?)). Ghosts of shards remain as devitrification aggregates obscuring most groundmass structures. Quartz sub- to euhedral with embayments and glassy inclusions. Sanidine mantles plagioclase, Or65 Ab35.
48	WH-1G	Pumice flattened and distorted but some tube structure remains. Devitrification products (cristobalite, alkali feldspar) fill the centers of pumice cavities. Shards represented by weak ghosts and are largely obscured by radial and cross-cutting aggregates of devitrification products. Quartz euhedral to subhedral grains with embayed margins, rounded edges, and glassy inclusions. Sanidine mantles on plagioclase, Or65 Ab35 +\-. Hematite after magnetite. Granular intergrowth of quartz and feldspar in pumice cavities. Topaz(?).
48	WH-1H	Pumice flattened, filled with spherulitic and axiolitic devitrification products. Some shard ghosts remain and show little distortion of the original structure. Many shards are obliterated by devitrification products. Quartz euhedral to subhedral with embayments and glassy inclusions. Sanidine sub to euhedral, Or65+ Ab35-. Biotite after hematite.
48	WH-1M	Lithics common. Quartz and alkali feldspar embayed.
48	WH-1V	Pumice and shards partly collapsed. Quartz fragmental with some embayed. Some sanidine with embayments. Spherulitic growths of alkali feldspar and cristobalite.

Appendix 2B--continued

Locality number	Sample number	Additional data
49	O-411	Pumice and shards flattened. Sanidine Or62 Ab38 determined by x-ray (201) spacings. Devitrification products radial and plumose alkali feldspar equigranular aggregates of alkali feldspar and cristobalite.
49	O-414	Tuff of Transvaal. Hematite after magnetite; magnetite after rock fragments.
49	O-415	Pumice flattened, filled with fairly coarse aggregate of devitrification products (alkali feldspar and cristobalite). Shard structures are faint ghosts in dirty groundmass. Some spherulites present in pumice fragments. Quartz is rounded with glassy inclusions and embayments. Alkali feldspar with some glassy inclusions. Biotite -> magnetite.
49	O-416	Pumice flattened. Shards obscured by spherulites and pervasive devitrification. Quartz subhedral with some embayments and glassy inclusions. Alkali feldspar mantles plagioclase. Biotite occurs as pleochroic laths partly replaced by magnetite. Magnetite after biotite. Aggregates of cristobalite and alkali feldspar occur as devitrification products.
49	O-417	Pumice flattened but almost obscured by devitrification. Only ghosts and shadows of shards remain. Quartz euhedral to subhedral with embayments and glassy inclusions. Alkali feldspar mantles plagioclase. Biotite replaced by magnetite and hematite. Critobalite and alkali feldspar occur as devitrification products.

Appendix 2B--continued

Locality number	Sample number	Additional data
49	O-418	Pumice strongly flattened and loaded with devitrification products (feathery, spherulitic and granular aggregates of cristobalite, alkali feldspar, and tridymite). Quartz subhedral with embayments and glassy inclusions. Alkali feldspar with some perthitic growths, mantles plagioclase.
49	O-419	Pumice flattened, severely in some cases, and contains axiolitic and spherulitic structures. The shards are axiolitic in part, obscured in part, but do not seem too badly distorted. Quartz subhedral to euhedral with embayments and glassy inclusions. Some plagioclase grains strongly embayed with glassy inclusions. Feathery and radial aggregates of alkali feldspar and cristobalite occur as devitrification products.
50	TM5888B	No description.
51	TM5888C	Rhyolitic Ammonia Tanks; Sargent found chovkinite in Parachute Canyon Rhyolite.
52	TM6089B	No description.
52	TM6185G	Piapi Canyon, Rainier Mesa lower cooling unit. 23.8 percent estimated porosity.
52	TM6189B	No description.
52	TM6189C	Xenoliths within xenoliths. Nearly all with tuff. Homogeneous glassy pumice (or rhyolite).
53	TM6894A	Plagioclase largely oligoclase. No sphene observed.
53	TM6894B	Plagioclase largely oligoclase. No sphene observed.
54	TM7090I	Some silicification.

Appendix 2B--continued

Locality number	Sample number	Additional data
55	TM8338A	Pumice, irregular to spherulitic. Biotite -> opaque. Rock has a mottled appearance due to light colored pumice and numerous phenocrysts.
55	TM8338B	Contains foreign pumice more basic than the rest of the rock. Some wormy plagioclase. Biotite -> opaque. Rock grades in thin section from dominantly intermediate to dominantly silicic areas. Intermediate shows devitrification but is nearly opaque; silicic areas show finely crystalline, fibrous, crudely spherulitic devitrification.
56	TM8692	Good rhyolitic Ammonia Tanks. Plagioclase(?) poor twinning, albite-oligoclase(?).
57	TM8795	Much plagioclase around An30. No sphene. Zircon small and scattered.
58	TW8-T3	Plagioclase=andesine; a few armored with alkali feldspar. Jewel-studded opaques.
59	62-ENH-11	Pumice completly glassy. Groundmass mostly dark opaque material; shards show microcrystalline devitrification. Plagioclase strongly embayed, wormy. Alkali feldspar rims on some crystals, with irregular interfingering relationships with plagioclase. Alkali feldspar has a few strongly embayed crystals.
60	RK-62-1	Shards and pumice finely crystalline, and devitrified. Groundmass partly glassy, partly granular, and microcrystalline. Stained section. A few vesicles filled with zeolite(?). Alkali feldspar with minor schiller structure, rims a few plagioclases, has minor embayments and fragmentation. Plagioclase zoned, some wormy.

Appendix 2B--continued

Locality number	Sample number	Additional data
61	RK-62-3	Stained section. Shards and pumice are devitrified, some pumice spherulitic. Groundmass is opaque--can't determine whether glassy or due to abundant disseminated, chocolate-brown material. Plagioclase with progressive zoning, some grains strongly embayed; no alkali feldspar rims. Some disseminated carbonate.
62	RK-62-11	Visible shard bubbles and bifurcating shards. Pumice tubular, unflattened. Groundmass glassy to microcrystalline, shards generally more glassy. Stained thin section. Biotite partly bleached and oxidized. Some flow-banded lithics. Quartz rounded, and partly embayed.
62	RK-62-12	Groundmass and pumice glassy, no incipient devitrification. Shards not visible, but pumice flattened and attenuated, and banded structure around crystals suggests dense welding. Plagioclase: some wormy and strongly embayed.
63	W8(=8-M)	Falcon Canyon (pumice). Mafic pumice appears to have been crushed during solidification (crushed, rehealed, rewelded). Larger plagioclase crystals resorbed. Plagioclase mantled by alkali feldspar.
63	8Tpr-1(1)	Tuff of Falcon Canyon. Absence of mantling of plagioclase by orthoclase noted. Glomerocrysts of plagioclase and biotite, also plagioclase and augite. Zircon and apatite around opaques and biotite.
63	8SC	Falcon Canyon mafic pumice. Porphyritic to glomeroporphyritic with light-brown pumice groundmass-tubules flattened and contorted. Feldspar resorbed. Plagioclase by relief = An30-35, albite twin = An32, estimated plagioclase zoned An35-25.

Appendix 2B--continued

Locality number	Sample number	Additional data
63	8Tprim	Falcon Canyon dark mafic scoria pumice. Plagioclase by relief An40-30; plagioclase twin 15^{o} maximum-An25.
63	TW8-135	Vitric caprock. Glomerocrysts of plagioclase and biotite.
63	TW-8-1080	Caprock.
64	8-I-1	Well 8, xenolith in Falcon Canyon. Estimated porosity 35-40 percent. Plagioclase-oligoclase, some andesine, a few zoned andesine->oligoclase-albite.
64	8-I-2	Piapi Canyon. Well 8, xenolith in Falcon Canyon. Porosity estimated at 35-40 percent. Plagioclase largely albite-oligoclase.
65	8Tpr1-(2)	Tuff of Falcon Canyon. Glomerocrysts of plagioclase and biotite. Calcite in parts of groundmass. Orthopyroxene rimmed by clinopyroxene. No sphene observed. Zircon and apatite around biotite and opaques.
66	ENH62-40	Glomerocrysts of sphene and opaques, sphene and biotite,pyroxene and opaque, pyroxene and plagioclase, zircon and plagioclase. One quartz with undulating extinction. Diamond shaped zircon. Points don't include large pumice fragment.

APPENDIX 2C

Locations of Nevada Test Site outcrop sample modes
(See pl. 1 for locality numbers)

Appendix 2C

Locality number	Sample number	Sample location description
1	40V-12	Thirsty Canyon quadrangle, in saddle east of Oasis Mountain at base of section, 37°2'30", 116°43'20".
2	OV-A	Thirsty Canyon quadrangle, Oasis Valley section, 37°0'30", 116°43'20".
2	OV-B	Thirsty Canyon quadrangle, Oasis Valley section, 37°0'30", 116°43'20".
3	OV-C	Thirsty Canyon quadrangle, Oasis Valley section, 37°0'45", 116°43'20".
4	WJC-2-64	Thirsty Canyon SE quadrangle, west Cat Canyon, 37°3'10", 116°31'50".
4	WJC-4-64	Thirsty Canyon SE quadrangle, west Cat Canyon, 37°3'10", 116°31'50".
4	WJC-6-64	Thirsty Canyon SE quadrangle, west Cat Canyon, 37°3'10", 116°31'50".
5	WJC-15-69	Thirsty Canyon SE quadrangle, Transvaal Hills, north end, west flank, 37°1'25", 116°35'20".
5	WJC-16-69	Thirsty Canyon SE quadrangle, Transvaal Hills, north end, west flank, 37°1'25", 116°35'20".
5	WJC-20-69	Thirsty Canyon SE quadrangle, Transvaal Hills, north end, west flank, 37°1'25", 116°35'20".
5	WJC-21-69	Thirsty Canyon SE quadrangle, Transvaal Hills, north end, west flank, 37°1'25", 116°35'20".
5	WJC-22-69	Thirsty Canyon SE quadrangle, Transvaal Hills, north end, west flank, 37°1'25", 116°35'20".

Appendix 2C--continued

Locality number	Sample number	Sample location description
6	WJC-23-69	Bare Mountain 15' quadrangle, north of Beatty, 2 to 3 miles and one half mile west of U.S. Highway 95, 36°56'20, 116°44'.
7	67FB-1A	Topopah Spring NW quadrangle, type stop in bottom of Yucca Wash, 36°53'40", 116°26'20".
7	67FB-1B	Topopah Spring NW quadrangle, type stop in bottom of Yucca Wash, 36°53'40", 116°26'20".
8	67FB-2B	Topopah Spring NW quadrangle, Pinyon Pass east area, 36°56'08", 116°27'42".
8	67FB-2C	Topopah Spring NW quadrangle, Pinyon Pass east area, 36°56'08", 116°27'42".
8	67FB-2D	Topopah Spring NW quadrangle, Pinyon Pass east area, 36°56'08", 116°27'42".
9	67FB-3B	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	67FB-3C	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	67FB-3D1	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	67FB-3D2	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	67FB-3E1	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	67FB-3E2	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	TCRB-1	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".

Appendix 2C--continued

Locality number	Sample number	Sample location description
9	TCRC-V	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	TCRD-UV	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	TCRD-BV	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	TCTB-1	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	TCTB-2A	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	TCTB-2B	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	TCTB-3	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	TCTB-4	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	H-12	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	H-14	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	H-15	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
9	H-17	Topopah Spring NW quadrangle, Claim Canyon section, 36°55'30", 116°28'50".
10	67FB-9D	Springdale quadrangle, bottom of fault valley east of Springdale, 37°02', 116°45'.

Appendix 2C--continued

Locality number	Sample number	Sample location description
10	67FB-9E	Springdale quadrangle, bottom of fault valley east of Springdale, 37°02', 116°45'.
11	67FB-10B	Thirsty Canyon SE quadrangle, west Cat Canyon, 37°3'12", 116°31'53".
12	75FB-39	Chloride Cliff quadrangle, 1 mile south of Hill 3766, 36°42'28", 116°48'39".
12	75FB-40B	Chloride Cliff quadrangle, 36°42'28", 116°48'39".
13	75FB-36B	Chloride Cliff quadrangle, one half mile north of Hill 2929, 36°44'04", 116°45'45".
13	75FB-37A	Chloride Cliff quadrangle, 36°44'04", 116°45'45".
14	75FB-38A	Chloride Cliff quadrangle, one half mile southwest of Hill 3295, southwest side Amargosa Desert, 36°44'08", 116°46'40".
14	75FB-38D	Chloride Cliff quadrangle, 36°44'08", 116°46'40".
15	FB0929b-1	Paiute Ridge quadrangle, Carbonate Ridge, 37°4'50", 115°56'15".
15	FB0929b-2	Paiute Ridge quadrangle, Carbonate Ridge, 37°4'50", 115°56'15".
16	62L-601	Bare Mountain 15' quadrangle, 36°55'30", 116°39'.
17	62L-613	Thirsty Canyon SE quadrangle, 37°00'23", 116°35'.
18	63L-41A	Thirsty Canyon SE quadrangle, 37°02'10", 116°35'18".
18	63L-41B	Thirsty Canyon SE quadrangle, 37°02'10", 116°35'18".
18	63L-41C	Thirsty Canyon SE quadrangle, 37°02'10", 116°35'18"
19	MAT-B-1	Silent Butte quadrangle, Pahute Mesa, one half mile southeast of drill hole PM #1, 37°16'15", 116°24'04".

Appendix 2C--continued

Locality number	Sample number	Sample location description
19	MAT-B-2	Silent Butte quadrangle, Pahute Mesa, one half mile southeast of drill hole PM #1, $37^{\circ}16'15''$, $116^{\circ}24'04''$.
19	MAT-W-1	Silent Butte quadrangle, Pahute Mesa, one half mile southeast of drill hole PM #1, $37^{\circ}16'15''$, $116^{\circ}24'04''$.
19	MAT-W-2	Silent Butte quadrangle, Pahute Mesa, one half mile southeast of drill hole PM #1, $37^{\circ}16'15''$, $116^{\circ}24'04''$.
19	MAT-Y-1	Silent Butte quadrangle, Pahute Mesa, one half mile southeast of drill hole PM #1, $37^{\circ}16'15''$, $116^{\circ}24'04''$.
19	MAT-Y-2	Silent Butte quadrangle, Pahute Mesa, one half mile southeast of drill hole PM #1, $37^{\circ}16'15''$, $116^{\circ}24'04''$.
19	G612	Silent Butte quadrangle, Hill 6612, one half mile southeast of drill hole PM #1, $37^{\circ}16'15''$, $116^{\circ}24'04''$.
20	SJW-0	Scotty's Junction quadrangle, 5 miles southwest of Scotty's Junction, $37^{\circ}15'$, $117^{\circ}7'10''$.
20	SJW-1	Scotty's Junction quadrangle, 5 miles southwest of Scotty's Junction, $37^{\circ}15'$, $117^{\circ}7'10''$.
20	SJW-2	Scotty's Junction quadrangle, 5 miles southwest of Scotty's Junction, $37^{\circ}15'$, $117^{\circ}7'10''$.
20	SJW-3	Scotty's Junction quadrangle, 5 miles southwest of Scotty's Junction, $37^{\circ}15'$, $117^{\circ}7'10''$.
20	SJW-4A	Scotty's Junction quadrangle, 5 miles southwest of Scotty's Junction, $37^{\circ}15'$, $117^{\circ}7'10''$.
20	SJW-5	Scotty's Junction quadrangle, 5 miles southwest of Scotty's Junction, $37^{\circ}15'$, $117^{\circ}7'10''$.

Appendix 2C--continued

Locality number	Sample number	Sample location description
20	SJW-6	Scotty's Junction quadrangle, 5 miles southwest of Scotty's Junction, 37°15', 117°7'10".
20	SJW-8	Scotty's Junction quadrangle, 5 miles southwest of Scotty's Junction, 37°15', 117°7'10".
21	EC-2A	Ammonia Tanks quadrangle, East Cummings Canyon section, 37°12'10", 116°21'35".
21	EC-2B	Ammonia Tanks quadrangle, East Cummings Canyon section, 37°12'10", 116°21'35".
21	EC-3	Ammonia Tanks quadrangle, East Cummings Canyon section, 37°12'10", 116°21'35".
21	EC-4	Ammonia Tanks quadrangle, East Cummings Canyon section, 37°12'10", 116°21'35".
21	EC-5	Ammonia Tanks quadrangle, East Cummings Canyon section, 37°12'10", 116°21'35".
21	EC-6	Ammonia Tanks quadrangle, East Cummings Canyon section, 37°12'10", 116°21'35".
21	EC-6P	Ammonia Tanks quadrangle, East Cummings Canyon section, 37°12'10", 116°21'35".
21	EC-7	Ammonia Tanks quadrangle, East Cummings Canyon section, 37°12'5", 116°21'30".
21	EC-8	Ammonia Tanks quadrangle, East Cummings Canyon section, 37°12'5", 116°21'30".
22	TEA-8	Thirsty Canyon SE quadrangle, west wall of caldera, 37°3', 116°35'.
22	TEA-16	Thirsty Canyon SE quadrangle, west wall of caldera, 37°3', 116°35'.
22	TEA-22	Thirsty Canyon SE quadrangle, west wall of caldera, 37°3', 116°35'.

