1990

Depositional history at a site in the northwestern Gulf of Mexico revealed by tephrochronology and oxygen isotope stratigraphy

Cynthia Louise Brown
San Jose State University

Order Number 1342700

Depositional history at a site in the northwestern Gulf of Mexico revealed by tephrochronology and oxygen isotope stratigraphy

Brown, Cynthia Louise, M.S.

San Jose State University, 1990

U·M·I
300 N. Zeeb Rd.
Ann Arbor, MI 48106

DEPOSITIONAL HISTORY AT A SITE IN THE NORTHWESTERN GULF OF MEXICO REVEALED BY TEPHROCHRONOLOGY AND OXYGEN ISOTOPE STRATIGRAPHY

A Thesis

Presented to

The Faculty of the Department of Geology

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

By

Cynthia Louise Brown

December, 1990

APPROVED FOR THE DEPARTMENT OF GEOLOGY

Dr. Michael Ledbetter

Dr. David Andersen

Dr. Jenny Metz

APPROVED FOR THE UNIVERSITY

ACKNOWLEDGEMENTS

This thesis would not have been completed without the time and encouragement provided by Jeff Brown and Mary Ellen and Allen Benson. Joe Wooden at the U. S. Geological Survey provided the laboratory space needed for some of the sample preparation. Dick Tosdal at the U. S. Geological Survey provided the computer for the editing and printing of this thesis. Ken Bork, Jeff Muller, Carol Ostergren, and Bob Fehr assisted in some of the sample preparation. Sample analysis on the electron-microprobe was done by Charles Meyer at the U. S. Geological Survey. Michael Ledbetter, David Andersen and Jenny Metz provided critical comments and valuable suggestions in reviewing this manuscript. Drafting of most of the figures was done by Lynn McMasters at Moss Landing Marine Laboratories. I thank you all.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

ABSTRACT

Microprobe analyses of tephra have been used in conjunction with oxygen isotope ($\partial^{18}O$) and seismic reflection data in a sedimentary study of the 1000 foot-long deep-sea core E67-113 from the northwestern Gulf of Mexico (longitude 95°54'W, latitude 27°28'N). The core is composed mainly of clay with few silt and sand laminae and sections rich in foraminifera. No megascopic tephra layers are found in this core, but electron-microprobe analysis of glass shards (38-63 μm) from five intervals of dispersed rhyolitic tephra indicate that the tephra are both heterogeneous and altered. Extensive hydration and mobility of iron and other ions into carbonate material hinder accurate geochemical fingerprinting. The coincidence of intervals of dispersed tephra with sections of the core composed mainly of terrigenous material suggests that the tephra were reworked from land deposits and redeposited via fluvial systems in the Gulf.

Volcanic tephra widespread in the region are absent from core E67-113. The oxygen isotope stratigraphy in the core indicates two hiatuses, one from 0 - 0.093 million years and the other from 0.12 - 1.2 million years. A discrete tephra layer found in another core (E67-126A) in the same region is geochemically and biostratigraphically correlated with the Lava Creek rhyolitic eruption from Yellowstone (0.6 $\pm$ 0.02 million years). This tephra layer, as well as many other region-wide tephra, fall into the missing time spans in E67-113. Therefore, the absence of discrete tephra layers in core E67-113 was due to deep-sea erosional processes that removed sediment at the core site. The seismic reflection data show that core E67-113 was drilled in a channel adjacent to a large salt diapir. This channel cuts into onlapping sediments. As the diapir ascended through the overlying sediments, bottom currents in the Gulf were diverted around the diapir, eroding significant amounts of sediment while creating a channel or moat.

INTRODUCTION

Marine tephra layers are useful time stratigraphic markers because of their widespread distribution and geologically "instantaneous" deposition (Kennett, 1981). There are numerous ways to date marine tephra in deep sea sediments. In earlier studies, the biostratigraphy and oxygen isotope stratigraphy were determined first, and used to give a relative age for distinctive ash layers in sedimentary cores (Kennett and Huddlestun, 1972; Thunell, 1976). Chemical correlations of marine tephra layers with terrestrial sources allow tephrochronology to be used as a primary stratigraphy (Ledbetter, 1984). This method can be quicker and more accurate than biostratigraphy and oxygen isotope stratigraphy, and can be applied to dispersed ash zones as well as layers in a core.

A number of widespread, megascopic and dispersed tephra layers have been found throughout the western Gulf of Mexico, and have been studied by several authors (Kennett and Huddlestun, 1972; Thunell, 1976; Rabek and others, 1985; Ledbetter, 1985). The most common megascopic layers, W1, Y8 and Y6, were named and correlated by Kennett and Huddlestun and Thunell based on the biostratigraphic subzone in which they occur. The definition of these subzones is based on the distinct planktonic foraminifera zones within the Pleistocene zonation of Ericson and Wollin (1968), and the zones are correlated with oxygen isotope stratigraphy. Rabek and others (1985) have determined the chemical composition of these layers (and dispersed tephra horizons X2, W2, and Y5) in the Gulf and correlated them with the layers of Kennett and Huddlestun and Thunell based on the tephra stratigraphy. Chemical analysis can also be used to correlate marine tephra with terrestrial sources and thus an absolute, rather than relative, age may be determined in many cases. In other instances, correlation of the terrestrial ash with a marine tephra layer in a well-dated core may be used to date the terrestrial ash. For example, the Y8 layer is correlated with the Los Chocoyos eruption in Guatemala (Drexler and others, 1980), which

is correlated with another marine tephra layer, the Worzel-D layer, found in the Pacific Ocean (Bowles and others, 1973), and an age of 84 ka was determined.

The Los Chocoyos Ash is the most widely distributed tephra in the Gulf of Mexico (Drexler and others, 1980) (fig. 1). It is the result of just one of many eruptions producing large volumes of silicic ash during the Pleistocene in western North America, Mexico and Central America. Table 1 lists other large eruptions that could be expected to extend to the northwestern Gulf. The volumes of these eruptions, their proximity to the Gulf (fig. 1), and the general prevailing wind patterns, indicate the Gulf of Mexico as a possible location for deposition of the tephra in table 1. One of those, the Lava Creek B tephra, is found as a discrete tephra layer in a core (E67-126A) from the same region as the core used in this study (C. L. Ostergren, 1989, personal communication).

The purpose of the study is to apply tephrostratigraphic techniques to determine the stratigraphy of deep sea core E67-113 from the northwest Gulf of Mexico. Location and identification of tephra in the core were difficult due to sedimentological processes in the area. Salt diapirism in the area creates an increased saline environment, affecting the chemistry of the immediately surrounding sediments and causing alteration of the volcanic ash. Salt diapirs also disrupt the depositional environment by enhancing erosion, slumping, and sliding. Oxygen isotope stratigraphy for a portion of the core (upper 40%) and seismic-reflection profiles of the core and the surrounding region provide the necessary information to identify these sedimentological processes at the core site.

Geologic History of the Gulf of Mexico

The Gulf of Mexico began to form during the Late Paleozoic. Oceanic crust beneath the abyssal gulf developed by rifting and sea floor spreading. This formed an epicontinental sea in the Jurassic where thick layers of salt were deposited. The oceanic

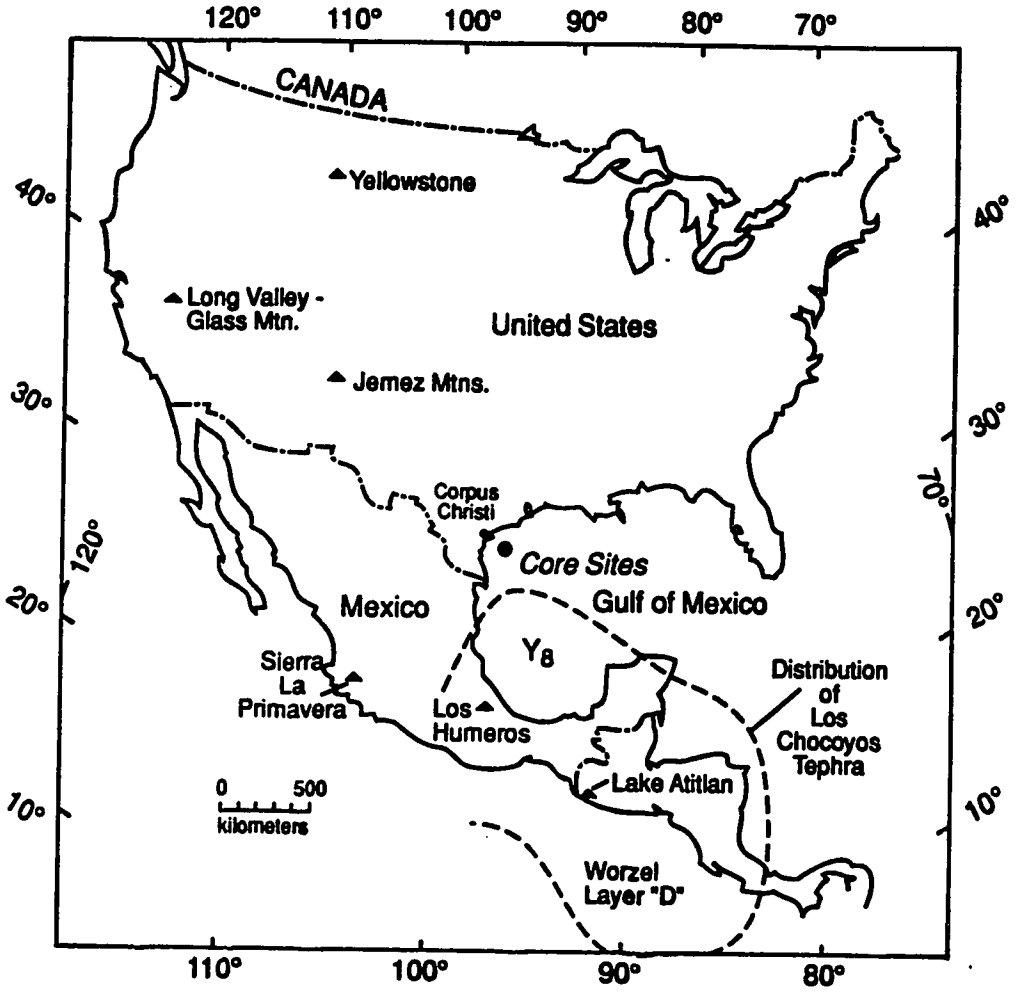

Figure 1. Index map showing the locations of the Late Pliocene and Pleistocene eruptions listed in table 1, the locations of cores E67-113 and E67-126A (Core Sites), and the distribution of the Los Chocoyos tephra from Lake Atitlan. This tephra has been correlated to the Y8 tephra that is present in the western Gulf of Mexico and the Worzel Layer "D" that is present in the eastern Pacific Ocean.

TABLE 1. LARGE VOLUME LATE PLIOCENE AND PLEISTOCENE VOLCANIC ERUPTIONS OF NORTH AMERICA, MEXICO, AND CENTRAL AMERICA

Eruption Unit or Ash Bed	Date	Source Location	Volume km^3	Reference
Huckleberry Ridge	2.01 Ma	Yellowstone, Wyoming	2000	Izett, 1981
Lava Creek B	0.61 Ma	Yellowstone, Wyoming	1000	Izett, 1981
Bishop Tuff	0.74 Ma	Long Valley Caldera, California	500	Izett, 1981
Tsankawi Upper Bandelier	1.15 Ma	Jemez Mountains, New Mexico	300	Izett, 1981
Guaje Lower Bandelier	1.47 Ma	Jemez Mountains, New Mexico	300	Izett, 1981
Los Chocoyos	84 ka	Lake Atitlan, Guatemala	200	Rose and others, 1981 Drexler and others, 1980
Faby Tuff	0.24 Ma	Los Humeros, Puebla, Mexico	40	Ferriz and Mahood, 1984
Tala Tuff	90 ka	Sierra La Primavera, Jalisco, Mexico	20	Mahood, 1980

crust continued to cool and subside until the late Cretaceous. By this time the Gulf had subsided by several kilometers. The Gulf became isolated by continuous growth of surrounding carbonate platforms, the Florida and Yucatan peninsulas (fig. 2), that formed in the Jurassic and Cretaceous. These are made of authigenic, shallow water carbonates and anhydrite (Wilhelm and Ewing, 1972). Low rates of sediment accumulation within the Gulf, together with the continued growth of these carbonate platforms around the Gulf, caused a deepening of the Gulf. Figure 2 shows the major geomorphic provinces and current patterns in the Gulf.

The primary current in the Gulf is the Florida Current. It forms from the Caribbean Current which enters the Gulf by the Yucatan Channel and exits by the Straights of Florida, and therefore is called the Loop Current. The Loop Current extends from the surface to the sea floor along the continental margins. The change in intensity of this current is recorded in sediments by the amount of winnowing observed. At approximately 3.1 Ma, there was a significant increase in the winnowing of the sediments, which continued in numerous cycles into the Pleistocene. This created an increasing number of hiatuses in the sediment record. This increase correlated with the closing of the Central American Passage at approximately 3.1 Ma, diverting most of the Caribbean Current into the Gulf, and later with the glacial-interglacial cycles, which began approximately 2.5 Ma (Late Pliocene), due to the major growth of the ice sheets on the northern continent (Brunner, 1984; Hodell and others, 1985).

The glacial-interglacial cycles that began in the late Pliocene continued into the Pleistocene with increased frequency and decreased duration. Productivity during the Pleistocene increased globally, especially during the glacials. This increase in productivity was due to an increase in current circulation both horizontally and vertically, creating