Appendix 2C--continued

Locality number	Sample number	Sample location description
22	TEA-48	Thirsty Canyon SE quadrangle, west wall of caldera, 37°3', 116°35'.
22	TEA-49	Thirsty Canyon SE quadrangle, west wall of caldera, 37°3', 116°35'.
23	BBRh	Paiute Ridge quadrangle, east side Carbonate Ridge, 37°05', 115°55'40".
23	BBRi	Paiute Ridge quadrangle, east side Carbonate Ridge, 37°05', 115°55'40".
23	BBRj-(1)	Paiute Ridge quadrangle, east side Carbonate Ridge, 37°05', 115°55'40".
23	BBRj-(2)	Paiute Ridge quadrangle, east side Carbonate Ridge, 37°05', 115°55'40".
23	BBRk-(1)	Paiute Ridge quadrangle, east side Carbonate Ridge, 37°05', 115°55'40".
23	BBRk-(2)	Paiute Ridge quadrangle, east side Carbonate Ridge, 37°05', 115°55'40".
23	BBRl	Paiute Ridge quadrangle, east side Carbonate Ridge, 37°05', 115°55'40".
24	BBRn-(1)	Paiute Ridge quadrangle, east side Carbonate Ridge, 37°05', 115°55'30".
24	BBRo	Paiute Ridge quadrangle, east side Carbonate Ridge, 37°05', 115°55'30"
25	SB1	Paiute Ridge quadrangle, Slanted Buttes, 37°6', 115°57'50".
25	SBn	Paiute Ridge quadrangle, Slanted Buttes, 37°6', 115°57'50".
25	FB0056a-1	Paiute Ridge quadrangle, Slanted Buttes, 37°6', 115°57'50".
25	FB0056a-2	Paiute Ridge quadrangle, Slanted Buttes, 37°6', 115°57'50".

Appendix 2C--continued

Locality number	Sample number	Sample location description
25	FB0056b-1	Paiute Ridge quadrangle, Slanted Buttes, 37°6', 115°57'50".
25	FB0056b-2	Paiute Ridge quadrangle, Slanted Buttes, 37°6', 115°57'50".
26	TM-2	Buckboard Mesa quadrangle, southeast corner, 37°, 116°15'.
27	TM-4b	Topopah Spring quadrangle, mouth Piapi Canyon, 36°59', 116°15'.
27	TM-4c	Topopah Spring quadrangle, mouth Piapi Canyon, 36°59', 116°15'.
28	SM-3	Mine Mountain quadrangle, top of Shoshone Mesa, 36°59'40", 116°13'15".
28	SM-4	Mine Mountain quadrangle, top of Shoshone Mesa, 36°59'40", 116°13'15".
28	SM-5	Mine Mountain quadrangle, top of Shoshone Mesa, 36°59'40", 116°13'15".
29	RM-4600B	Rainier Mesa quadrangle, Area 14 tunnels, 37°13'20", 116°09'30".
29	RM-4600C	Rainier Mesa quadrangle, Area 14 tunnels, 37°13'20", 116°09'30".
29	RM-4600D	Rainier Mesa quadrangle, Area 14 tunnels, 37°13'20", 116°09'30".
29	RM-4600E	Rainier Mesa quadrangle, Area 14 tunnels, 37°13'20", 116°09'30".
29	RM-4600F	Rainier Mesa quadrangle, Area 14 tunnels, 37°13'20", 116°09'30".
29	RM-4600G	Rainier Mesa quadrangle, Area 14 tunnels, 37°13'20", 116°09'30".
30	MM-1	Plutonium Valley quadrangle, Massachusetts Mountain section, speciman #1, 14 feet above base unit 1, 36°53'07", 115°59'28".
30	MM-2	Plutonium Valley quadrangle, Massachusetts Mountain section, speciman #2, 45 feet above base of unit 1, 36°53'07", 115°59'28".

Appendix 2C--continued

Locality number	Sample number	Sample location description
30	MM-3	Plutonium Valley quadrangle, Massachusetts Mountain Section, speciman #3, 30 feet above base of unit 2, 36°53'07", 115°59'28".
30	MM-4	Plutonium Valley quadrangle, Massachusetts Mountain section, speciman #4, 60 feet above base unit 2, 36°53'07", 115°59'28".
30	MM-5	Plutonium Valley quadrangle, Massachusetts Mountain section, speciman #5, 150 feet above base of unit 2, 36°53'07", 115°59'28".
30	MM-6	Plutonium Valley quadrangle, Massachusetts Mountain section, speciman #6, 5 feet above base unit 3-vitric top, 36°53'07", 115°59'28".
31	MM-7	Plutonium Valley quadrangle, Massachusetts Mountain section, speciman #7, 5 feet above base unit 5, 36°53'07", 115°59'23".
31	MM-8	Plutonium Valley quadrangle, Massachusetts Mountain section, 12 feet above base of unit 5, 36°53'07", 115°59'23".
31	MM-9	Plutonium Valley quadrangle, Massachusetts Mountain section, 100 feet above base of unit 5, 36°53'07", 115°59'23".
31	MM-10	Plutonium valley quadrangle, Massachusetts Mountain section, top of unit 5, top of exposed section, 36°53'07", 115°59'23".
32	7-73-2A	Yucca Lake quadrangle, CP-Hogback section, unit 1, 26 feet above base, 36°55'50", 116°2'5".
32	7-73-2B	Yucca Lake quadrangle, CP-Hogback section, unit 2, 93 feet above base of section, 36°55'50", 116°2'5".
32	7-73-2J	Yucca Lake quadrangle, CP-Hogback section, unit 3, 10 feet above base, and 166 feet above base of section, 36°55'50", 116°2'5".

Appendix 2C--continued

Locality number	Sample number	Sample location description
33	7-73-2C	Yucca Lake quadrangle, CP hogback section, unit 3, speciman taken 260 feet above base section, and 10 feet below top unit 3, 36°55'45", 116°2'15".
33	7-73-2E	Yucca Lake quadrangle, C-P Hogback section, unit 4, speciman taken 5 feet above base (275 feet above base section), 36°55'45", 116°2'15".
33	7-73-2F	Yucca Lake quadrangle, C-P Hogback section, unit 4, speciman taken at 312 feet above base, or 10 feet below top of unit, 36°55'45", 116°2'15".
33	7-73-2G	Yucca Lake quadrangle, C-P Hogback section, unit 5, 15 feet above base of unit, 337 feet above base of section, 36°55'45", 116°2'15".
33	7-73-2H	Yucca Lake quadrangle, C-P Hogback section, unit 5, 405 feet above base section, or 52 feet below top, 36°55'45", 116°2'15".
34	63C-8	Trail Ridge quadrangle, 37°21'20", 116°30'42".
35	81FB-12	Topopah Spring NW quadrangle, bottom of canyon that drains southeast into Fortymile Wash, 2 to 3 miles south of VE29a-2, 36°55'38", 116°23'38".
36	TO-2F	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".
36	TO-2G	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".
36	TO-2H	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".
36	TO-4A	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".

Appendix 2C--continued

Locality number	Sample number	Sample location description
36	TO-5B	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".
36	TO-5C	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".
36	TO-5D	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".
36	TO-5E	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".
36	TO-5F	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".
36	TO-6A	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".
36	TO-6B	Topopah Spring quadrangle, Topopah Spring section, 36°56'35", 116°15'55".
37	TO-42H	Topopah Spring NW quadrangle, Yucca Mountain section, 36°53'55", 116°28'.
37	TO-42J	Topopah Spring NW quadrangle, Yucca Mountain section, 36°53'55", 116°28'.
37	TO-42K	Topopah Spring NW quadrangle, Yucca Mountain section, 36°53'55", 116°28'.
37	TO-42P	Topopah Spring NW quadrangle, Yucca Mountain section, 36°53'55", 116°28'.
37	TO-42R	Topopah Spring NW quadrangle, Yucca Mountain section, 36°53'55", 116°28'.
37	TO-42S	Topopah Spring NW quadrangle, Yucca Mountain section, 36°53'55", 116°28'.

Appendix 2C--continued

Locality number	Sample number	Sample location description
37	TO-42T	Topopah Spring NW quadrangle, Yucca Mountain section, 36°53'55", 116°28'.
37	TO-43A	Topopah Spring NW quadrangle, Yucca Mountain section, 36°53'55", 116°28'.
37	TO-43B	Topopah Spring NW quadrangle, Yucca Mountain section, 36°53'55", 116°28'.
37	TO-43C	Topopah Spring NW quadrangle, Yucca Mountain section, 36°53'55", 116°28'.
38	JD-1	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-5	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-111A	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-111B	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-111C	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-111E	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-111F	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-111G	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-112A	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-112B	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-112C	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-112D	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-112E	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".

Appendix 2C--continued

Locality number	Sample number	Sample location description
38	JD-112F	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
38	JD-112G	Mine Mountain quadrangle, Jackass Divide, 36°53'09", 116°11'47".
39	5896-P2	Topopah Spring quadrangle, Pinyon Pass area, 36°56'25", 116°28'.
39	5896-P3	Topopah Spring quadrangle, Pinyon Pass area, 36°56'25", 116°28'.
39	5896-P5	Topopah Spring quadrangle, Pinyon Pass area, 36°56'25", 116°28'.
39	5896-P7	Topopah Spring quadrangle, Pinyon Pass area, 36°56'25", 116°28'.
39	5896-P7P	Topopah Spring quadrangle, Pinyon Pass area, 36°56'25", 116°28'.
40	PLO-861-B1	Paiute Ridge quadrangle, 37°06'40", 115°56'.
40	PLO-861-B2	Paiute Ridge quadrangle, 37°06'40", 115°56'.
41	61TNEF	Oak Spring quadrangle, southeast corner, Ballon Hill, 37°07'30", 116°0'40".
42	11-103-100C	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".
42	11-103-100D	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".
42	11-103-101A	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".
42	11-103-101B	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".
42	11-103-101C	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".
42	11-103-101D	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".

Appendix 2C--continued

Locality number	Sample number	Sample location description
42	11-103-102A	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".
42	11-103-102B	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".
42	11-103-102C	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".
42	11-103-102D	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".
42	11-103-102E	Mine Mountain quadrangle, south Mine Mountain, 36°57'38", 116°09'08".
43	SC-2A	Topopah Spring quadrangle, Spring Canyon section, 36°56'35", 116°20'
44	SC-4A	Topopah Spring quadrangle, Spring Canyon section, 36°56'40", 116°19'30".
44	SC-4B	Topopah Spring quadrangle, Spring Canyon section, 36°56'40", 116°19'30".
44	SC-4C	Topopah Spring quadrangle, Spring Canyon section, 36°56'35", 116°19'30".
44	SC-4D	Topopah Spring quadrangle, Spring Canyon section, 36°56'35", 116°19'30".
44	SC-4E	Topopah Spring quadrangle, Spring Canyon section, 36°56'35", 116°19'30".
44	SC-4F	Topopah Spring quadrangle, Spring Canyon section, 36°56'35", 116°19'30".
44	SC-4G	Topopah Spring quadrangle, Spring Canyon section, 36°56'35", 116°19'30".
45	SC-4H	Topopah Spring quadrangle, Spring Canyon section, 36°56'35", 116°19'40".

ppendix 2C--continued

Locality number	Sample number	Sample location description
46	BD-1	Big Dune quadrangle, southern Crater Flat, 36°44'39", 116°33'.
46	BD-2	Big Dune quadrangle, southern Crater Flat, 36°44'39", 116°33'.
46	BD-3	Big Dune quadrangle, southern Crater Flat, 36°44'39", 116°33'.
46	BD-4	Big Dune quadrangle, southern Crater Flat, 36°44'39", 116°33'.
46	BD-5	Big Dune quadrangle, southern Crater Flat, 36°44'39", 116°33'
47	WH-1J	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'28".
47	WH-1N	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'28".
47	WH-1P	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'28".
47	WH-1R	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'28".
47	WH-1S	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'28".
48	WH-1E	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'35".
48	WH-1F	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'35".
48	WH-1G	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'35".
48	WH-1H	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'35".
48	WH-1M	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'35".

Appendix 2C--continued

Locality number	Sample number	Sample location description
48	WH-1V	Topopah Spring quadrangle, Wild Horse Canyon, 36°58'30", 116°15'35".
49	O-411	Mine Mountain quadrangle, Barren Butte, 36°53'40", 116°07'45".
49	O-414	Mine Mountain quadrangle, Barren Butte, 36°53'40", 116°07'45".
49	O-415	Mine Mountain quadrangle, Barren Butte, 36°53'40", 116°07'45".
49	O-416	Mine Mountain quadrangle, Barren Butte, 36°53'40", 116°07'45".
49	O-417	Mine Mountain quadrangle, Barren Butte, 36°53'40", 116°07'45".
49	O-418	Mine Mountain quadrangle, Barren Butte, 36°53'40", 116°07'45".
49	O-419	Mine Mountain quadrangle, Barren Butte, 36°53'40", 116°07'45".
50	TM5888B	Scrugham Peak quadrangle, Piapi Canyon, caldera moat, north of moat rhyolite, 37°11', 116°28'.
51	TM5888C	Scrugham Peak quadrangle, 37°11'20", 116°27'50".
52	TM6089B	Scrugham Peak quadrangle, Piapi Canyon, 37°12', 116°27'.
52	TM6185G	Scrugham Peak quadrangle, Pahute Mesa, 37°13', 116°27'.
52	TM6189B	Scrugham Peak quadrangle, Piapi Canyon, 37°12', 116°27'.
52	TM6189C	Scrugham Peak quadrangle, Piapi Canyon, 37°12', 116°27'.
53	TM6894A	Scrugham Peak quadrangle, Pahute Mesa, Piapi Canyon, 37°13', 116°26'.
53	TM6894B	Scrugham Peak quadrangle, Pahute Mesa, Piapi Canyon, 37°13', 116°26'.
54	TM7090I	Scrugham Peak quadrangle, inside caldera, 37°11'45", 116°25'48".

Appendix 2C--continued

Locality number	Sample number	Sample location description
55	TM8338A	Timber Mountain quadrangle, Cat Canyon near road, $37^{o}03'03''$, $116^{o}22'50''$.
55	TM8338B	Timber Mountain quadrangle, Cat Canyon near road, $37^{o}03'03''$, $116^{o}22'50''$.
56	TM8692	Ammonia Tanks quadrangle, Piapi Canyon, south face Pahute Mesa, $37^{o}12'$, $116^{o}22'$.
57	TM8795	Ammonia Tanks quadrangle, Piapi Canyon, Pahute Mesa near south face, $37^{o}13'$, $116^{o}20'$.
58	TW8-T3	Ammonia Tanks quadrangle, Piapi Canyon, $37^{o}08'$, $116^{o}18'$.
59	62-ENH-11	Ammonia Tanks quadrangle, $37^{o}11'30''$, $116^{o}20'13''$.
60	RK-62-1	Ammonia Tanks quadrangle, $37^{o}08'25''$, $116^{o}16'50''$.
61	RK-62-3	Ammonia Tanks quadrangle, $37^{o}09'15''$, $116^{o}17'$.
62	RK-62-11	Ammonia Tanks quadrangle, top of Pahute Mesa, $37^{o}12'$, $116^{o}19'40''$.
62	RK-62-12	Ammonia Tanks quadrangle, top of Pahute Mesa, $37^{o}12'$, $116^{o}19'40''$.
63	W8(=8-M)	Ammonia Tanks quadrangle, Falcon Canyon, test well 8 locality, $37^{o}09'53''$, $116^{o}17'22''$.
63	8SC	Ammonia Tanks quadrangle, Falcon Canyon, test well 8 locality, $37^{o}09'53''$, $116^{o}17'22''$.
63	8Tpr-1(1)	Ammonia Tanks quadrangle, test well 8 locality, $37^{o}09'53''$, $116^{o}17'22''$.
63	8Tprim	Ammonia Tanks quadrangle, Falcon Canyon, test well 8 locality, $37^{o}09'53''$, $116^{o}17'22''$.
63	TW8-135	Ammonia Tanks quadrangle, Falcon Canyon, test well 8 locality, 135 foot depth, $37^{o}09'53''$, $116^{o}17'22''$.

Appendix 2C--continued

Locality number	Sample number	Sample location description
63	TW-8-1080	Ammonia Tanks quadrangle, Falcon Canyon, gully below test well 8, 37°09'53", 116°17'22".
64	8-I-2	Ammonia Tanks quadrangle, test well 8 area, 37°10', 116°18'.
64	8-I-1	Ammonia Tanks quadrangle, test well 8 area, 37°10', 116°18'.
65	8Tpr1-(2)	Ammonia Tanks quadrangle, Falcon Canyon, test well 8 locality, 1000 feet downstream in canyon, 37°09'45", 116°17'38".
66	ENH62-40	Ammonia Tanks quadrangle, Falcon Canyon, test well 8 locality, 37°09'45", 116°17'38".