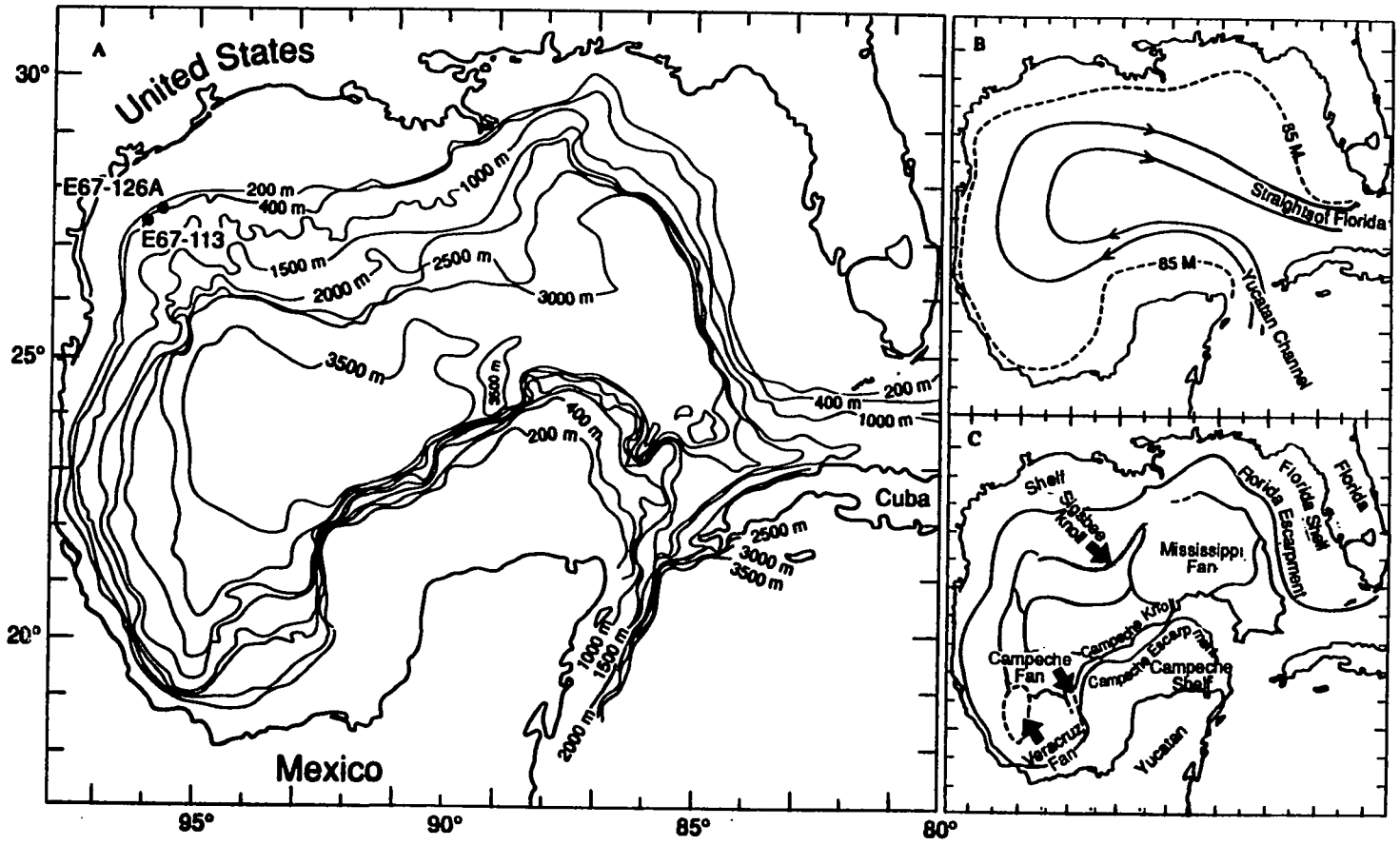

Figure 2. A. Bathymetric map of the Gulf of Mexico showing core locations; B. Major current pattern in the Gulf (after Brunner and Cooley, 1976); C. Major geomorphic provinces in the Gulf (after Wilhelm and Ewing, 1972).

greater upwelling. Terrigenous sediment accumulation rates also increased due to lowered sea level during glacial periods (Brunner,1984; Hodell and others, 1985).

Salt diapirs dominate the continental slope of the western Gulf of Mexico. The salt diapirs rise due to the density contrast between the less dense salt below and the denser overlying sediments. Diapiric activity increased during the Pleistocene due to the increased sediment accumulation. The salt diapirs form structural highs covered by sediments (Wilhelm and Ewing, 1972). The Sigsbee and Campeche Knolls are results of the extensive diapiric activity (fig. 2).

Today the Gulf is covered by a thin accumulation (approximately 20-50 cm) of foraminiferal ooze on the continental shelves, slopes, rises and abyssal plains as well as on the Mississippi Fan (Davies, 1972). The terrigenous sediments that enter the Gulf are deposited primarily in the western Gulf. This supply of terrigenous sediments also slightly increases productivity by bringing more nutrients into the western part of the Gulf (Jendrzcejewski and Hart, 1978). The present current pattern varies seasonally from spring to winter. In spring, the Caribbean Current impinges on the Gulf, creating the "spring intrusion." This current increases with time, and by the fall, begins to spread into the rest of the Gulf and is termed the "fall spreading." As the current begins to wane during the winter months, eddies are left in the western and northern Gulf (Leipper, 1970).

Geologic Setting of the Study Area

The continental slope in the northern Gulf of Mexico is dominated by salt ridges, domes, and spines, the emplacement and movement of which greatly affect the deposition of the sediments on the slope (fig. 3a). Those sediments are deposited by turbidity currents and hemipelagic sedimentation. Movement of the salt structures causes disruption of these sediments, such as slumping, sliding, faulting and erosion. Salt structures can also

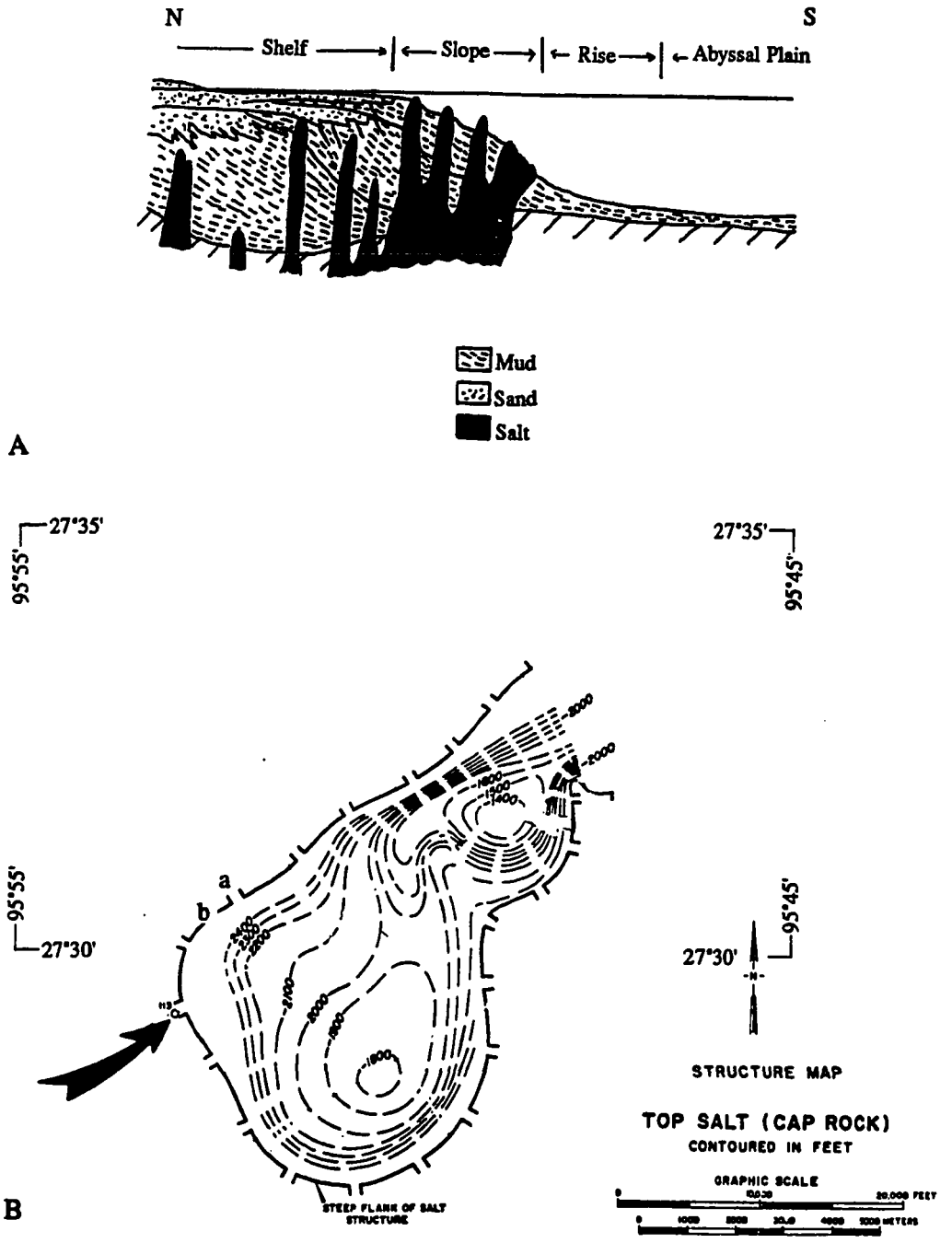

Figure 3. A. Schematic profile of offlapping Pliocene-Pleistocene sediment wedges, showing sand-mud transitions and emplacement of salt structures (after Stuart and Caughey, 1977). B. Structural contour map of the diapir adjacent to core E67-113. Contour intervals are 100 feet. (after Lehner, 1969) Point a is the location of figure 11 and point b is the location of figure 12.