APPENDIX 3

Published sample modes
(Explanation of symbols under Database Format, p. 8)

Appendix 3--Table 1
Modified from Quinlivan and Byers, 1977

Loc	Sample number	Fm, Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts Qtz (%)	Felsic Phenocrysts AK-F (%)	Felsic Phenocrysts Plag (%)	Felsic Phenocrysts Plag comp	Fels size (mm)
67	WJC-176-62	TM,AT,LW	DW,C,T		1286				3.3	15.6	9.6		
68	WJC-104-62	TM,AT,LW	DW,C,T		1510				0.4	13.4	9.0		
69	WJC-48-62	TM,AT,LW	DW,C,T		1401				4.9	17.9	4.4		
70	WJC-181-62	TM,AT,LW	DW,C,T		1394				6.2	14.4	6.3		
71	WJC-100-62	TM,AT,LW	DW,C,T		1963				4.5	12.2	2.7		
72	WJC-60-62	TM,AT,LW	PW,C,T		1668				4.8	12.7	4.3		
73	SL 62 62	TM,AT,LW	DW,C,T		5000				4.5	11.8	2.2		
74	WJC-116-62	TM,AT,LW	DW,C,T		1793				4.6	19.3	2.8		
75	WJC-56-62	TM,AT,LW	PW,C,T		1557				4.9	17.2	2.6		
76	WJC-54-62	TM,AT,LW	PW,C,T		2663				3.2	12.6	2.3		
77	WJC-112-62	TM,AT,LW	V		2160				3.1	12.8	1.7		
77	WJC-114-62	TM,AT,LW	DW,C,T		2243				5.2	10.7	1.3		
72	WJC-63-62	TM,AT,UP	DW,C,T		1224				1.4	22.7	14.0		
78	WJC-37-63	TM,AT,UP	DW,C,T		1000				1.7	33.6	10.8		
76	WJC-78-62	TM,AT,UP	DW,C,T		1021				1.3	25.6	8.7		
76	WJC-79-62	TM,AT,UP	DW,C,T		1041				1.4	25.6	8.7		
79	WJC-146-62	TM,AT,UP	V		2110				1.7	17.5	6.6		
80	63L-39	TM,RM,UP			2000				6.1	9.9	4.0		
81	63L-19	TM,RM,LW	PW,C,T		—				6.2	7.3	4.0		
82	PC-528	TM,RM,LW	V		2122				4.0	4.5	1.0		
83	XR-7	TM,RM,LW	V		1120				8.4	12.9	1.7		
84	DDH3-251	TM,RM,LW	V		1000				4.9	7.4	3.8		
85	B374	TM,RM,LW	DW,C,T		1000				10.9	8.9	3.6		
44	SC-3 C	P,TC	DW,C,T		1953				—	14.2	0.9		
86	AGE-4	P,TC	DW,C,T		1011				—	10.8	1.5		
48	WH 1A	P,TC	DW,C,T		9620				—	2.1	tr		
44	SC-3A	P,TC	DW,C,T		6000				—	1.6	tr		
87	CF55V	CF,BF	V		3600				2.8	3.9	11.2		
87	CF115	CF,BF	W,C,T		3400				2.2	6.6	7.3		
88	0-7-84-3	CF,BF	W,C,T		3500				1.1	2.6	5.0		
89	0-1-70-13	CF,PP	W,C,T		4100				1.2	3.5	6.0		
90	CF 520	CF,PP	W,C,T		1410				2.9	5.2	5.0		

Appendix 3--Table 1

Loc	Sample number	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenocrysts				
		Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	Analyzer, date
67	WJC-176-62	1.7	--	0.2							0.1									0.7	
68	WJC-104-62	0.8	--	0.3							—									0.5	
69	WJC-48-62	0.6	--	tr							—									0.8	
70	WJC-181-62	0.7	--	0.1							0.1									0.1	
71	WJC-100-62	0.7	—	--							tr									0.3	
72	WJC-60-62	1.0	--	tr							tr									0.5	
73	SL 62 62	0.5	--	0.1							—									0.5	
74	WJC-116-62	0.4	--	0.3							tr									0.2	
75	WJC-56-62	0.6	--	tr?							tr									0.4	
76	WJC-54-62	0.3	--	tr?							0.1									0.5	
77	WJC-112-62	0.4	--	0.2							tr									0.3	
77	WJC-114-62	0.3	tr	tr							tr									0.3	
72	WJC-63-62	1.5	--	0.3							tr									0.9	
78	WJC-37-63	1.7	tr	1.3							0.3									0.6	
76	WJC-78-62	2.1	tr	0.4							0.3									0.9	
76	WJC-79-62	1.6	tr	0.7							0.1									0.3	
79	WJC-146-62	1.0	tr	1.0							tr									0.6	
80	63L-39	0.3	—	—							—									0.4	
81	63L-19	0.4	—	—							—									0.5	
82	PC-528	0.2	—	—							—									0.2	
83	XR-7	0.3	—	—							—									0.4	
84	DDH3-251	0.2	—	—							—									0.1	
85	B374	0.4	—	—							—									0.2	
44	SC-3 C	0.2	--	0.2							tr									0.3	
86	AGE-4	0.5	tr	0.2							tr									0.4	
48	WH 1A	tr	tr	--							tr									0.1	
44	SC-3A	tr	—	--							tr									0.1	
87	CF55V	1.4	0.3	—							tr									0.3	
87	CF115	0.6	0.1	—							tr									0.3	
88	0-7-84-3	0.9	—	--							—									0.1	
89	0-1-70-13	0.2	—	—							—									0.2	
90	CF 520	0.1	--	0.4							—									0.3	

Appendix 3—Table 2
Modified from Byers and Warren, 1983

Sample number	Fm, Mbr	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Felsic Phenocrysts Phen (%)	Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
J13-1883	CF,PP				1.6		12.5	10.5	54.3	32.1		
J13-2132	CF,BF				0.5		18.6	18.5	39.6	36.5		
J13-2183	CF,BF				0.0		18.9	22.7	36.4	32.6		
J13-2382.5	CF,TR				0.7		8.6	17.0	40.7	36.3		
J13-2532.1	CF,TR				0.9		10.7	25.5	34.8	29.8		
J13-2684	CF,TR				3.4		12.3	32.0	32.0	29.3		
J13-2685.2	CF,TR				1.4		13.9	30.8	26.4	34.1		
J13-2843	CF,TR				0.8		14.9	34.8	31.7	25.4		
J13-2998	CF,TR				13.5		7.9	27.1	30.5	39.8		
J13-3005	CF,TR				8.4		8.5	32.1	27.0	34.0		
J13-3030-C	CF,TR				7.0		13.0	39.0	26.0	30.0		
J13-3110-C	CF,TR				2.0		9.0	20.0	52.0	26.0		
J13-3150-C	CF,TR				2.0		7.0	18.0	35.0	44.0		
J13-3190-C	CF,TR				4.0		5.0	27.0	38.0	27.0		
J13-3200-C	CF,TR				2.0		4.0	18.0	36.0	36.0		
J13-3246	LR				8.7		9.2	2.5	21.7	71.2		
J13-3251	LR				8.4		12.5	1.1	14.4	76.5		
J13-3290-C	LR				5.0		15.0	1.0	18.0	74.0		
J13-3450-C	LR				23.0		11.0	6.0	39.0	49.0		
J13-3490	LR				20.0		>7	7.0	<41	>47		
J13-3491	LR				13.4		9.9	4.9	29.2	60.4		
J13-3497	LR				10.8		6.9	5.6	34.7	54.9		

Appendix 3—Table 2

Sample number	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenocrysts				
	Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	Analyzer, date
J13-1883	0.0	2.5								0	0		2						0.6	
J13-2132	2.7	1.9								0	0								0.8	
J13-2183	4.9	1.9								0	0								1.5	
J13-2382.5	5.0	0.0								1	0		12						0.9	
J13-2532.1	8.7	0.6								0	0		4						0.6	
J13-2684	5.4	0.7								0	0		3						0.7	
J13-2685.2	7.2	0.5								1	0		6						1.0	
J13-2843	5.8	1.8								1	0		5						0.4	
J13-2998	1.0	0.8								0	0		3						0.8	
J13-3005	5.4	0.0								0	0		6						1.6	
J13-3030-C	3.0	0.0																	2.0	
J13-3110-C	1.0	0.0																	0.0	
J13-3150-C	3.0	0.0																	0.0	
J13-3190-C	8.0	0.0																	0.0	
J13-3200-C	5.0	0.0								22	3		41						4.0	
J13-3246	0.6	1.2								17	2		20						2.8	
J13-3251	3.2	<1																	4.0	
J13-3290-C	<1	<1																	<5	
J13-3450-C	2.0	0.0																	2.0	
J13-3490	3.0	<1																	2.0	
J13-3491	4.9	0.0																	0.6	
J13-3497	2.6	0.0																	2.2	

Appendix 3—Table 3
Modified from Byers and Moore, 1987

Sample number	Fm, Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Felsic Phenocrysts: Phen (%)	Felsic Phenocrysts: Qtz (%)	Felsic Phenocrysts: AK-F (%)	Felsic Phenocrysts: Plag (%)	Felsic Phenocrysts: Plag comp	Fels size (mm)
UE25a1-276.6	P,TP,UV			6394	0.8		12.0	0.0	64.9	19.3		
UE25a1-334.7	P,TP,C			6404	0.0		16.2	0.0	71.8	22.6		
UE25a1-450.1	P,TP,UL			6359	0.0		2.4	1.0	53.0	40.0		
UE25a1-469.2	P,TP,UL			6222	0.5		2.8	0.0	55.0	37.0		
UE25a1-510.4	P,TP,UL			5280	0.3		0.7	0.0	15.0	70.0		
UE25a1-609.6	P,TP,UL			5511	0.0		0.8	0.0	11.0	80.0		
UE25a1-651.6	P,TP,MN			5282	0.5		1.1	0.0	22.0	68.0		
UE25a1-672.5	P,TP,MN			6006	0.2		0.6	0.0	19.0	64.0		
UE25a1-677.2	P,TP,MN			6136	0.1		0.7	2.0	39.0	54.0		
UE25a1-701.0	P,TP,MN			6240	0.2		0.6	1.0	31.0	54.0		
UE25a1-732.6	P,TP,MN			6465	0.3		0.7	3.0	31.5	62.0		
UE25a1-744.1	P,TP,LL			6215	0.5		1.0	5.0	24.0	64.0		
UE25a1-836.0	P,TP,LL			6773	3.9		0.6	3.5	20.0	66.0		
UE25a1-848.1	P,TP,LL			5841	1.5		1.1	0.0	22.0	70.0		
UE25a1-878.9	P,TP,LL			5955	1.0		0.6	1.0	33.0	50.0		
UE25a1-894.0	P,TP,LL			5915	0.2		0.6	3.0	30.0	58.0		
UE25a1-937.3	P,TP,LL			6196	0.7		1.5	3.0	18.0	71.0		
UE25a1-1011.8	P,TP,LL			5957	0.2		1.1	4.0	32.5	58.0		
UE25a1-1060.7	P,TP,LL			6040	0.4		0.7	2.0	13.0	79.0		
UE25a1-1112.5	P,TP,LN			6121	0.7		0.7	7.0	36.0	53.0		
UE25a1-1152.6	P,TP,LN			5570	5.8		1.4	17.0	17.0	64.0		
UE25a1-1195.2	P,TP,LN			6204	1.6		1.0	11.0	28.0	56.0		
UE25a1-1264.4	P,TP,AV			5792	16.7		0.9	26.0	26.0	42.0		
UE25a1-1279.2	P,TP,LV			5825	1.1		1.3	14.0	25.0	52.0		
USWG1-292	P,TP,C			5664	0.3		11.9	0.0	61.2	29.7		
USWG1-385.7	P,TP,VP			6228	0.0		15.2	0.0	69.7	25.2		
USWG1-450	P,TP,UL			5688	0.0		8.9	0.0	76.5	18.9		
USWG1-504	P,TP,UL			6142	0.0		1.7	0.0	72.0	26.5		
USWG1-619	P,TP,UL			5986	0.1		0.5	0.0	47.0	38.0		
USWG1-722	P,TP,UL			5691	0.6		0.6	0.0	31.0	53.0		
USWG1-757	P,TP,UL			6490	0.2		0.3	6.0	49.0	25.0		
USWG1-772.3	P,TP,MN			6213	0.2		0.7	12.0	33.0	48.0		
USWG1-795.6	P,TP,MN			6146	0.6		0.7	3.0	59.0	22.0		
USWG1-809.9	P,TP,MN			6286	1.0		1.4	7.0	45.0	44.0		
USWG1-835.3	P,TP,LL			6103	0.9		1.1	4.0	36.0	51.0		
USWG1-874.7	P,TP,LL			6068	0.2		1.3	1.5	35.0	59.0		
USWG1-931.2	P,TP,LL			5942	0.4		1.1	9.0	34.0	47.5		
USWG1-995.5	P,TP,LL			6257	0.9		1.0	6.0	23.0	65.0		
USWG1-1049.1	P,TP,LL			6221	6.3		1.0	3.0	41.0	44.0		
USWG1-1113.2	P,TP,LL			6166	0.8		0.9	13.0	34.5	46.5		
USWG1-1150.3	P,TP,LL			6199	1.3		0.8	7.0	33.0	47.0		
USWG1-1191	P,TP,LL			5852	0.1		1.3	4.0	7.0	82.0		
USWG1-1240	P,TP,LN			5649	0.3		1.2	6.5	13.0	75.0		
USWG1-1286	P,TP,AV			5395	9.3		1.0	18.0	25.0	55.0		
USWG1-1292	P,TP,V			5915	3.0		1.3	11.0	25.0	62.0		

Appendix 3--Table 3 (continued)

Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyzer, date
UE25a1-276.6	10.0																		1.8	FMB
UE25a1-334.7	3.7																		1.6	FMB
UE25a1-450.1	4.5																		1.0	FMB
UE25a1-469.2	5.0																		8.0	FMB
UE25a1-510.4	5.0																		10.0	FMB
UE25a1-609.6	4.0																		5.0	FMB
UE25a1-651.6	7.0																		3.0	FMB
UE25a1-672.5	4.0																		10.0	FMB
UE25a1-677.2	2.0																		3.0	FMB
UE25a1-701.0	2.5																		11.5	FMB
UE25a1-732.6	1.0																		2.5	FMB
UE25a1-744.1	5.0																		2.0	FMB
UE25a1-836.0	2.5																		8.0	FMB
UE25a1-848.1	6.0																		2.0	FMB
UE25a1-878.9	5.0																		5.0	FMB
UE25a1-894.0	4.0																		4.0	FMB
UE25a1-937.3	4.0																		4.0	FMB
UE25a1-1011.8	3.0																		1.0	FMB
UE25a1-1060.7	1.0																		5.0	FMB
UE25a1-1112.5	3.0																		1.0	FMB
UE25a1-1152.6	0.0																		1.0	FMB
UE25a1-1195.2	2.0																		3.0	FMB
UE25a1-1264.4	4.0																		2.0	FMB
UE25a1-1279.2	2.0																		5.0	FMB
USWG1-292	5.9																		2.7	FMB
USWG1-385.7	2.6																		1.1	FMB
USWG1-450	2.6																		0.6	FMB
USWG1-504	0.5																		1.0	FMB
USWG1-619	2.0																		13.0	FMB
USWG1-722	12.0																		4.0	FMB
USWG1-757	5.0																		14.0	FMB
USWG1-772.3	6.0																		1.0	FMB
USWG1-795.6	5.0																		8.0	FMB
USWG1-809.9	2.0																		2.0	FMB
USWG1-835.3	3.0																		6.0	FMB
USWG1-874.7	3.0																		1.5	FMB
USWG1-931.2	6.0																		3.5	FMB
USWG1-995.5	0.0																		6.0	FMB
USWG1-1049.1	8.0																		2.0	FMB
USWG1-1113.2	2.0																		4.0	FMB
USWG1-1150.3	10.0																		3.0	FMB
USWG1-1191	2.0																		2.0	FMB
USWG1-1240	1.5																		3.5	FMB
USWG1-1286	2.0																		0.0	FMB
USWG1-1292	1.0																		1.0	FMB

Appendix 3--Table 3 (continued)
Modified from Byers and Moore, 1987

Sample number	Fm, Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Felsic Phenocrysts: Phen (%)	Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
USWG2-770	P,TP,UV			5072	1.3		19.0	0.0	56.3	32.0		
USWG2-882	P,TP,C			5936	0.1		12.5	0.1	65.0	27.4		
USWG2-855	P,TP,C			5400	0.3		17.5	0.0	66.8	25.2		
USWG2-898	P,TP,C			4545	0.1		15.8	0.0	68.1	26.9		
USWG2-921	P,TP,LX			5258	0.0		2.4	44.0	28.0	25.5		
USWG2-921B	P,TP,LX			6238	0.0		2.4	33.0	50.0	15.3		
USWG2-921C	P,TP,LX			6171	0.0		2.5	30.5	61.5	4.2		
USWG2-951	P,TP,UL			5700	1.4		1.1	2.0	52.0	40.0		
USWG2-1032	P,TP,UL			5895	0.0		1.2	3.0	24.5	65.5		
USWG2-1072	P,TP,UL			6139	0.3		1.0	1.0	12.0	78.0		
USWG2-1178	P,TP,UL			4671	0.4		0.5	0.0	39.0	53.0		
USWG2-1178B	P,TP,UL			4888	0.4		0.5	0.0	37.0	61.0		
USWG2-1234	P,TP,UL			4839	0.0		0.8	7.0	20.0	61.0		
USWG2-1267.6	P,TP,LPZ			5903	0.7		0.7	9.0	43.0	42.0		
USWG2-1331	P,TP,LL			4576	6.8		1.3	9.0	14.0	72.0		
USWG2-1420	P,TP,LL			5276	2.8		1.1	12.0	20.5	58.5		
USWG2-1461	P,TP,LL			5462	1.1		1.1	7.0	41.0	48.0		
USWG2-1556	P,TP,LL			5546	1.3		0.8	7.0	22.0	59.0		
USWG2-1585	P,TP,LL			5340	1.4		1.0	16.0	28.0	51.0		
USWG2-1634	P,TP,AV			8070	0.7		0.4	6.0	6.0	69.0		
USWG2-1664	P,TP,LV			10720	2.6		1.1	14.0	21.5	59.5		
USWGU3-430.5	P,TP,UV			5024	0.1		15.2	0.0	60.1	31.4		
USWGU3-430.7	P,TP,UV			5993	0.2		15.6	0.0	44.1	44.0		
USWGU3-464.5	P,TP,C			5322	0.0		12.9	0.0	70.0	22.8		
USWGU3-465.5	P,TP,C			5277	0.1		13.5	0.0	74.1	20.7		
USWGU3-525.4	P,TP,C			5250	0.0		6.7	0.0	65.8	25.6		
USWGU3-525.7	P,TP,C			5424	0.0		3.9	0.0	57.3	35.2		
USWGU3-633.3	P,TP,UL			6036	0.1		1.0	0.0	27.0	68.0		
USWGU3-633.4	P,TP,UL			4423	0.0		0.8	0.0	57.0	35.0		
USWGU3-698.5	P,TP,UL			5672	0.6		1.5	0.0	15.0	77.0		
USWGU3-735.5	P,TP,MN			6412	0.3		0.9	2.0	55.0	36.0		
USWGU3-769.1	P,TP,MN			5903	0.6		0.6	3.0	49.0	36.0		
USWGU3-769.2	P,TP,MN			4867	0.4		0.8	0.0	26.0	66.0		
USWGU3-805.0	P,TP,MN			6130	0.0		0.7	0.0	14.5	69.0		
USWGU3-829.9	P,TP,MN			6088	1.3		1.1	3.0	23.0	68.0		
USWGU3-877.6	P,TP,LL?			6195	4.0		1.1	8.0	15.5	71.5		
USWGU3-911.3	P,TP,LL			6329	4.2		1.0	10.0	44.0	41.5		
USWGU3-954.8	P,TP,LL			5488	0.5		0.9	18.0	43.0	35.0		
USWGU3-954.9	P,TP,LL			5780	1.0		1.0	11.0	8.0	77.0		
USWGU3-1019.7	P,TP,LL			5918	2.7		1.0	9.0	34.0	52.0		
USWGU3-1079.4	P,TP,LN			5623	1.5		0.9	5.5	38.5	44.0		
USWGU3-1130.3	P,TP,LN			6041	4.8		1.0	12.0	22.0	58.0		
USWGU3-1130.4	P,TP,LN			5243	1.3		1.4	10.0	25.0	52.0		
USWGU3-1151.7	P,TP,LN			5910	4.8		0.8	3.0	19.0	60.0		
USWGU3-1174.9	P,TP,LN			5076	7.9		1.5	0.0	57.0	38.0		

Appendix 3--Table 3 (continued)

	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenocrysts				
Sample number	Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	Analyzer, date
USWG2-770	6.5																		2.5	FMB
USWG2-882	4.3																		1.8	FMB
USWG2-855	5.1																		2.5	FMB
USWG2-898	3.5																		0.6	FMB
USWG2-921	0.5																		2.0	FMB
USWG2-921B	1.0																		0.7	FMB
USWG2-921C	3.0																		0.8	FMB
USWG2-951	4.0																		2.0	FMB
USWG2-1032	4.0																		3.0	FMB
USWG2-1072	2.0																		7.0	FMB
USWG2-1178	4.0																		4.0	FMB
USWG2-1178B	2.0																		0.0	FMB
USWG2-1234	5.0																		7.0	FMB
USWG2-1267.6	1.5																		4.5	FMB
USWG2-1331	4.0																		1.0	FMB
USWG2-1420	6.0																		3.0	FMB
USWG2-1461	4.0																		0.0	FMB
USWG2-1556	10.0																		2.0	FMB
USWG2-1585	4.0																		1.0	FMB
USWG2-1634	11.0																		8.0	FMB
USWG2-1664	2.5																		2.5	FMB
USWGU3-430.5	4.8																		1.7	FMB
USWGU3-430.7	5.7																		3.0	FMB
USWGU3-464.5	2.5																		1.8	FMB
USWGU3-465.5	3.2																		0.8	FMB
USWGU3-525.4	3.7																		1.7	FMB
USWGU3-525.7	2.3																		3.8	FMB
USWGU3-633.3	2.0																		4.0	FMB
USWGU3-633.4	7.0																		1.0	FMB
USWGU3-698.5	5.0																		2.0	FMB
USWGU3-735.5	3.0																		1.0	FMB
USWGU3-769.1	5.0																		7.0	FMB
USWGU3-769.2	0.0																		8.0	FMB
USWGU3-805.0	9.5																		6.0	FMB
USWGU3-829.9	1.5																		3.0	FMB
USWGU3-877.6	2.0																		2.0	FMB
USWGU3-911.3	3.5																		1.0	FMB
USWGU3-954.8	1.0																		4.0	FMB
USWGU3-954.9	0.0																		2.0	FMB
USWGU3-1019.7	4.0																		1.0	FMB
USWGU3-1079.4	3.0																		7.0	FMB
USWGU3-1130.3	3.0																		5.0	FMB
USWGU3-1130.4	3.0																		7.0	FMB
USWGU3-1151.7	4.0																		14.0	FMB
USWGU3-1174.9	1.0																		4.0	FMB

Appendix 3--Table 3 (continued)
Modified from Byers and Moore, 1987

Sample number	Fm, Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts: Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
USWGU3-1195.8	P,TP,AV			5065	5.9		1.7	24.0	22.0	51.0		
USWGU3-1226.8	P,TP,LV			5677	3.5		1.0	9.0	56.0	27.0		

Appendix 3--Table 3 (continued)

Sample number	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenocrysts				Analyzer, date
	Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	
USWGU3-1195.8	1.0																		2.0	FMB
USWGU3-1226.8	3.0																		4.0	FMB

Appendix 3--Table 4
Modified from Warren and others, 1984

Loc	Sample number	Fm, Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts				
									Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
	USWG1-1561.8	CH,1	NWT		3750	2.8			43.0	16.0	41.0		
	USWG1-1689.5	CH,1	NWT		8000	1.8			51.0	24.0	25.0		
	USWG1-1811.7	CF,PP	PWT		3600	0.1			15.0	53.0	32.0		
	USWG1-1943.4	CF,PP	MWT		3300	0.5			13.0	39.0	48.0		
	USWG1-2009.8	CF,PP	PWT		3750	2.6			15.0	47.0	38.0		
	USWG1-2124.7	CF,PP	NWT		3600	0.6			6.0	50.0	44.0		
	USWG1-2231.0	CF,BF,U	PWT		3700	.0			22.0	36.0	42.0		
	USWG1-2246.0	CF,BF,U	P-MWT		3000	0.0			19.0	45.0	36.0		
	USWG1-2300.4	CF,BF,U	PWT		3750	0.0			24.0	31.0	45.0		
	USWG1-2354.6	CF,BF,M	MWT		3750	.0			27.0	30.0	43.0		
	USWG1-2397	CF,BF,M	PWT		3750	0.2			23.0	32.0	45.0		
	USWG1-2461.5	CF,BF,L	MWT		3650	0.9			5.0	44.0	51.0		
	USWG1-2470.6	CF,BF,L	PWT		3700	1.6			18.0	29.0	53.0		
	USWG1-2478.3	CF,BF,L	PWT		3750	0.5			14.0	39.0	47.0		
	USWG1-2507	CF,BF,L	MWT		3700	1.2			13.0	36.0	51.0		
	USWG1-2555	CF,BF,L	MWT		3520	0.8			9.0	40.0	51.0		
	USWG1-2594.2	CF,BF,L	PWT		3750	2.2			17.0	32.0	51.0		
	USWG1-2678.0	CF,TR,U	PWT		3980	1.3			15.0	34.0	51.0		
	USWG1-2772.6	CF,TR,U	PWT		3800	2.1			29.0	34.0	37.0		
	USWG1-2851.7	CF,TR,U	MWT		3900	4.5			41.0	37.0	22.0		
	USWG1-2869	CF,TR,U	M-DWT		3360	3.8			41.0	35.0	24.0		
	USWG1-2931.4	CF,TR,U	M-DWT		4000	3.3			37.0	32.0	31.0		
	USWG1-3013.9	CF,TR,U	PWT		3500	12.3			27.0	44.0	29.0		
	USWG1-3192.8	CF,TR,L	PWT		3600	23.8			33.0	30.0	37.0		
	USWG1-3197	CF,TR,L	MWT		3640	22.3			38.0	29.0	33.0		
	USWG1-3284.5	CF,TR,L	PWT		3600	9.0			35.0	31.0	34.0		
	USWG1-3515.1	CF,TR,L	PWT		3800	25.8			34.0	22.0	44.0		
	USWG1-3724.0	FB	FB		3700	0.0			0.0	0.0	100.0		
	USWG1-3908.2	FB	FB		3150	0.0			0.0	0.0	100.0		
	USWG1-3969.9	LR	MWT		3300	9.0			2.0	34.0	64.0		
	USWG1-3992	LR	PWT		3500	26.5			4.0	31.0	65.0		
	USWG1-4150.4	LR	PWT		3400	13.8			2.0	35.0	63.0		
	USWG1-4222.1	LR	PWT		3200	42.7			7.0	40.0	53.0		
	USWG1-4408.4	LR	PWT		1800	11.8			1.0	37.0	62.0		
	USWG1-4471.0	LR	PWT		3600	26.4			7.0	36.0	57.0		
	USWG1-4578.2	LR	PWT		3800	23.8			5.0	39.0	56.0		
	USWG1-4758.4	LR	PWT		3900	19.0			9.0	38.0	53.0		
	USWG1-4849.0	LR	PWT		3900	13.0			10.0	35.0	55.0		
	USWG1-4917.0	LR	NWT		3800	5.9			14.0	51.0	35.0		
	USWG1-4946.4	OG1-A	NWT		3450	4.4			20.0	58.0	22.0		
	USWG1-4969.0	OG1-A	PWT		3700	3.1			24.0	31.0	45.0		
	USWG1-5002.3	OG1-A	NWT		3700	2.5			32.0	31.0	37.0		
	USWG1-5045.0	OG1-A	MWT		3700	8.9			28.0	43.0	29.0		
	USWG1-5097.9	OG1-A	MWT		3600	0.6			28.0	41.0	31.0		
	USWG1-5115.5	OG1-A	MWT		3750	3.1			24.0	42.0	34.0		

Appendix 3--Table 4 (continued)

Loc	Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyzer, date
	USWG1-1561.8	tr	0.0	0.0		0.0					0	0	0	0							
	USWG1-1689.5	tr	0.0	0.0		0.0					0	0	0	4							
	USWG1-1811.7	tr	0.0	0.0		0.2					0	0	0	4							
	USWG1-1943.4	tr	0.0	0.0		tr					0	0	0	8							
	USWG1-2009.8	tr	tr	0.0		0.2					0	1		5							
	USWG1-2124.7	tr	0.0	0.0		0.0					0	2		7							
	USWG1-2231.0	0.3	0.1	0.0		0.0					0	0		9							
	USWG1-2246.0	0.4	0.1	0.0		0.0					0	0		7							
	USWG1-2300.4	0.2	0.2	0.0		0.0					0	0		13							
	USWG1-2354.6	0.4	0.2	0.0		0.0					0	0		10							
	USWG1-2397	0.5	0.1	0.0		0.0					0	0		7							
	USWG1-2461.5	0.2	0.2	0.0		0.0					0	0		8							
	USWG1-2470.6	0.5	0.1	0.0		0.0					0	0		10							
	USWG1-2478.3	0.4	tr	0.0		0.0					0	0		5							
	USWG1-2507	0.4	0.3	0.0		0.0					0	0		12							
	USWG1-2555	0.2	0.2	0.0		0.0					0	0		5							
	USWG1-2594.2	0.4	tr	0.0		0.0					0	4		10							
	USWG1-2678.0	0.7	0.0	0.0		0.0					2	1		6							
	USWG1-2772.6	0.6		0.0		0.0					0	0		5							
	USWG1-2851.7	0.4	0.0	0.0		0.0					0	0		11							
	USWG1-2869	0.6	0.0	0.0		0.0					0	0		7							
	USWG1-2931.4	0.7	0.0	0.0		0.0					0	0		9							
	USWG1-3013.9	0.5	0.0	0.0		0.0					0	10		2							
	USWG1-3192.8	0.4	0.0	0.0		0.0					0	0		3							
	USWG1-3197	0.3	0.0	0.0		0.0					0	0		3							
	USWG1-3284.5	0.3	0.0	0.0		0.0					0	4		8							
	USWG1-3515.1	0.3	tr	0.0		0.0					0	1									
	USWG1-3724.0	0.0	1.1	0.0		0.0					0	0		0							
	USWG1-3908.2	0.0	0.8	0.3		0.8					0	0		0							
	USWG1-3969.9	0.6	0.0	0.0		0.0					11	3									
	USWG1-3992	1.0	0.0	0.0		0.0					12	1									
	USWG1-4150.4	0.1	0.0	0.0		0.0					6	1		8							
	USWG1-4222.1	0.2	0.0	0.0		0.0					6	0		5							
	USWG1-4408.4	0.5	0.0	0.0		0.0					1	1		7							
	USWG1-4471.0	0.4	0.0	0.0		0.0					8	1		12							
	USWG1-4578.2	0.3	0.0	0.0		0.0					2	2		9							
	USWG1-4758.4	0.3	0.0	0.0		0.0					6	0		10							
	USWG1-4849.0	0.3	0.0	0.0		0.0					7	0		10							
	USWG1-4917.0	0.3	0.0	0.0		0.0					11	3		12							
	USWG1-4946.4	0.3	0.0	0.0		0.0					4	2		12							
	USWG1-4969.0	0.5	0.0	0.0		0.0					5	0		10							
	USWG1-5002.3	0.5	0.0	0.0		0.0					3	3		13							
	USWG1-5045.0	0.4	0.0	0.0		0.0					2	0		19							
	USWG1-5097.9	0.2	0.0	0.0		0.0					1	3		10							
	USWG1-5115.5	0.5	0.0	0.0		0.0					2	11		20							

Appendix 3--Table 4 (continued)
Modified from Warren and others, 1984

Loc	Sample number	Fm, Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
	USW G1-5141.5	OG1-A	MWT		3700	9.2			27.0	33.0	40.0		
	USW G1-5142.2	OG1-A	PWT		3750	2.2			28.0	36.0	36.0		
	USW G1-5187.0	OG1-A	NWT		3650	2.1			24.0	38.0	38.0		
	USW G1-5265.6	OG1-A	PWT		3400	5.4			35.0	31.0	34.0		
	USW G1-5316.0	OG1-A	B		3600	2.4			33.0	36.0	31.0		
	USW G1-5373.7	OG1-B	PWT		3650	0.7			13.0	26.0	61.0		
	USW G1-5400.0	OG1-B	PWT		3800	2.3			12.0	30.0	58.0		
	USW G1-5416.6	OG1-B	PWT		3700	12.8			11.0	27.0	62.0		
	USW G1-5438.2	OG1-C	PWT		3900	0.7			1.0	3.0	96.0		
	USW G1-5454.1	OG1-C	B		3800	1.9			16.0	18.0	66.0		
	USW G1-5496.1	OG1-C	PWT		3900	7.5			1.0	4.0	95.0		
	USW G1-5517.3	OG1-C	PWT		3600	10.3			2.0	9.0	89.0		
	USW G1-5540.0	OG1-C	PWT		3700	8.5			0.4	0.0	99.6		
	USW G1-5558.7	OG1-C	PWT		3600	0.6			4.0	4.0	92.0		
	USW G1-5600.0	OG1-C	MWT		3750	8.4			5.0	7.0	88.0		
	USW G1-5642.0	OG1-C	MWT		3300	5.8			2.0	4.0	94.0		
	USW G1-5728.0	OG1-C	MWT		1650	21.1			0.0	1.0	99.0		
	USW G1-5841.0	OG1-C	MWT		1650	10.8			0.0	4.0	96.0		
	USW G1-5894.3	OG1-C	MWT		1650	7.2			0.0	4.0	96.0		
	USW G1-5929.8	OG1-C	MWT		1650	5.9			4.0	4.0	92.0		
	USW G1-5944.9	OG1-C	M-DWT		1600	6.3			1.0	6.0	93.0		
	USW G1-5980.0	OG1-C	M-DWT		1650	3.3			0.0	0.3	99.7		
	USW G1-5984.7	OG1-C	M-DWT		1650	2.3			0.0	0.0	100.0		
	USW G1-1392	P,TP,L	PWT		500	1.2			3*	7*	90*		
	USW G1-1436	CH,1	NWT		500	3.2			56*	22*	22*		
	USW G1-1561	CH,1	NWT		500	2.8			52*	22*	26*		
	USW G1-1639	CH,1	NWT		500	1.4			58*	17*	25*		
	USW G1-1774	CH,2	B		500	3.0			32*	14*	54*		
	USW G1-1820	CF,PP	PWT		500	1.4			12*	43*	45*		
	USW G1-1854	CF,PP	PWT		486	1.0			15*	39*	46*		
	USW G1-1884	CF,PP	PWT		500	1.0			13*	46*	41*		
	USW G1-1983	CF,PP	P-MWT		500	0.4			8*	49*	43*		
	USW G1-2083	CF,PP	PWT		500	0.6			10*	42*	48*		
	J13-1882	CF,PP	PWT		300	1.0			17*	40*	43*		
91	RWG2a-3	CF,PP	DWT		516	0.8			14.0	45.0	41.0		
92	RW31A-6	CF,PP	NWT		597	0.2			28.0	31.0	41.0		
	USW G1-2166	BT	B		527	2.6			0.0	52.0	48.0		
	USW G1-2233	CF,BF,U	NWT		500	0.4			32*	26*	42*		
	USW G1-2247	CF,BF,U	NWT		500	0.4			32*	29*	39*		
	USW G1-2289	CF,BF,U	NWT		500	1.0			13*	29*	58*		
	USW G1-2291	CF,BF,U	NWT		500	0.6			33*	32*	35*		
	USW G1-2318	CF,BF,M	NWT		500	0.0			31*	33*	36*		
	USW G1-2363	CF,BF,M	PWT		500	0.2			22*	40*	38*		
	USW G1-2411	CF,BF,M	PWT		431	3.0			22*	34*	44*		
	USW G1-2436	CF,BF,L	MWT		500	0.6			12*	39*	49*		