facilitate chemical alteration of adjacent sediments that differs from "normal" alteration of deep sea sediments. The core used for this study, core E67-113 (drilled by the Shell Oil Company in 1967), was drilled at longitude 95°54'W and latitude 27°28'N adjacent to a large salt structure (fig. 3b) in the northwestern Gulf on the upper continental slope (fig. 2). The structure has steep flanks and a flat top covered with caprock, which is typical of an extrusive salt plug, and forms a low-relief promontory (Lehner, 1969).

METHODS

Core E67-113 was chosen for this study because of its continuity (88% recovered) compared to other cores available. The coring data and a brief paleontologic report supplied by Shell are in Appendix A. The core is stored in the U. S. Geological Survey Warehouse in Corpus Christi, Texas. Samples were collected as one inch slices at one foot intervals. This was done by personnel at the storage warehouse. The samples were then sent to Moss Landing Marine Laboratories, California. They arrived as chunks of dried clay in individual plastic bags. Sample preparation consisted of weighing each dry sample, dispersing it in a Calgon solution to disaggregate the clay, then wet-sieving each sample with a 38 μm screen. The >38 μm (coarse) fraction was dried and weighed. A final sieving of the dry coarse fraction with a 63 μm sieve was done to separate the 38 - 63 μm fraction for analysis.

Identification of the tephra involved preparing smear slides from the 38 - 63 μm fraction. Using a petrographic microscope, the amount of tephra in each slide was estimated and recorded in one of five categories. These categories are none, trace (<1%), rare (1-4%), common (4-10%), and abundant (>10%). Additional information recorded for each slide included the estimated amount of terrigenous material relative to biogenic material (minus the opaque material) and the amount of opaque material relative to the total sample on the slide (% opaques). The samples that contain >1% ash were put into a 10% HCl solution to dissolve the biogenic material ($CaCO_3$). The end product of this procedure was then put into a mixture of methylene iodide and acetone in a density-gradient column to get a clean ash separate.

Chemical "fingerprinting" of volcanic glass was used as the method of correlating the marine tephra with its terrestrial source. The ash was mounted and analyzed on the electron-microprobe for 9 major elements (Si, Al, Fe, Mg, Mn, Ca, Ti, Na, and K).

Natural glasses and silicate minerals that were analyzed by conventional wet-chemical methods were used as standards. Up to 20 shards were analyzed for each sample. The data were recalculated to 100%, then added to the tephra database at the U. S. Geological Survey in Menlo Park, California. This database contains electron-microprobe data of major element chemistry for tephra from most North American and many Central and Latin American volcanic eruptions. Similarity coefficients were calculated for every sample analyzed with every sample in the tephra database. The similarity coefficient is an average of ratios of element concentrations in two glass samples. The ratios of individual elements are calculated by dividing the concentration in one sample by the concentration in another. The lower concentration is always divided by the higher so the ratio is always less than or equal to one. The coefficients are averaged for all elements in the comparison. The ideal value of this coefficient equals one for an identical pair. Similarity coefficients with values of 0.35 - 0.94 are for different units. Values of 0.94 - 0.96 are intervals of uncertain correlation. Values of 0.96 and higher are considered to be from a single source (Sarna-Wojcicki and others, 1984).

Four different combinations of elements were used for the correlations. These combinations are:

Na_2O, Al_2O_3, SiO_2, CaO, K_2O, Fe_2O_3
Na_2O, Al_2O_3, SiO_2, CaO, K_2O, MgO
Na_2O, Al_2O_3, SiO_2, CaO, K_2O
Na_2O, Al_2O_3, SiO_2, CaO.

An element is useful in the correlation if it is homogeneously distributed within the glass of a single layer, if it differs in concentration in layers of different ages, and if a full range of concentrations can be accurately measured (Sarna-Wojcicki and others, 1984). A list of the best 50 matches was determined for each combination of elements for each sample.

The homogeneity index is calculated for each sample also. This is done by dividing the standard deviation of the counts accepted for each element in each sample by the square

root of the mean. A homogeneity index of 0-2 indicates a very homogeneous sample and suggests that shards are from a single source. Homogeneity indices of 3 or greater indicate increasing heterogeneity (C. E. Meyer, 1990, personal communication).

RESULTS

The opaque material consists of small round beads of pyrite. They appear to be formed by pyritization of organic structures (C. E. Meyer, 1987, personal communication). Appendix B contains the data collected for each sample. Twelve samples contained more than 1% tephra, but no megascopic or discrete tephra layers were found. There was a background level of a few tephra shards in almost every sample. The samples with > 1% tephra came from zones of enriched organic material and > 50% terrigenous material (fig. 4). Samples 1563, 1617, 1629, 1630, 1644, 1653, and 1659 (sample numbers correspond to depth, in feet, below sea level) were not analyzed due to extensive alteration. Samples 1543, 1564, 1640, 1856, and 2178 were less visibly altered and were analyzed. Sample 1640 had the most tephra and is the least altered, so it was analyzed twice, using 15 - 20 grains in each analysis. Two of the samples (1543 and 1564) contained only 3 - 10 acceptable grains.

The chemical data for the five tephra samples analyzed are listed Appendix C and summarized in table 2. The tephra are rhyolitic (75 - 77% SiO_2). The total weight percent of the oxides for all of the samples is low (87 - 91%). This indicates that the tephra have been hydrated. Some of the hydration occurs during the diagenesis of the volcanic glass (Summa and Verosub, 1987).

The best 50 matches (correlations) and chemistry for the samples are in Appendix D. The iron and magnesium of the core samples are significantly different from any other analyses in the database. The iron is very depleted and the magnesium is very enriched. Figure 5 is a comparison of the core sample chemistry with some of the tephra found in the western Gulf. The Faby is represented because of its proximity to the Gulf and possible occurrence within the Gulf (it has not yet been found in the Gulf), and the fact that it appears in some of the correlations for this study. Sample 2040 is from core E67-126A.