Appendix 3--Table 4 (continued)

Loc	Sample number	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenocrysts				
		Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	Analyzer, date
	USWG1-5141.5	0.2	0.0	0.0		0.0					4	4		15							
	USWG1-5142.2	0.4	tr	0.0		0.0					7	5		13							
	USWG1-5187.0	0.2	tr	0.0		0.0					6	7		26							
	USWG1-5265.6	0.2	tr	0.0		0.0					6	8		17							
	USWG1-5316.0	0.1	0.0	0.0		0.0					4	12		13							
	USWG1-5373.7	0.9	0.0	0.0		0.0					15	1		20							
	USWG1-5400.0	0.5	0.0	0.0		0.0					8	1		24							
	USWG1-5416.6	0.3	0.0	0.0		0.0					5	1		20							
	USWG1-5438.2	1.2	0.0	0.0		0.0					0	1		50							
	USWG1-5454.1	0.7	0.0	0.0		0.0					9	9		42							
	USWG1-5496.1	2.1	0.0	0.0		0.0					8	3		21							
	USWG1-5517.3	1.1	0.0	0.0		0.0					9	2		20							
	USWG1-5540.0	1.9	tr	0.0		0.0					1	0		29							
	USWG1-5558.7	1.6	0.1	0.0		0.0					12	3		20							
	USWG1-5600.0	1.0	tr	0.0		0.0					16	4		24							
	USWG1-5642.0	2.2	0.2	0.0		0.0					12	3		22							
	USWG1-5728.0	1.8	0.0	0.0		0.0					4	3		24							
	USWG1-5841.0	1.2	tr	0.0		0.0					3	1		26							
	USWG1-5894.3	0.6	0.6	0.0		0.0					6	1		14							
	USWG1-5929.8	1.3	0.6	0.0		0.0					7	8		24							
	USWG1-5944.9	0.7	0.8	0.0		0.0					8	5		24							
	USWG1-5980.0	2.4	0.7	0.2		0.0					4	1		24							
	USWG1-5984.7	2.7	0.9	0.1		0.0					1	3		25							
	USWG1-1392	tr	0.0	0.0		0.0					0.0	0.0		tr							
	USWG1-1436	tr	0.0	0.0		0.0					0.0	tr	tr	tr							
	USWG1-1561	tr	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-1639	tr	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-1774	0.3	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-1820	tr	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-1854	tr	tr	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-1884	tr	0.0	0.0		0.0					0.0	0.0	0	tr							
	USWG1-1983		0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2083		0.0	0.0		0.0					0.0	tr	tr	tr							
	J13-1882	0.1	0.0	0.0		0.0					0.0	0.0	tr	tr							
91	RW62a-3	tr	tr	0.0		0.5					0.0	tr	tr	tr							
92	RW31A-6	tr	tr	0.0		0.0					0.0	tr	tr	tr							
	USWG1-2166	tr	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2233	0.3	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2247	0.3	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2289	0.3		0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2291	0.2		0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2318	0.4	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2363	0.3		0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2411	0.2		0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2436	0.3		0.0		0.0					0.0	0.0	tr	tr							

Appendix 3--Table 4 (continued)
Modified from Warren and others, 1984

Loc	Sample number	Fm, Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts: Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
	USWG1-2477	CF,BF,L	P-MWT		459	0.9			13*	33*	54*		
	USWG1-2486	CF,BF,L	P-MWT		500	5.2			6*	52*	42*		
	USWG1-2555	CF,BF,L	P-MWT		2516	2.3			7*	45.0	48.0		
	USWG1-2601	CF,BF,L	PWT		500	2.0			11*	39*	50*		
	J13-2175	CF,BF	MWT		300	0.0			26*	39*	45*		
93	RWG2a-4	CF,BF	NWT		509	0.2			18.0	42.0	40.0		
94	RWG2a-5	CF,BF	MWT		462	0.0			22.0	39.0	39.0		
95	CFLSM-1	CF,BF	MWT		516	2.5			24.0	38.0	38.0		
96	CFLSM-5	CF,BF	PWT		480	4.4			15.0	32.0	53.0		
97	TBF-4	CF,BF	NWT		558	1.1			20.0	31.0	49.0		
97	TBF-1	CF,BF	VT		464	1.5			12.0	32.0	56.0		
	USWG1-2641.5	CF,TR,U	PWT		500	1.6			12*	32*	56*		
	USWG1-2699	CF,TR,U	PWT		500	1.0			48*	31*	21*		
	USWG1-2790	CF,TR,U	PWT		599	9.3			68*	17*	15*		
	USWG1-2854	CF,TR,U	P-MWT		441	2.0			65*	26*	9*		
	USWG1-2869	CF,TR,U	MWT		2023	4.4			40.0	35.0	25.0		
	USWG1-2901	CF,TR,U	DWT		500	2.0			56*	25*	19*		
	USWG1-2938	CF,TR,U	M-DWT		425	1.9			43*	38*	19*		
	USWG1-3001	CF,TR,U	DWT		500	5.4			45*	30*	25*		
	USWG1-3117	CF,TR,L	PWT		500	21.0			68*	13*	19*		
	USWG1-3197	CF,TR,L	NWT		2154	27.0			29.0	29.0	42.0		
	USWG1-3258	CF,TR,L	NWT		2157	2.0			34.0	33.0	33.0		
	USWG1-3321	CF,TR,L	NWT		500	23.0			68*	19*	13*		
	USWG1-3372	CF,TR,L	NWT		500	37.0			43*	36*	21*		
	USWG1-3501	CF,TR,L	PWT		500	34.0			40*	19*	42*		
	J13-2382	CF,TR	NWT		300	1.3			25*	34*	41*		
	J13-2980	CF,TR	MWT		300	5.3			40*	26*	34*		
98	RWBWa-5	CF,TR	MWT		467	0.0			24.0	40.0	36.0		
	USWG1-3598	FB	FB		500	0.0			0*	0*	100*		
	USWG1-3659	FB	FB		500	0.0			0*	0*	100*		
	USWG1-3706	FB	FB		500	0.0			0*	0*	100*		
	USWG1-3850	FB	FB		500	0.0			0*	0*	100*		
	USWG1-3941	LR	B		599	6.8			0*	0*	100*		
	USWG1-3997	LR	NWT		577	13.0			6*	58*	36*		
	USWG1-4095	LR	NWT		597	26.0			2*	45*	53*		
	USWG1-4208	LR	NWT		610	39.0			0*	71*	29*		
	USWG1-4296	LR	NWT		675	19.0			8*	70*	22*		
	USWG1-4342	LR	NWT		557	10.0			7*	35*	58*		
	USWG1-4401	LR	NWT		560	17.0			1*	67*	32*		
	USWG1-4504	LR	NWT		629	20.0			5*	68*	28*		
	USWG1-4612	LR	NWT		650	30.0			3*	47*	49*		
	USWG1-4700	LR	PWT		579	19.0			10*	35*	55*		
	USWG1-4805	LR	PWT		601	19.0			1*	44*	55*		
	USWG1-4877	LR	PWT		656	11.0			6*	50*	44*		
	USWG1-4913	LR	PWT		553	9.6			12*	50*	38*		

Appendix 3--Table 4 (continued)

Loc	Sample number	Mafic Phenocrysts Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenocrysts Opq	Opaque type	Opq size (mm)	Opq (%)	Analyzer, date
	USWG1-2477	0.3		0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2486	0.2		0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2555	0.2	0.2	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2601	0.2		0.0		0.0					0.0	tr	tr	tr							
	J13-2175	0.4	0.0	0.0		0.0					0.0	0.0	tr	tr							
93	RWG2a-4	0.3		0.0		0.0					0.0	0.0	tr	tr							
94	RWG2a-5	0.5		0.0		0.0					tr	0.0	tr	tr							
95	CFLSM-1	0.2	0.0	0.0		0.0					0.0	0.0	tr	tr							
96	CFLSM-5	0.4	tr	0.0		0.0					0.0	0.0	tr	tr							
97	TBF-4	0.3	0.2	0.0		0.0					0.0	tr	tr	tr							
97	TBF-1	0.4	0.1	0.0		0.0					tr	tr	tr	tr							
	USWG1-2641.5	0.6	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2699	0.5	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2790	0.3	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2854	0.3	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2869	0.5	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2901	0.4	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-2938	0.6	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-3001	0.3	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-3117	0.1	0.0	0.0		0.0					0.0	tr	tr	tr							
	USWG1-3197	0.3	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-3258	0.2	0.0	0.0		0.0					0.0	tr	tr	tr							
	USWG1-3321	0.2	0.0	0.0		0.0					0.0	tr	tr	tr							
	USWG1-3372	0.2	0.0	0.0		0.0					0.0	tr	tr	tr							
	USWG1-3501	0.2	0.0	0.0		0.0					0.0	tr	tr	tr							
	J13-2382	0.5	0.0	0.0		0.0					tr	0.0	tr	tr							
	J13-2980	0.4	0.0	0.0		0.0					0.0	0.0	tr	tr							
98	RWBWa-5	0.4	0.0	0.0		0.0					0.0	tr	tr	tr							
	USWG1-3598	0.0	0.2	0.1							0.0	0.0	tr	tr							
	USWG1-3659	0.0	1.0	0.3		1.1					0.0	0.0	0.1	tr							
	USWG1-3706	0.0	0.2								0.0	0.0	0.2	0							
	USWG1-3850	tr	0.2	tr							0.0	0.0	tr	0							
	USWG1-3941	0.3	tr	0.0		0.0					tr	0.0	tr	tr							
	USWG1-3997	0.5	0.0	0.0		0.0					tr	tr	tr	tr							
	USWG1-4095	0.1	0.0	0.0		0.0					tr	tr	tr	tr							
	USWG1-4208	0.2	0.0	0.0		0.0					tr	tr	tr	tr							
	USWG1-4296	0.2	0.0	0.0		0.0					tr	tr	tr	tr							
	USWG1-4342	0.2	tr	0.0		0.0					tr	tr	tr	tr							
	USWG1-4401	0.2	0.0	0.0		0.0					tr	0.0	tr	tr							
	USWG1-4504	0.3	0.0	0.0		0.0					0.0	tr	tr	tr							
	USWG1-4612	0.2	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-4700	0.2	0.0	0.0		0.0					0.0	tr	tr	tr							
	USWG1-4805	0.3	0.0	0.0		0.0					0.0	tr	tr	tr							
	USWG1-4877	0.3	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USWG1-4913	0.1	0.0	0.0		0.0					0.0	tr	tr	tr							

Appendix 3--Table 4 (continued)
Modified from Warren and others, 1984

Loc	Sample number	Fm, Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts: Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
	J13-3493	LR	NWT		300	11.0			4*	45*	48*		
	USWG1-4998	OG1-A	B		457	4.2			37*	31*	32*		
	USWG1-5026	OG1-A	PWT		650	1.8			34*	40*	26*		
	USWG1-5094	OG1-A	PWT		546	2.0			49*	19*	32*		
	USWG1-5127	OG1-A	PWT		632	3.5			29*	33*	38*		
	USWG1-5167	OG1-A	NWT		688	15.0			22*	42*	36*		
	USWG1-5213	OG1-A	PWT		571	7.5			39*	36*	25*		
	USWG1-5296	OG1-A	PWT		584	2.7			23*	55*	22*		
	USWG1-5312	OG1-A	B		626	3.8			35*	46*	19*		
	USWG1-5349	OG1-B	B		421	20.0			13*	16*	71*		
	USWG1-5413	OG1-B	PWT		610	11.0			44*	8*	48*		
	USWG1-5498	OG1-C	PWT		622	6.8			0*	8*	92*		
	USWG1-5637	OG1-C	MWT		659	5.9			0*	5*	95*		
	USWG1-5680	OG1-C	B		660	5.9			0*	2*	98*		
	USWG1-5747	OG1-C	PWT		583	6.3			0*	0*	100*		
	USWG1-5848	OG1-C	PWT		627	20.0			0*	10*	90*		
	USWG1-5948	OG1-C	PWT		636	4.2			0*	12*	88*		

Appendix 3—Table 4 (continued)

Loc	Sample number	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenocrysts				Analyzer, date
		Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	
	J13-3493	0.2	0.0	0.0		0.0					0.0	0.0	tr	tr							
	USW G1-4998	0.4	0.0	0.0		0.0					0.0	tr	tr	tr							
	USW G1-5026	0.2	0.0	0.0		0.0					0.0	tr	tr	tr							
	USW G1-5094	0.2	0.0	0.0		0.0					0.0	tr	tr	tr							
	USW G1-5127	0.2	0.0	0.0		0.0					tr	tr	tr	tr							
	USW G1-5167	tr	tr	0.0		0.0					tr	tr		tr							
	USW G1-5213	0.2	tr	0.0		0.0					tr	tr	tr	tr							
	USW G1-5296	0.2	tr	0.0		0.0					tr	tr	tr	tr							
	USW G1-5312	tr	0.0	0.0		0.0					tr	tr	tr	tr							
	USW G1-5349	0.2	0.0	0.0		0.0					tr	tr	tr	tr							
	USW G1-5413	0.6	0.0	0.0		0.0					tr	tr	tr	tr							
	USW G1-5498	0.5	0.0	0.0		0.0					tr	tr	tr	tr							
	USW G1-5637	1.1		0.0		0.0					tr	tr	tr	tr							
	USW G1-5680	0.4	tr	0.0		0.0					tr	tr	tr	tr							
	USW G1-5747	1.0	0.0	0.0		0.0					tr	tr	tr	tr							
	USW G1-5848	0.6	0.0	0.0		0.0					tr	tr	tr	tr							
	USW G1-5948	0.5	tr	0.0		0.0					tr	0.0	tr	tr							

Appendix 3—Table 5
Modified from Byers, 1985

Sample number	Fm, Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
USW64-241.6	P,TP,UV			5229	0.9		12.1	0.2	53.6	31.4		
USW64-307.6	P,TP,VP			5663	0.1		15.7	0.0	48.1	42.5		
USW64-383	P,TP,VP			5037	0.1		12.6	0.0	74.6	21.5		
USW64-410	P,TP,UL			5165	0.1		6.8	0.6	67.1	28.0		
USW64-416	P,TP,UL			5217	0.0		8.5	<1	61.4	34.5		
USW64-447	P,TP,UL			3144	0.1		2.6	0.0	51.0	44.7		
USW64-500.9	P,TP,UL			6220	0.4		0.7	7.0	13.0	66.0		
USW64-514	P,TP,UL			5672	0.0		1.4	1.0	48.0	44.0		
USW64-556	P,TP,UL			5954	0.0		0.6	0.0	20.0	78.0		
USW64-625	P,TP,UL			5556	1.5		1.4	1.0	47.0	45.0		
USW64-625.7	P,TP,UL			5556	0.1		1.0	0.0	20.0	69.0		
USW64-677	P,TP,UL			5624	0.1		0.6	0.0	19.0	64.0		
USW64-694	P,TP,MN			5661	0.2		1.1	1.0	21.0	70.0		
USW64-746	P,TP,MN			5629	0.1		0.5	<1	31.0	61.0		
USW64-817	P,TP,LL			5769	0.0		1.6	3.0	20.0	71.0		
USW64-934	P,TP,LL			5936	0.6		0.9	5.0	24.0	67.0		
USW64-1026	P,TP,LL			5402	1.3		0.9	9.0	24.0	59.0		
USW64-1089	P,TP,LL			5897	0.6		0.4	6.0	20.0	61.0		
USW64-1117	P,TP,LL			5409	1.9		1.2	1.0	30.0	58.0		
USW64-1190	P,TP,LN			4897	1.2		1.4	11.0	29.5	58.0		
USW64-1244	P,TP,LN			5125	2.6		1.4	23.0	15.0	48.0		
USW64-1282	P,TP,LN			5117	1.4		1.7	0.5	32.5	61.0		
USW64-1299	P,TP,AV			4960	3.2		1.0	5.0	19.0	70.0		
USW64-1311	P,TP,AV			4971	3.1		1.1	12.0	20.0	64.0		
USW64-1331	P,TP,LV			10133	1.9		1.0	16.0	34.0	42.0		