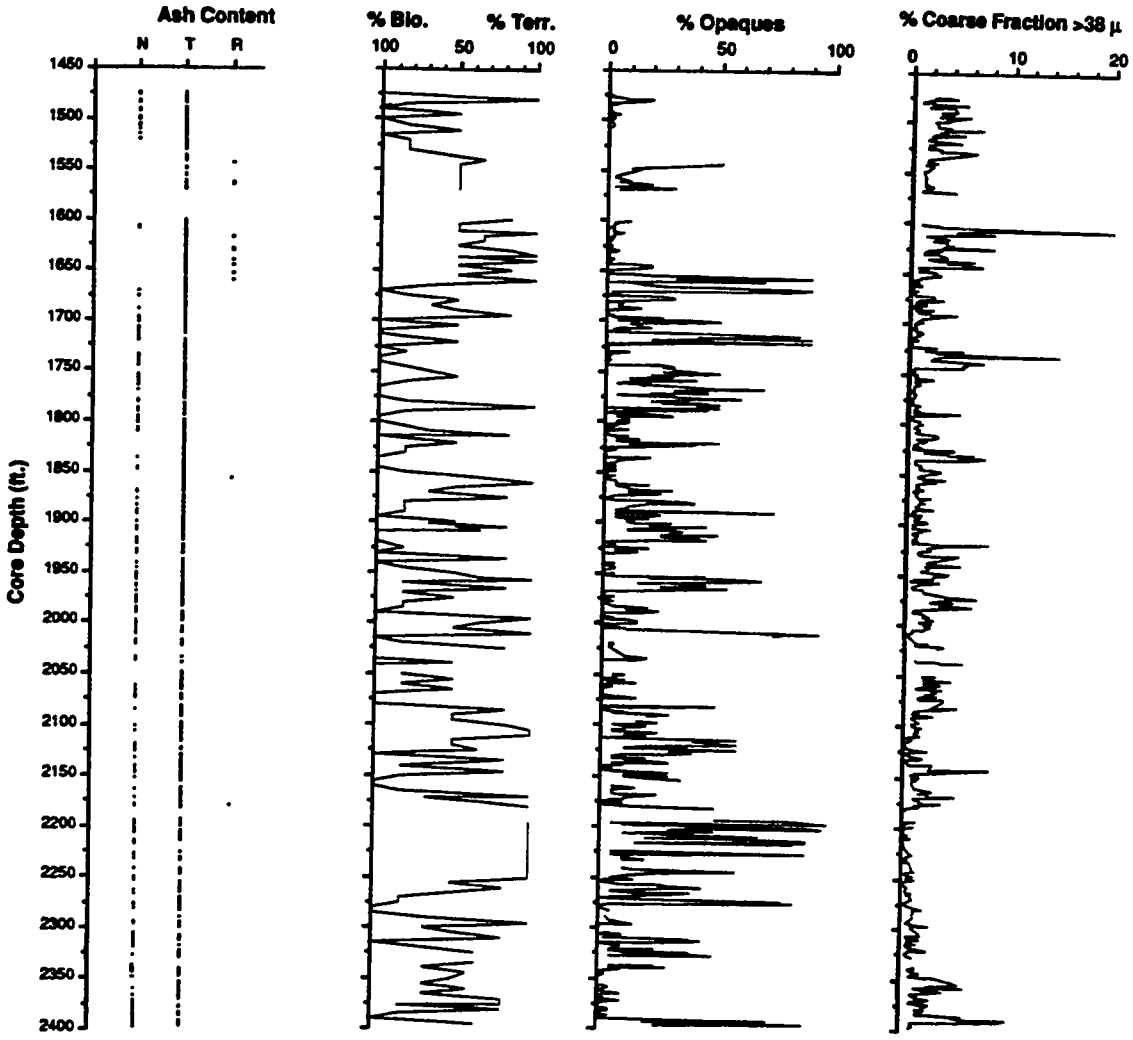

Figure 4. Graph of the data for core E67-113. Ash Content categories: N = 0%, T = < 1%, and R = 1-4%. % Bio - % Terr = amount of biogenic material vs amount of terrigenous material (of total non-opaque material). % Opaques = amount of pyritized organic structures (pyrite beads) compared to the total sample. % Coarse fraction = Weight of >38µ fraction divided by the the total sample.

TABLE 2. CHEMICAL DATA OF TEPHRA AT CORE SITE E67-113.

	Sample No.					
Oxide	1543	1564	1640	1640-2	1856	2178
SiO_2	64.655	66.267	67.225	70.011	69.779	68.775
Al_2O_3	14.915	14.715	14.502	14.474	14.134	14.594
Fe_2O_3*	0.083	0.186	0.207	0.270	0.210	0.405
MgO	0.073	0.626	0.611	0.535	0.445	0.517
MnO	0.008	0.008	0.015	0.006	0.000	0.011
CaO	0.243	0.414	0.407	0.439	0.462	0.384
TiO_2	0.026	0.000	0.000	0.007	0.000	0.000
Na_2O	2.133	1.795	2.464	2.200	2.249	3.245
K_2O	4.028	4.107	3.180	3.204	3.100	2.834
Total	86.825	88.118	88.612	91.146	90.380	90.766
	Recalculated to 100%					
SiO_2	74.47	75.20	75.86	76.81	77.21	75.77
Al_2O_3	17.18	16.70	16.37	15.88	15.64	16.08
Fe_2O_3*	0.10	0.21	0.23	0.30	0.23	0.45
MgO	0.08	0.71	0.69	0.59	0.49	0.57
MnO	0.01	0.01	0.02	0.01	0.00	0.01
CaO	0.28	0.47	0.46	0.48	0.51	0.42
TiO_2	0.03	0.00	0.00	0.01	0.00	0.00
Na_2O	2.46	2.04	2.78	2.41	2.49	3.58
K_2O	4.64	4.66	3.59	3.52	3.43	3.12
Total	99.25	100.00	100.00	100.01	100.00	100.00

Results are in weight %
*Total iron is recalculated as Fe_2O_3.

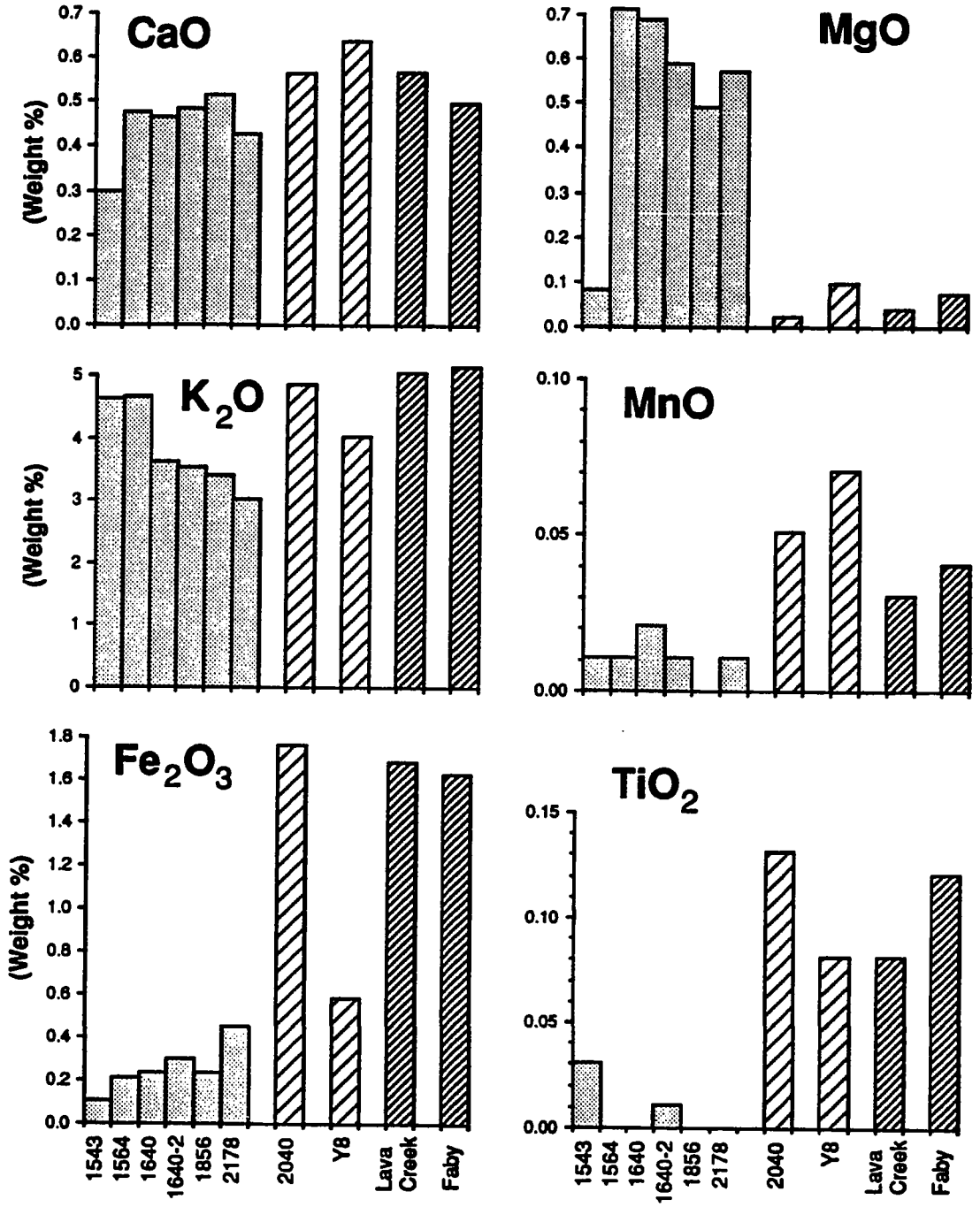

Figure 5. Comparison of chemistry of the samples from core E67-113 with two marine ashes found in the western Gulf of Mexico (2040 and Y8) and two terrestrial ashes (Lava Creek B and Faby).

Y8 and 2040 are marine tephra from the Gulf. The Faby and Los Chocoyos are terrestrial tephra shown here to compare chemical differences between marine and terrestrial tephra. The tephra analyzed throughout core E67-113 are similar to each other, but are very different from the other tephra related to the Gulf (and anywhere else).

Each of the five samples consists of shards that are very heterogeneous. This is indicated by the homogeneity index (Appendix C). Table 3 lists the homogeneity indices for the samples from the core and also samples known to be from single sources for comparison. The majority of indices of the elements from the samples in the core are greater than 3. This provides good evidence that shards in a single sample are differentially altered and possibly from different sources.

The similarity coefficients and lists of 50 best matches for the individual core samples to tephra in the database are in Appendix D. The tephra from the database that appear in the lists of correlations typically represent older, altered tephra that could not stratigraphically occur in the core due to their age (Early Pliocene and older). When Fe_2O_3 or MgO is used in the correlation, the core samples correlate mainly with each other. This is due to the distinct differences between these oxides in the core samples and the tephra in the database. However, a few samples do appear in the correlations that represent Pleistocene tephra found in the western Gulf of Mexico, or that could occur due to the proximity of the source to the western Gulf (fig. 1). These are the Los Chocoyos (Y8 - marine layer) and the Faby Tuff, respectively. Their similarity coefficients are low, typically 70 - 85 %, but appear in the lists in Appendix D as high as the third best match for samples 1564 and 1640.

TABLE 3. COMPARISON OF HOMOGENEITY INDICES OF THE ELEMENTS IN TEPHRA FROM CORE SITE E67-113 TO SOME SINGLE SOURCE SAMPLES

	Samples from Core E67-113					
Oxide	1543	1564	1640	1640-2	1856	2178
SiO_2	10.539	13.584	16.801	7.377	6.708	8.594
Al_2O_3	4.644	3.489	4.622	3.941	3.506	4.338
FeO	1.158	2.901	6.084	9.853	4.751	10.586
MgO	9.918	6.523	8.754	9.951	6.252	9.001
MnO	1.331	1.479	0.872	1.451	0.665	1.116
CaO	3.908	5.408	7.226	9.463	5.612	7.096
TiO_2	1.364	1.047	1.221	2.136	0.819	0.878
Na_2O	3.476	2.558	7.664	8.506	2.443	3.641
K_2O	9.745	8.308	9.799	13.506	10.017	10.380

	Single Source Samples			
Oxide	2040	Faby	Y8	La Primavera
SiO_2	1.348	1.341	1.578	0.979
Al_2O_3	1.930	1.322	1.652	1.145
FeO	2.838	0.804	1.095	1.249
MgO	0.938	0.939	1.053	1.147
MnO	1.083	0.673	0.767	1.100
CaO	2.155	1.450	1.828	1.175
TiO_2	1.853	1.136	1.163	1.166
Na_2O	1.654	2.552	1.920	1.903
K_2O	4.130	0.948	4.069	1.103

Sample 2040 is a marine tephra layer from Core E67-126A from the Gulf of Mexico.
Sample Y8 is a marine tephra from the Gulf of Mexico.
The Faby and La Primavera samples are terrestrial tephra layers from Mexico.

DISCUSSION

Alteration

The tephra in core E67-113 have been highly altered as indicated by the low total weight % of the oxides, enrichment of magnesium, and depletion of the iron, titanium and manganese in each sample. Volcanic glass readily alters due to its thermodynamic instability and poorly ordered internal structure. Low temperature alteration of silica glass typically occurs in two stages. The initial stage consists of hydration and alkali ion exchange. In the second stage, destruction of the glass matrix begins and there is precipitation of secondary phases in the newly created pore spaces (Fisher and Schmincke, 1984).

Subaerial alteration depends on changes in the glass/water system. Leaching of elements from the glass rapidly occurs in a well-flushed fluvial system due to the oxygenated fresh water, which is undersaturated in the elements with respect to the glass. The released ions are then carried downstream. Clay minerals (commonly montmorillonite) are the typical alteration product in these conditions (Fisher and Schmincke, 1984).

Low-temperature marine alteration depends on the same glass/water system as in subaerial conditions. However, the tephra pick up ions (Mg^{2+}, Na^{+}) as well as release them (Ca^{2+})(Brownlow, 1979). The tephra alter to clays (commonly smectites) and zeolites (Summa and others, 1984). Volcanic tephra in the sediment column act as a chemical source and sink. The ions that are released influence the pore water chemistry in the surrounding marine sediments (Fisher and Schmincke, 1984).

The tephra in core E67-113 appear to have been reworked from subaerial deposits and redeposited via fluvial and coastal systems in the Gulf. The homogeneity indices provide some evidence for this. High indices can indicate a number of possible influences

on the tephra. One is that some grains are altered more than others within the sample. Another possibility is that individual grains are heterogeneous initially. They may contain bubbles or lithic intrusions. The third possibility, and typically the most common, is post-depositional reworking. There may be glass incorporated from other eruptions (C. E. Meyer, 1990, personal communication). The tephra in the core occur in zones of increased terrigenous material. This suggests that the tephra were subaerially deposited, then reworked by fluvial and coastal systems to be finally deposited in the Gulf.