Appendix 3—Table 5

Sample number	Mafic Phenocrysts Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenocrysts Opq	Opaque type	Opq size (mm)	Opq (%)	Analyzer, date
USW G4-241.6	7.1																		4.9	
USW G4-307.6	7.6																		0.9	
USW G4-383	0.6																		1.9	
USW G4-410	1.7																		1.7	
USW G4-416	0.9																		1.4	
USW G4-447	3.4																		0.0	
USW G4-500.9	11.0																		2.0	
USW G4-514	3.0																		3.0	
USW G4-556	2.0																		0.0	
USW G4-625	1.5																		4.0	
USW G4-625.7	6.0																		5.0	
USW G4-677	5.0																		12.0	
USW G4-694	7.0																		1.0	
USW G4-746	2.0																		6.0	
USW G4-817	1.0																		5.0	
USW G4-934	3.0																		2.0	
USW G4-1026	6.0																		2.0	
USW G4-1089	6.0																		7.0	
USW G4-1117	5.0																		6.0	
USW G4-1190	0.0																		1.5	
USW G4-1244	7.0																		3.0	
USW G4-1282	1.0																		5.0	
USW G4-1299	3.0																		3.0	
USW G4-1311	3.0																		1.0	
USW G4-1331	5.0																		1.0	

Appendix 3--Table 6
Modified from Broxton and others, 1989

Loc	Sample number	Fm, Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts: Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
99	FBPP-6	P,TC,UP	V		300	9.7			2.0	54.0	45.0		
100	FBPP-7	P,TC,UP	V		275	1.8			0.0	83.0	12.0		
	UE25P#1-210	P,TC,UP	DA			0.0			0.0	95.0	5.0		
101	RW31a-1	P,TC,LW	DWT		512	0.0			0.0	99.0	1.0		
	J13-427	P,TC,LW	DWT		300	0.0			0.0	100.0	0.0		
	UE25P#1-270	P,TC,LW				0.0			0.0	100.0	0.0		
	UE25P#1-290	P,TC,LW				0.0			0.0	100.0	0.0		
	UE25A1-226.2	P,PC	NWT		404	1.7			0.0	38.0	62.0		
	USWG2-501	P,PC	NWT		6926	0.4			2.0	38.0	60.0		
	USWG2-547	P,PC	NWT		6725	0.7			2.0	45.0	53.0		
	USWG2-561	P,PC	NWT		6690	0.5			4.0	37.0	59.0		
	USWG2-584	P,PC	PWT		7211	2.7			1.0	34.0	66.0		
	USWG2-627	P,PC	PWT		6414	0.6			5.0	31.0	64.0		
	USWG2-675	P,PC	PWT		6445	2.4			4.0	42.0	54.0		
	USWG2-723	P,PC	NWT		6626	2.0			1.0	55.0	44.0		
36	AGE-2B	P,TP,UP	DWT		2351				1.0	68.0	31.0		
36	AGE-2A	P,TP,UP	V		2809				<1	65.0	35.0		
102	11-102-76	P,TP,UP	DWT		2500				1.0	72.0	27.0		
102	11-102-7F	P,TP,UP	DWT		3400				2.0	59.0	39.0		
	UE25A1-251.0	P,TP,UP	B		442	4.3			0.0	70.0	30.0		
	UE25A1-277.0	P,TP,UP	DWT		430	1.9			0.0	66.0	34.0		
	J13-608	P,TP,UP	B		300	6.7			10.0	48.0	42.0		
	J13-801	P,TP,UP	DWT		300	0.9			0.0	62.0	38.0		
102	11-102-7B-A	P,TP,LW	DWT		3400				0.0	43.0	57.0		
102	11-102-7C	P,TP,LW	DWT		3500	0.0			<1	50.0	50.0		
102	11-102-7E	P,TP,LW	DWT		3500	0.0			8.0	42.0	50.0		
103	RW25p-1	P,TP,LW	B		1881	0.0			0.0	39.0	61.0		
104	SC-1B	P,TP,LW	DWT		6500	0.0			<1	36.0	64.0		
36	To41-C	P,TP,LW	DWT		6070	0.0			<1	18.0	82.0		
	UE25P#1-420	P,TP,LW	DWT			0.0			0.0	52.0	48.0		
	UE25P#1-580	P,TP,LW	DWT			0.1			0.0	56.0	4.0		
	UE25P#1-910	P,TP,LW	DWT			0.4			8.0	41.0	50.0		
	UE25P#1-1050	P,TP,LW	DWT			11.3			5.0	49.0	46.0		
	UE25P#1-1150	P,TP,LW	V			2.1			20.0	32.0	49.0		
105	3-15-82-5	CH,UP	NWT		4645	3.1			35.0	32.0	33.0		
105	3-15-82-6	CH,UP	NWT		4274	6.2			34.0	30.0	36.0		
105	3-15-82-7	CH,UP	NWT		4576	1.0			43.0	26.0	31.0		
105	3-15-82-8	CH,UP	NWT		4607	1.0			49.0	30.0	21.0		
105	3-15-82-9	CH,UP	NWT		4722	0.8			22.0	26.0	51.0		
106	4-16-85-3A	CH,UP	L		5319	0.0			50.0	33.0	16.0		
106	4-16-85-4	CH,UP	NWT		4994	4.7			50.0	22.0	28.0		
106	4-16-85-5	CH,UP	L		5210	0.2			44.0	23.0	33.0		
106	4-16-85-6	CH,UP	L		5297	0.0			38.0	50.0	12.0		
106	4-16-85-8	CH,UP	B		5164	2.6			25.0	43.0	32.0		
106	4-16-85-9	CH.UP	L		5193	0.0			14.0	29.0	57.0		

Appendix 3--Table 6 (continued)

Loc	Sample number	Mafic Phenocrysts									Accessory Phenocrysts						Opaque Phenocrysts				Analyzer. date
		Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Sp	Al	Ap	Zr	Other	Acc (%)	Opq	Opaque type	Opq size (mm)	Opq (%)	
99	FBPP-6	0.5	tr	0.2							tr	0.0	tr	tr							
100	FBPP-7	0.6	tr	0.5							tr	0.0	tr	tr							
	UE25P#1-210	0.5	0.0	0.4		0.0					tr	0.0		tr							
101	RW31a-1	tr	tr	0.0		0.0					tr	0.0	tr	tr							
	J13-427	tr		0.0		0.0						0.0		tr							
	UE25P#1-270	tr	0.0	0.0		0.0					tr			tr							
	UE25P#1-290	0.0	0.0	0.0		0.0					tr	0.0		tr							
	UE25A1-226.2	0.2	tr	0.0		0.0					tr	0.0	tr	tr							
	USWG2-501	0.3	0.0	tr		0.0					tr	0.0		tr							
	USWG2-547	0.4	0.0	tr		0.0					tr	0.0		tr							
	USWG2-561	0.4	0.0	tr		0.0					tr	0.0		tr							
	USWG2-584	0.5	0.0	tr		0.0					tr	0.0	tr	tr							
	USWG2-627	0.5	0.0	tr		0.0					tr	0.0	tr	tr							
	USWG2-675	0.3	0.0	tr		0.0					tr	0.0	tr	tr							
	USWG2-723	0.3	0.0	tr		0.0					tr	0.0	tr	tr							
36	AGE-2B	0.8	tr	0.1		0.0					tr	0.0									
36	AGE-2A	0.7	tr	0.2		0.0					tr										
102	11-102-76	0.3	0.0	0.2		0.0					0.0										
102	11-102-7F	0.1	0.0	0.0		0.0					0.0										
	UE25A1-251.0	0.9	0.0	0.1		0.0					0.0	0.0	tr	tr							
	UE25A1-277.0	0.7	0.0	0.3		tr					0.0	0.0	tr	tr							
	J13-608	0.1	0.0	0.0		0.0					0.0	0.0	tr	tr							
	J13-801	0.2	0.0	0.0		0.0					0.0	0.0	tr	tr							
102	11-102-7B-A	tr	0.0	0.0		0.0					0.0										
102	11-102-7C	tr	0.0	0.0		0.0					0.0										
102	11-102-7E	0.1	0.0	0.0		0.0					0.0										
103	RW25p-1	tr	tr	0.3		0.0					0.0	0.0	tr	tr							
104	SC-1B	tr	0.0	0.0		0.0					0.0										
36	To41-C	tr	0.0	0.0		0.0					0.0										
	UE25P#1-420	0.1	0.0	0.0		0.0					0.0	0.0		tr							
	UE25P#1-580	0.0	0.0	0.0		0.0					0.0	0.0		tr							
	UE25P#1-910	0.0	0.0	0.0		0.0					0.0	tr		0							
	UE25P#1-1050	tr	0.0	0.0		0.0					0.0	0.0		0							
	UE25P#1-1150	0.2	0.0	0.0		0.0					0.0	0.0		0							
105	3-15-82-5	tr	0.0	0.0		0.0					0.0	0.0									
105	3-15-82-6	tr	0.0	0.0		0.0					0.0	tr									
105	3-15-82-7	tr	0.0	0.0		0.0					0.0	0.0									
105	3-15-82-8	tr	0.0	0.0		0.0					0.0	0.0									
105	3-15-82-9	0.2	0.0	0.0		0.0					0.0	tr									
106	4-16-85-3A	0.3	0.0	0.0		0.0					0.0	tr									
106	4-16-85-4	tr	0.0	0.0		0.0					0.0	tr									
106	4-16-85-5	tr	0.0	0.0		0.0					0.0	tr									
106	4-16-85-6	tr	0.0	0.0		0.0					0.0	tr									
106	4-16-85-8	tr	tr	0.0		0.0					0.0	0.0									
106	4-16-85-9	0.2	0.0	0.0		0.0					0.0	tr									

Appendix 5--Table 6 (continued)

Loc	Sample number	Mafic Phenocrysts: Bi	Hb	Cx	Px	Ox	Ac	Other	Maf size (mm)	Mafic (%)	Accessory Phenocrysts: Sp	Al	Ap	Zr	Other	Acc (%)	Opaque Phenocrysts: Opq	Opaque type	Opq size (mm)	Opq (%)	Analyzer, date
106	4-16-85-12	tr	0.0	0.0		0.0					0.0	tr									
107	82FB-1	0.6	0.0	0.0		0.0					0.0	0.0		tr							
107	82FB-2	0.2	0.0	0.0		0.0					0.0	0.0		0							
107	82FB-3A	0.6	0.0	0.0		0.0					0.0	0.0		tr							
107	82FB-3B	0.7	tr	0.0		0.0					0.0	0.0		tr							
108	DB28b-15	tr	0.0	tr		tr					tr	tr	tr	tr							
105	3-15-82-1	1.3	0.0	0.0		0.0					0.0	tr									
105	3-15-82-3	0.2	0.0	0.0		0.0					0.0	0.0									
	UE25P#1-2380	tr	tr	0.0		0.0					0.0	0.0		tr							
	UE25P#1-2660	0.4	0.0	0.0		0.0					0.0	0.0		tr							
	UE25P#1-2760	0.3	0.0	0.0		0.0					0.0	0.0		tr							
109	RWBWa-4	0.2	0.1	0.0		0.0					0.0	0.0	tr	tr							
110	TW8-479	0.1	0.1	0.0		0.0					tr	0.0	tr	tr							
111	TSV-417A-82	tr	tr	tr		tr					tr	0.0	tr	tr							
112	FB16a-8	0.1	1.3	0.0		0.0					tr	0.0	tr	tr							
	USWG2-4199	0.8	0.0	0.0		0.0					tr	0.0	tr	tr							
	USWG2-4267	0.4	0.0	0.0		0.0					tr	0.0	0	tr							
	USWG2-4467	0.1	0.0	0.0		0.0					tr	0.0	tr	tr							
	UE25F#1-2950	0.4	0.0	0.0		0.0					tr	tr		tr							
	UE25F#1-3453.3	0.2	0.0	0.0		0.0					tr	0.0									
	UE25F#1-3570	0.3	0.0	0.0		0.0					tr	0.0		tr							
	UE25F#1-3600	0.2	0.0	0.0		0.0					0.0	0.0		tr							
	UE25F#1-3640	1.5	0.0	0.0		0.0					0.0	0.0	0	tr							
	UE25F#1-3670	1.1	0.2	0.0		0.0					0.0	0.0	0	tr							
	UE25F#1-3730	1.6	0.3	0.0		0.0					tr	0.0	0	tr							

Appendix 3--Table 5 (continued)
Modified from Broxton and others, 1989

Loc	Sample number	Fm,Mbr, Unit	Rock type	Age (m.y.)	Pts ctd	Lith (%)	Lithic type	Phen (%)	Felsic Phenocrysts: Qtz (%)	AK-F (%)	Plag (%)	Plag comp	Fels size (mm)
106	4-16-85-12	CH,UP	L		5779	0.0			30.0	51.0	20.0		
107	82FB-1	CH,LW	NWT		1580	3.9			37.0	26.0	37.0		
107	82FB-2	CH,LW	NWT		1595	9.5			28.0	19.0	53.0		
107	82FB-3A	CH,LW	NWT		5400	4.0			26.0	22.0	52.0		
107	82FB-3B	CH,LW	NWT		5200	7.1			31.0	26.0	42.0		
108	DB28b-15	CH,LW	B		338	5.3			40.0	13.0	47.0		
105	3-15-82-1	CH,LW	NWT		553	18.8			23.0	67.0	10.0		
105	3-15-82-3	CH,LW	B		2374	3.3			33.0	33.0	34.0		
	UE25P#1-2380	CF,TR				3.1			33.0	45.0	22.0		
	UE25P#1-2660	CF,TR				10.5			29.0	26.0	45.0		
	UE25P#1-2760	CF,TR				9.5			33.0	35.0	32.0		
109	RWBWa-4	LR	NWT		467	18.7			3.0	39.0	58.0		
110	TW8-479	LR	PWT		573	5.6			0.0	45.0	55.0		
111	TSV-417A-82	LR	PWT		489	3.7			4.0	32.0	64.0		
112	FB16a-8	LR	NWT		1997	2.3			8.0	21.0	70.0		
	USWG2-4199	LR	MWT		1900	4.7			0.0	0.0	100.0		
	USWG2-4267	LR	NWT		1750	7.8			4.0	35.0	61.0		
	USWG2-4467	LR	NWT		1900	11.2			10.0	29.0	62.0		
	UE25P#1-2950	LR				13.3			4.0	35.0	61.0		
	UE25P#1-3453.3	LR				11.7			3.0	20.0	77.0		
	UE25P#1-3570	OG1-A				1.2			32.0	30.0	37.0		
	UE25P#1-3600	OG1-A				1.9			21.0	38.0	41.0		
	UE25P#1-3640	OG1-C				7.0			1.0	5.0	94.0		
	UE25P#1-3670	OG1-C				10.5			1.0	2.0	97.0		
	UE25P#1-3730	OG1-C				9.0			0.0	2.0	98.0		