Marine alteration has also influenced the tephra in the core as indicated by the enrichment of magnesium and the depletion of iron. The altered tephra probably has picked up extra magnesium from the sea-water. The depletion of iron may be due to the adjacent salt diapir (fig. 3b). The dissolution of near-surface salt increases the salinity of pore fluids and creates anoxic conditions, which preserve marine organic matter and produce a reducing environment (Lehner, 1969; Williams and Lerche, 1987). The tephra samples come from zones enriched in organic material. Pyritization readily occurs in a reducing environment and is seen throughout the core as opaque, pyritized organic structures. Sulfur is associated with the caprock of a salt dome (Krauskopf, 1967); in this case, the caprock is mainly comprised of anhydrite (Lehner, 1969). The reducing environment may have helped the iron to be mobilized from the tephra. This iron, combined with the sulfur, may have contributed to the pyritization. Sample 2178 (the lowermost sample that contains ash in the core) is enriched in magnesium as are the other samples, but it is not significantly depleted in iron. This may be due to the depth at which the sample is located. Compaction at depth, due to overburden of the overlying sediments prior to the ascent of the diapir, could have reduced the pore space. The increase in salinity of the water due to the ascended diapir may not have affected the sediment at this depth because of the inability of the water to enter the pore spaces. The magnesium would be enriched, as in the other

samples in the core, if the tephra has picked up the magnesium from the sea-water in which the sediment was deposited.

Tephrochronology

No correlations can be made with any source of tephra or other marine tephra due to the extensive alteration. It is interesting to note, though, that the Faby, Los Chocoyos, and Y8 ashes do appear in some of the correlations (Appendix D). However, the oxygen isotope stratigraphy ($\partial^{18}O$) for the core indicates that these ashes would not occur in the core (fig. 6). Two major hiatuses occur (D. F. Williams, 1988, written communication), one at 0 - 0.093 Ma (1474 ft below sea level) and one at 0.12 - 1.2 Ma (1728 ft below sea level). The paleontologic report from Shell (Appendix A) indicates a datum line at 1728 ft as a change from Lower Pleistocene to Upper Pleistocene. This datum line correlates with the depth of the lower hiatus that Williams noted in the oxygen isotope stratigraphy. Both of these hiatuses encompass the times that many of the widespread ashes found in the Gulf would occur.

In another core (E67-126A), from the same region as E67-113, where water depth is 1064 ft, a discrete ash layer is found at 2040 ft below sea level. Core E67-126A was drilled on the shelf-slope break (fig. 2). There is less alteration of this ash, and the average homogeneity index is 1-2 (indicating a single source). Electron-microprobe analyses of the ash indicate a correlation with either the Huckleberry Ridge or the Lava Creek B ash (Table 1). Further analysis with X-ray fluorescence, in conjunction with biostratigraphy and oxygen isotope stratigraphy, indicate that the ash layer correlates with the Lava Creek ash (C. L. Ostergren, 1989, personal communication). This ash is not found in core E67-113 because it falls within the 0.12 - 1.2 Ma hiatus.

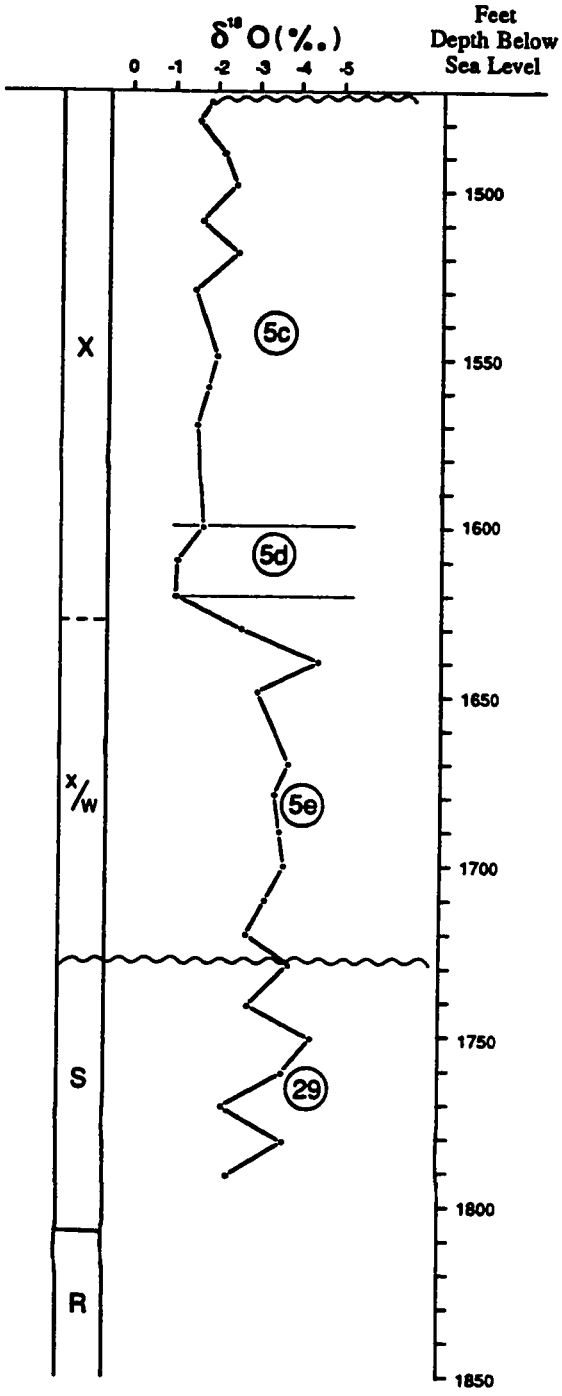

Figure 6. Oxygen isotope stratigraphy for the upper 40% of core E67-113 (From D. F. Williams, 1988, written communication). X, W, S, and R correspond to foraminifera zones and 5c-5e and 29 correspond to oxygen isotopic stages within the foraminifera zones.

Sedimentary History

The proximity of core E67-113 to a large salt diapir is the cause of the major hiatuses indicated by the oxygen isotope stratigraphy. The seismic-reflection profile shows the effect of the adjacent salt diapir on the sediment of the core (fig. 7). Three sections of sediment (A, B, and C) record the history of the rising diapir. Section A shows undisturbed, parallel reflectors, indicating little diapiric activity or activity that had little influence on the sedimentation of the strong reflectors (sedimentation in balance with the ascending diapir). Section B indicates important diapiric activity during deposition. The reflectors pinch out (converge) against the diapir. They show onlap of sediments on a topographic high, or variable compaction due to the rising diapir. Section C consists of parallel reflectors filling a channel. The reflectors at the top of section B are truncated by the channel fill reflectors in section C.

As this diapir ascended, the bottom currents were diverted around this new topographic feature, creating an erosional channel or moat around the diapir in which the core was drilled. As the activity of the diapir slowed, erosion decreased, and eventually deposition increased and the channel that was created was draped with sediment. The upper hiatus of 0 - 93 ka may be due to reactivity of the salt diapir, which may have increased the diverted current activity within the channel and eroded the top 93,000 years of sediment. Figures 8a and 8b are seismic-reflection profiles from the U. S. Geological Survey of the area surrounding the core location. They show a similar channel on the northwestern flank of the diapir, approximately 3,000 meters from the location of the core (points a and b in fig. 3b). This channel is inferred to have been eroded by the same diverted currents.