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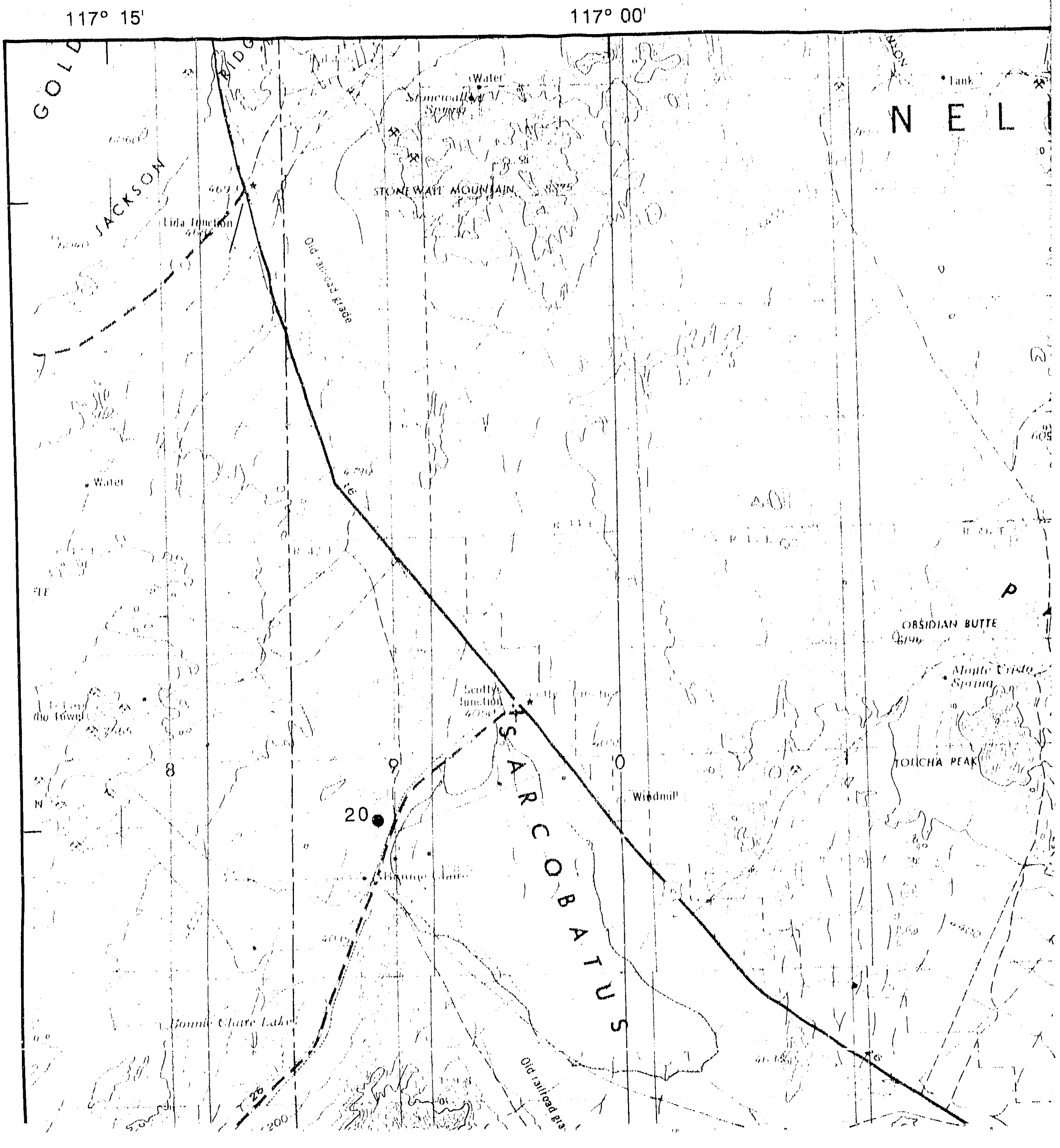
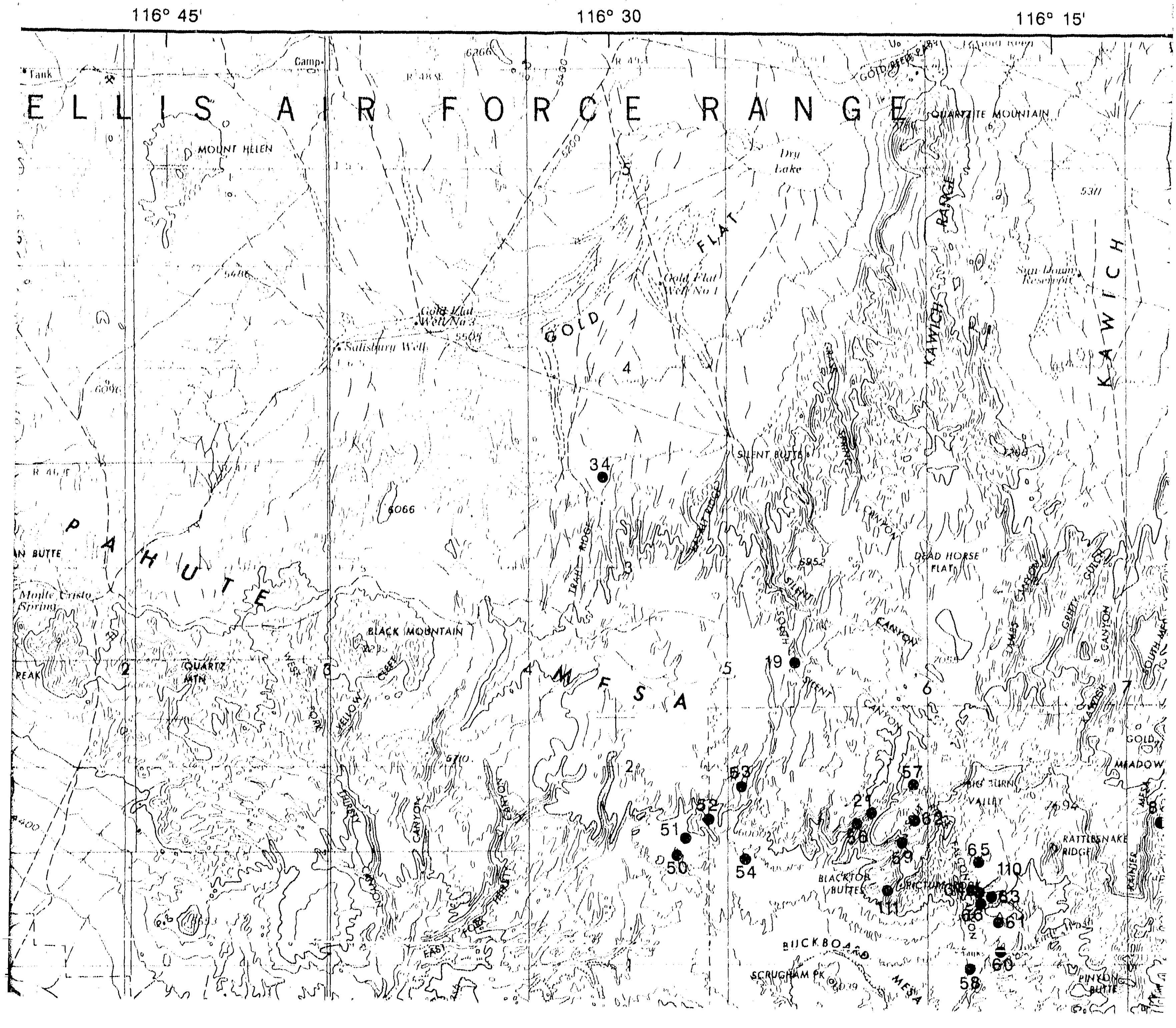
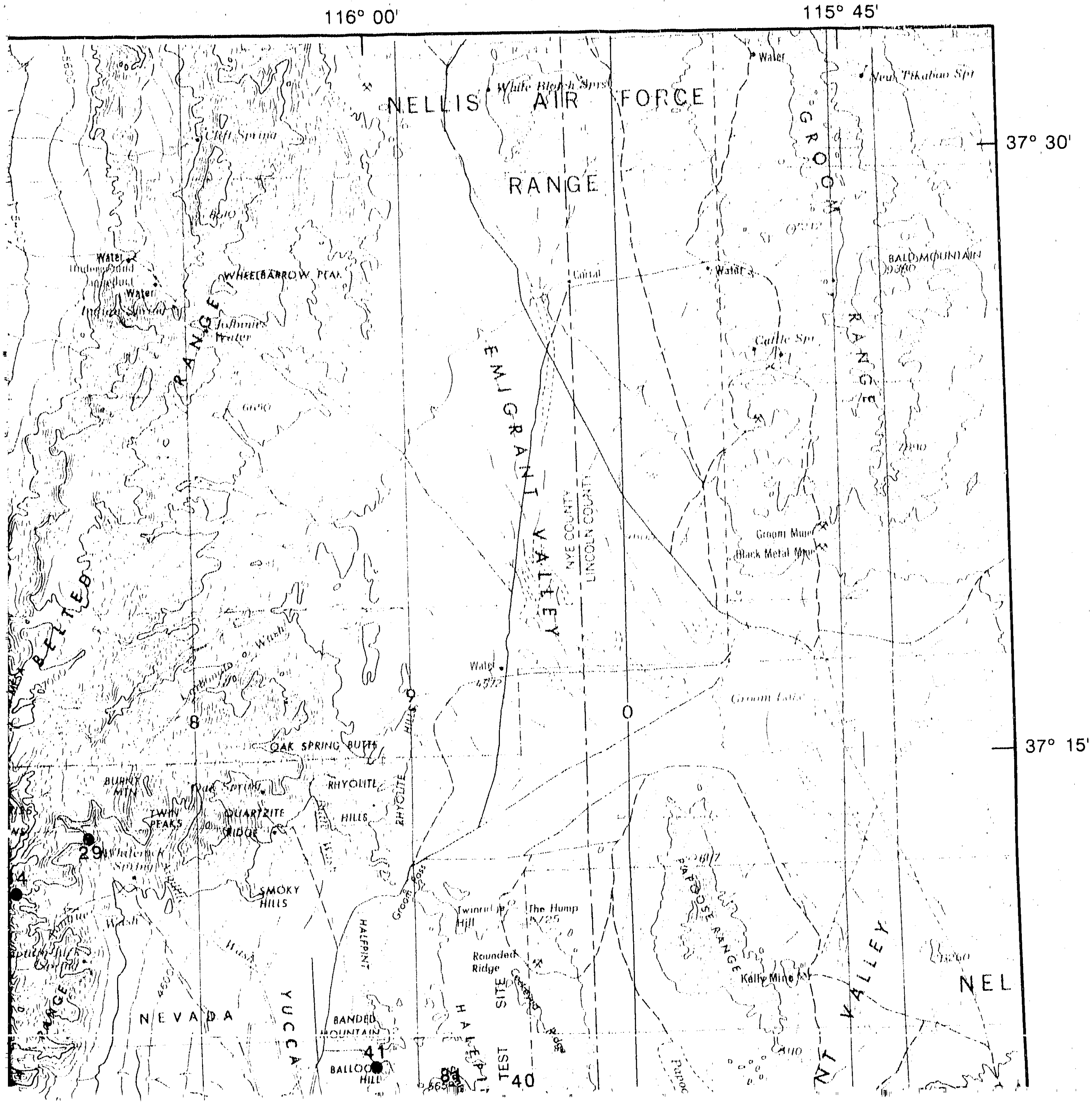
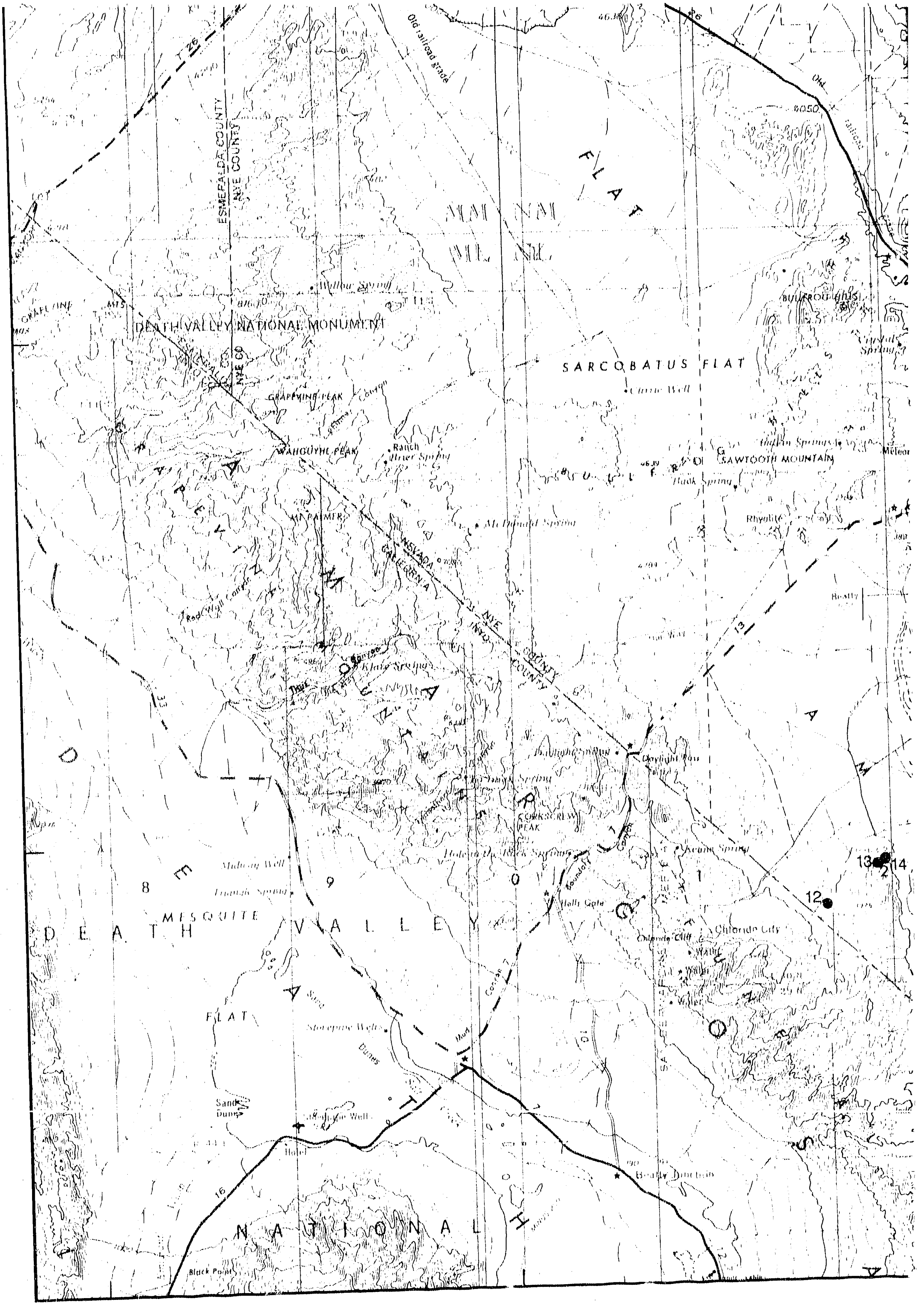


Prepared in cooperation with
the U.S. Department of Energy



Open-File Report
90-87
Plate 1





Old railroad grade
ESMERALDA COUNTY
NYE COUNTY
FLAT
DEATH VALLEY NATIONAL MONUMENT
NYE CO
SARCOBATUS FLAT
GRAPEVINE PEAK
WAHGUYHE PEAK
SAWTOOTH MOUNTAIN
BULLFROG HILLS
Rhyolite
Beatty
NEVADA
CALIFORNIA
NYE COUNTY
INYO COUNTY
Daylight Pass
CORKSCREW PEAK
Hells Gate
Chloride City
Midway Well
MESQUITE
DEATH VALLEY
FLAT
Stovepipe Wells
Dunes
Sand Dunes
Hotel
Beatty Junction
NATIONAL
Black Point
8
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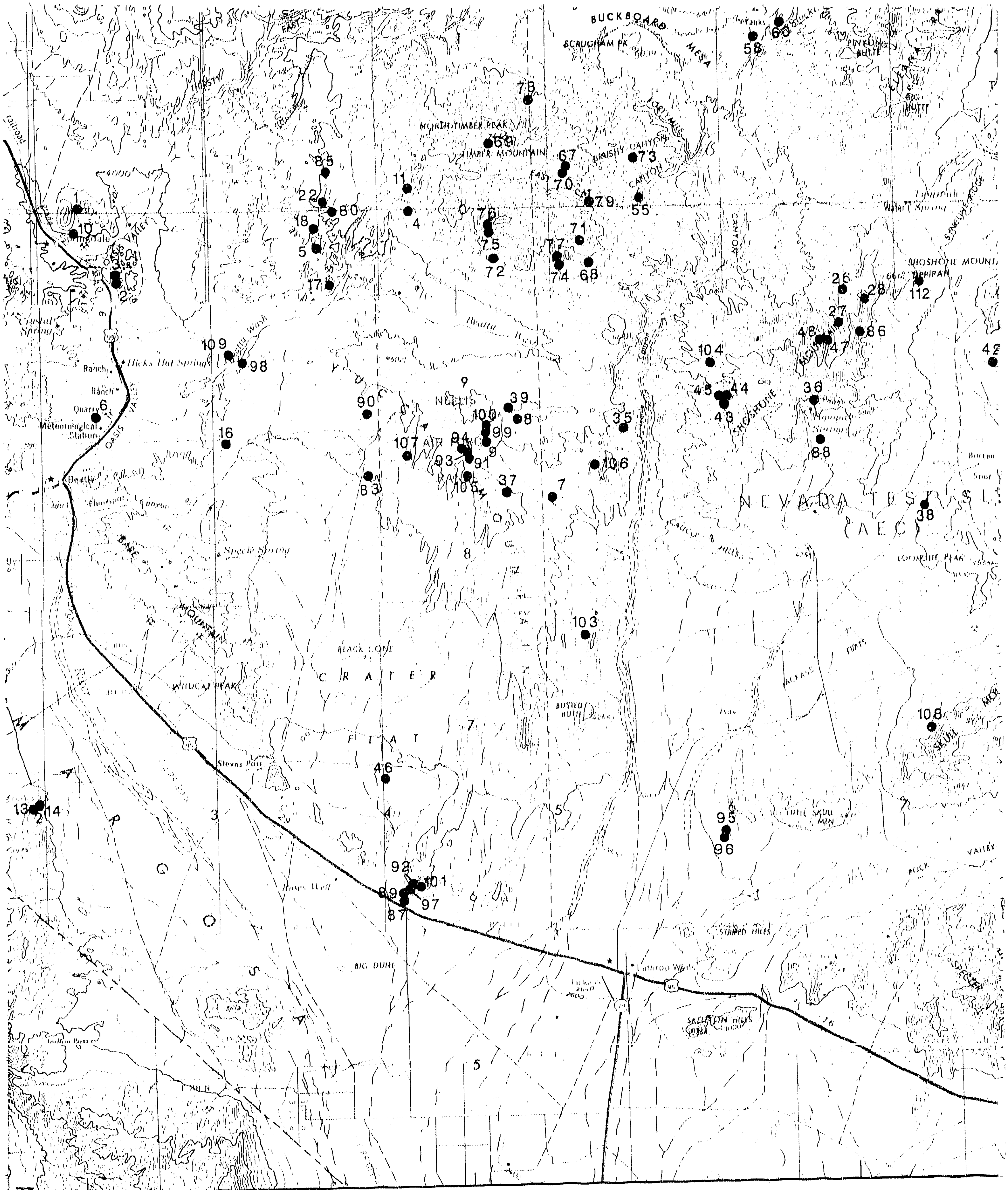
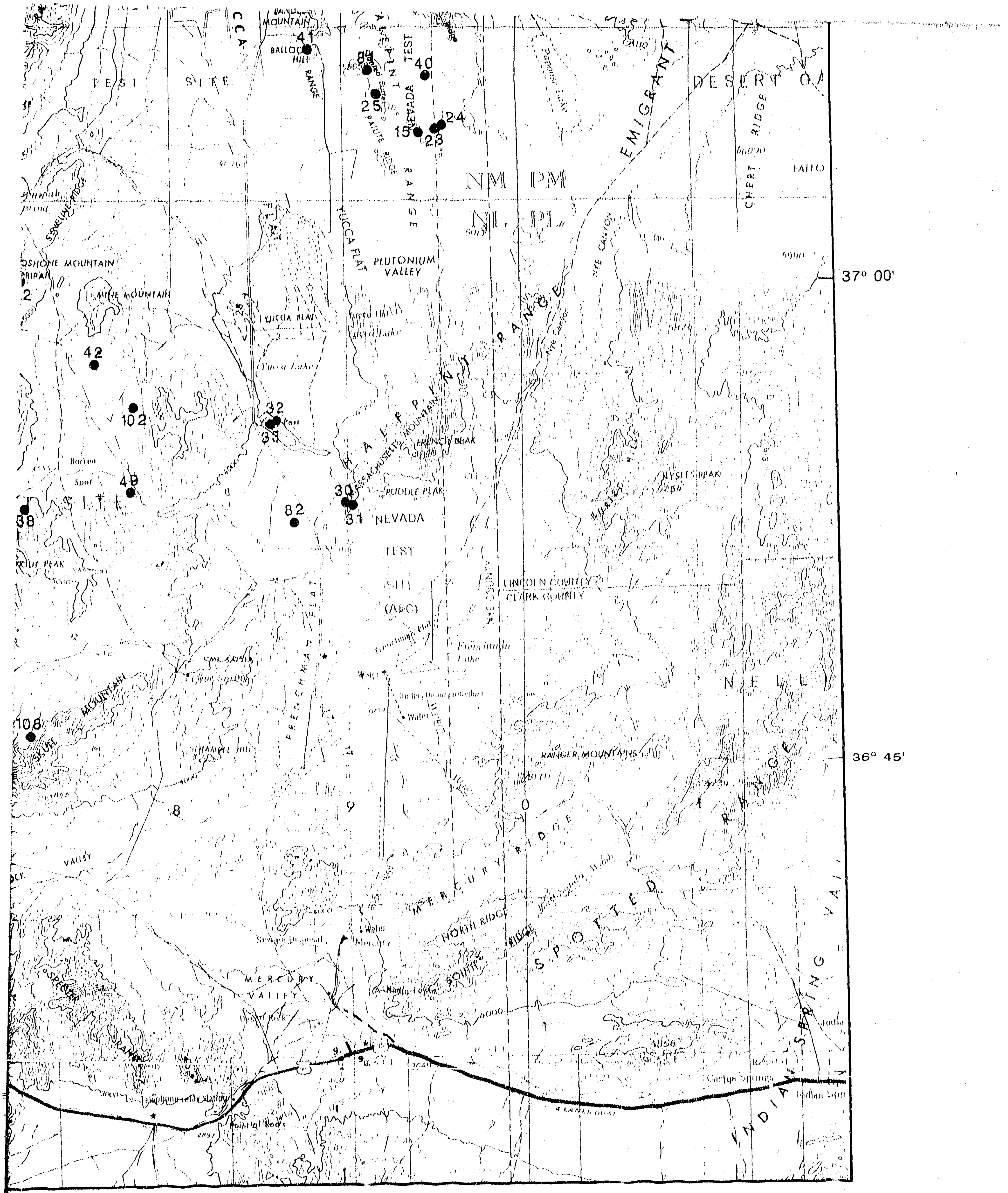


BUCKBOARD MESA
SCRUGHAM PK
NORTH TIMBER PEAK
TIMBER MOUNTAIN
BRUSHY CANYON
Springdale
Crystal Spring
Hicks Hot Spring
Ranch
Quarry
Meteorological Station
OASIS VALLEY
Beatty
Beatty Wash
NELLIS AIR RANGE
Specie Spring
BLACK CONE
CRATER FLAT
WILDCAT PEAK
Stevens Pass
Roses Well
BIG DUNE
Lathrop Wells
SKELETON HILLS
STRIPED HILLS
LITTLE SKULL MTN
ROCK VALLEY
NEVADA TEST SITE (AEC)
SHOSHONE MOUNTAIN
LOOKOUT PEAK
Topopah Spring
JACKASS FLATS
Indian Pass



37° 00'
36° 45'
TEST SITE
NEVADA TEST SITE (AEC)
DESERT
EMIGRANT
CHERT RIDGE
NM PM
NL PL
PLUTONIUM VALLEY
YUCCA FLAT
SHOSHONE MOUNTAIN
MINE MOUNTAIN
HALFPINT RANGE
MASSACHUSETTS MOUNTAIN
FRENCH PEAK
PUDDLE PEAK
LINCOLN COUNTY
CLARK COUNTY
FRENCHMAN FLAT
NYE CANYON
RANGER MOUNTAINS
MERCURY RIDGE
SPOTTED RANGE
NORTH RIDGE
SOUTH RIDGE
MERCURY VALLEY
Mercury
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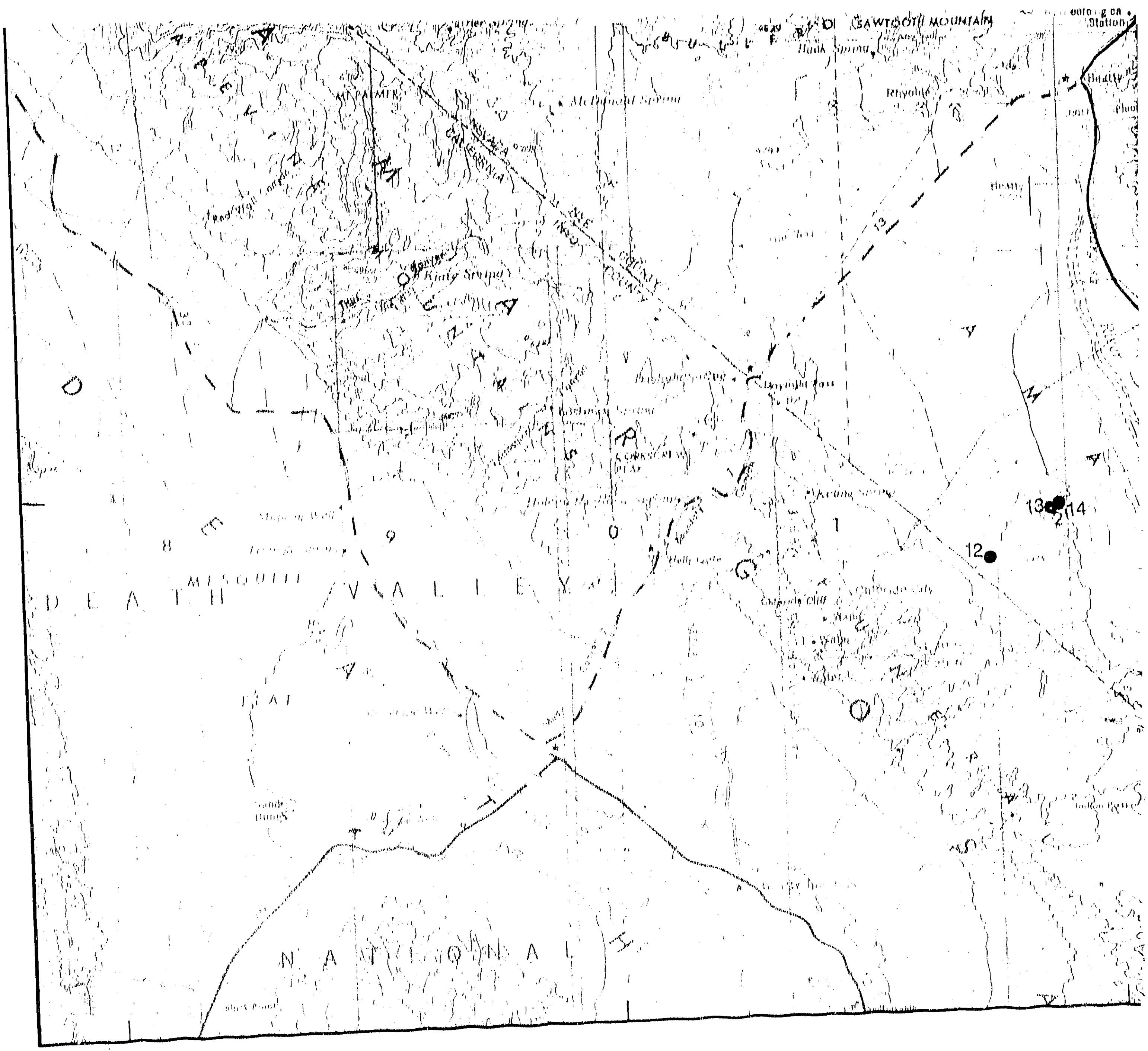
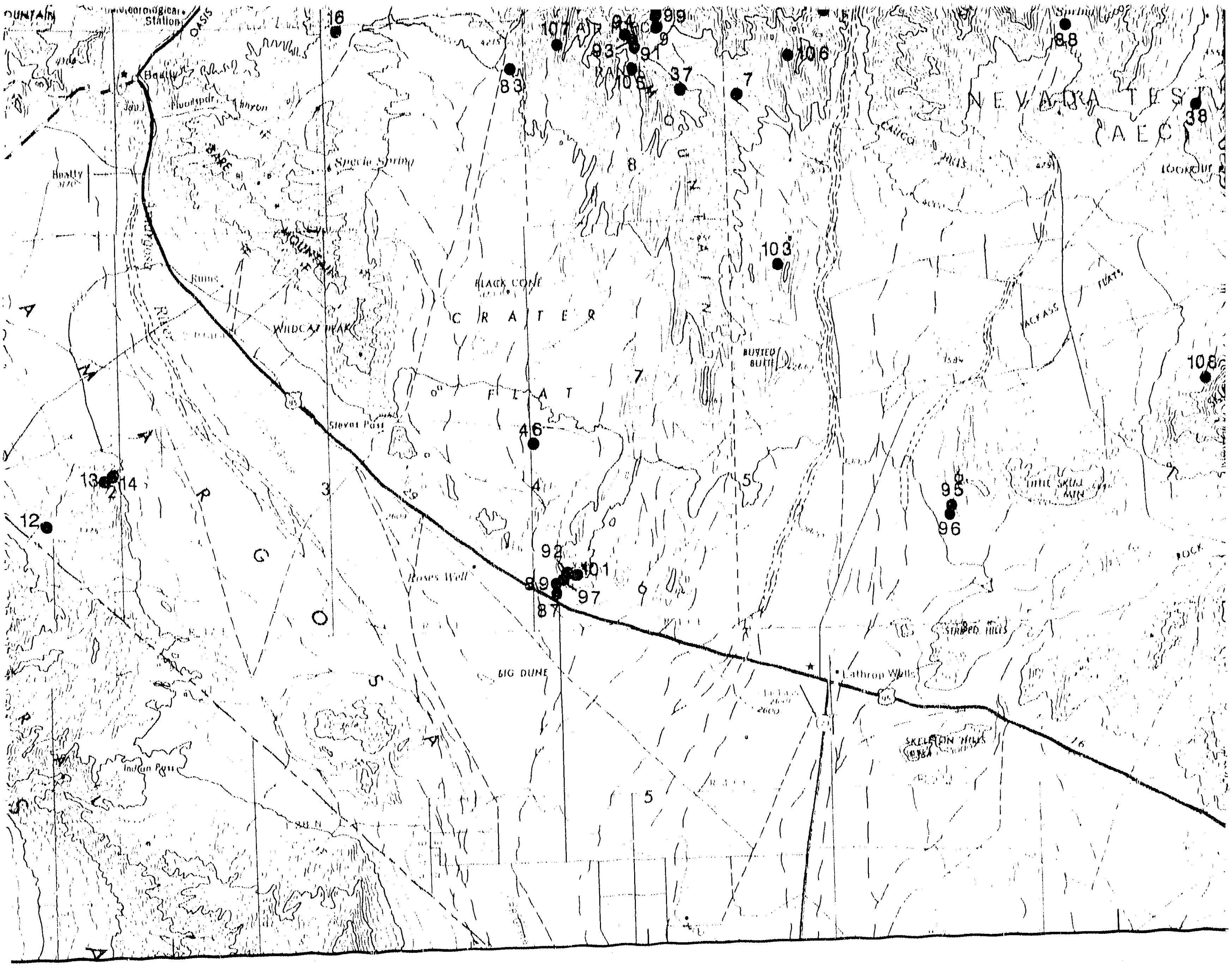


EXPLANATION

12 • Number and location of sample listed in Appendices 2 an

LOCATIONS (



SCALE 1:250 000

5 0 5 10

5 0 5 10 15 KILOMETERS

CONTOUR INTERVAL 200 FEET

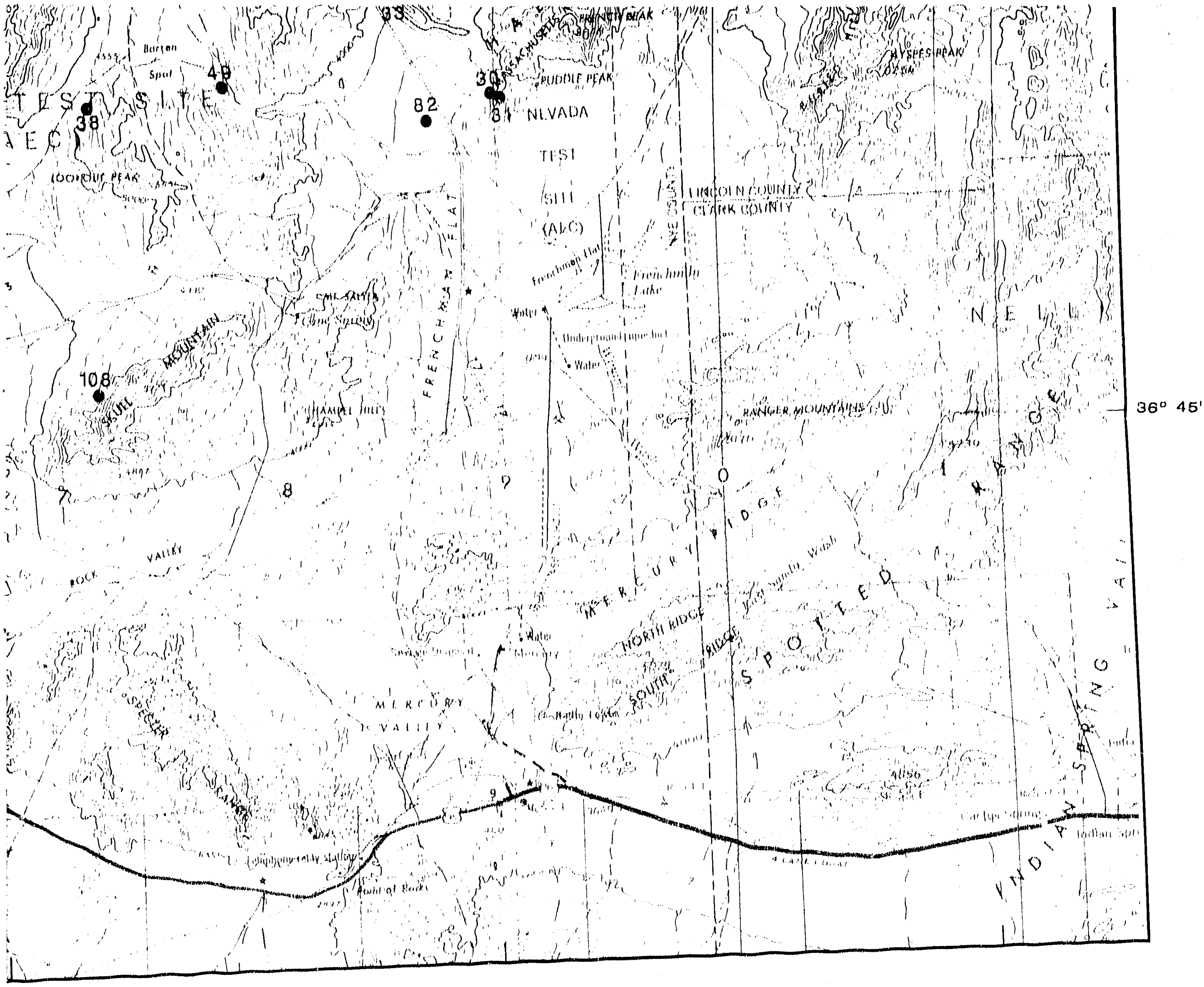
WITH SUPPLEMENTARY CONTOURS AT 100-FOOT INTERVALS

DATUM IS MEAN SEA LEVEL

1974 MAGNETIC DECLINATION VARIES FROM 13°30′ TO 12°30′ EAST

ıdices 2 and 3

ıTIONS OF OUTCROP SAMPLES FROM THE NEVADA TEST



15 MILES

5 KILOMETERS

LS

EAST

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

TEST SITE AREA, NYE COUNTY, NEVADA

END

DATE FILMED

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