High rates of sedimentation after the 0.12 - 1.2 Ma hiatus may have caused the renewed activity in the diapir to create the 0 - 93 ka hiatus. Sedimentation rates vary greatly

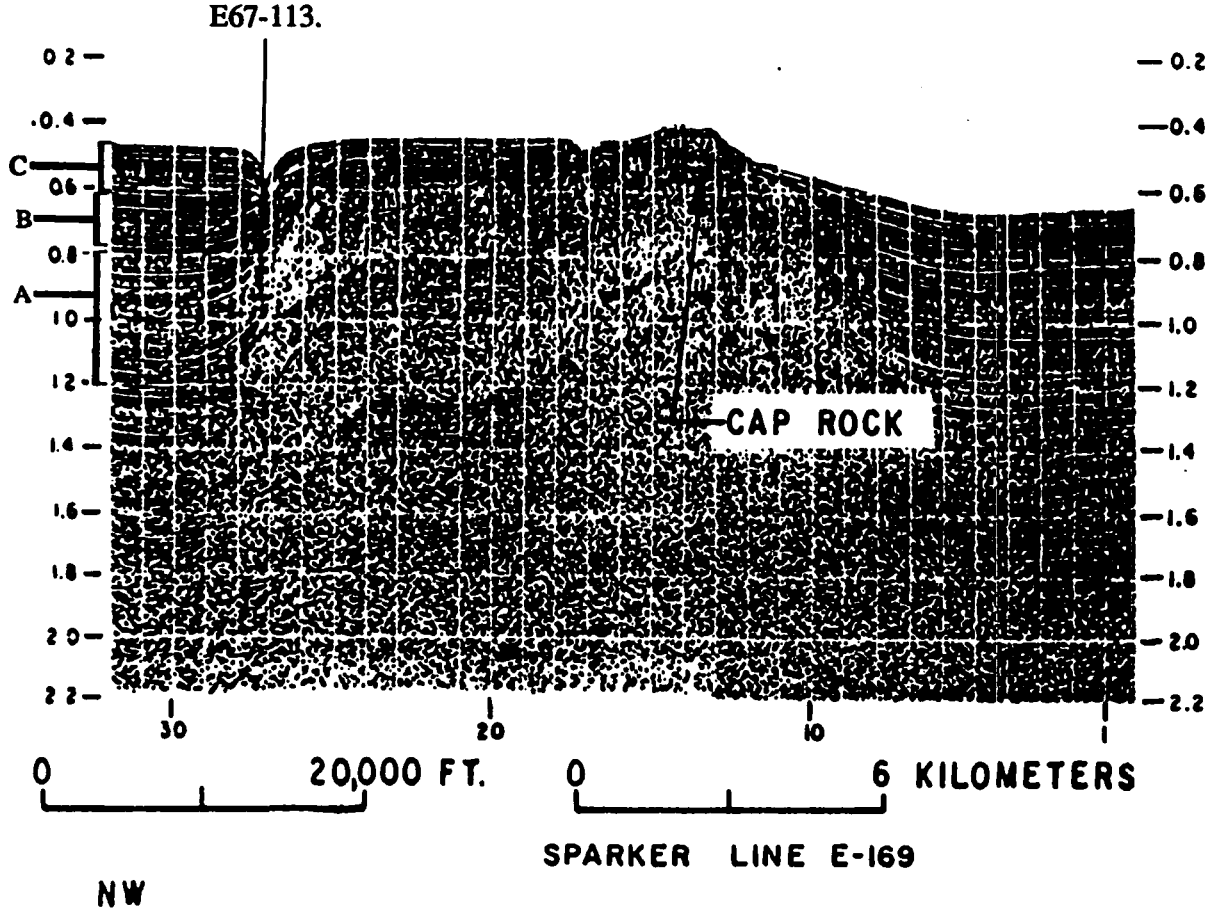

Figure 7. Seismic-reflection profile showing location of core E67-113. (after Lehner, 1969) A = undisturbed parallel reflectors; B = converging reflectors against the diapir; C = parallel channel fill reflectors.

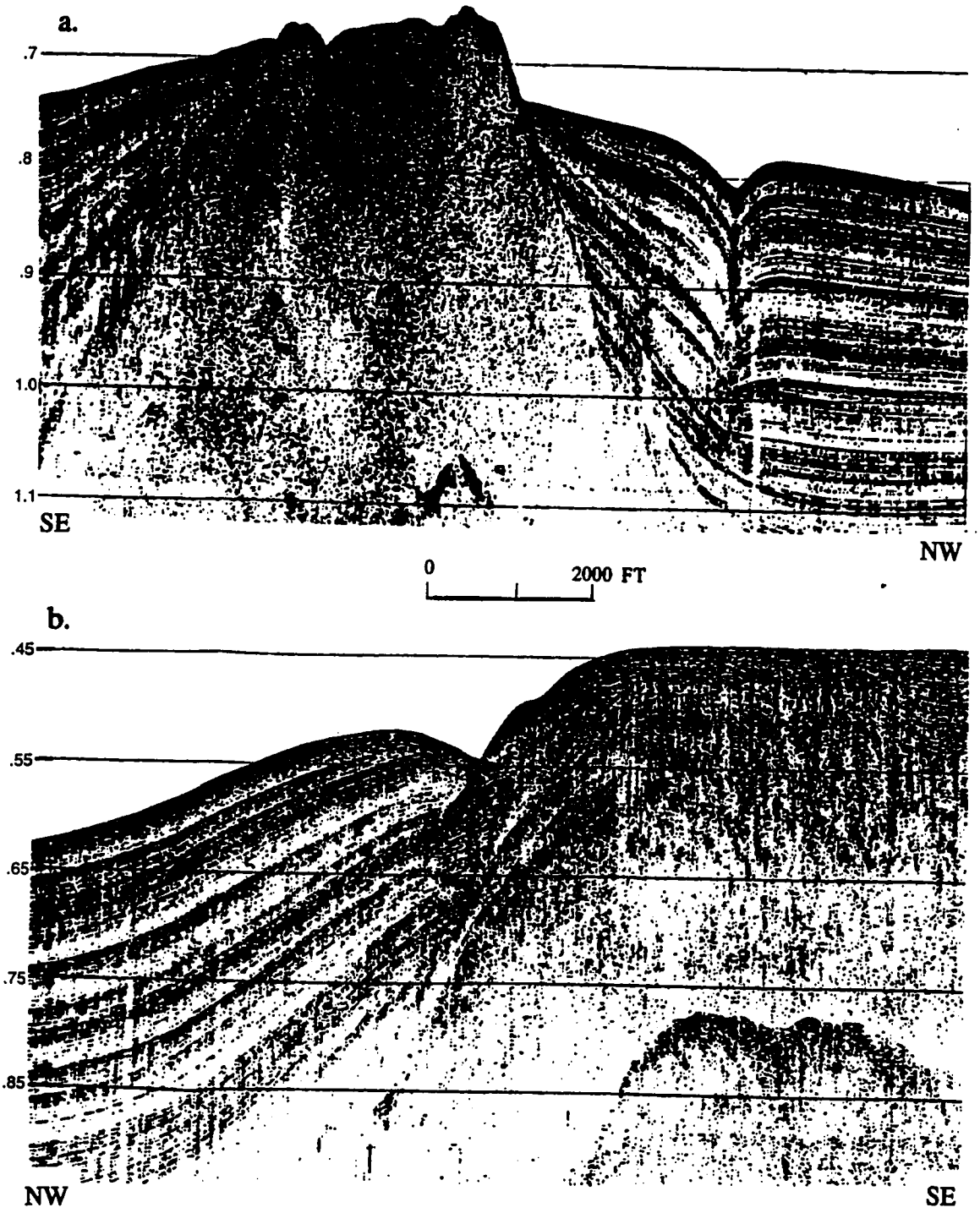

Figure 8. Seismic reflection profiles of the northwestern side of the diapir showing erosional channels similar to the one in which the core was drilled. The top profile (a) corresponds to point a in figure 3 and the bottom profile (b) corresponds to point b in figure 3.

in the Gulf. Thunell (1976) reported rates of 2 - 8 cm/ka, and Kennett and Huddlestun (1972) reported 10 - 30 cm/ka rates and noted that those rates are commonly highly variable within and between cores. The sedimentation rates for core E67-113, based on the oxygen isotope stratigraphy, range from 2.4 cm/ka prior to the hiatus at 0.12 - 1.2 Ma, to 340 cm/ka after the same hiatus, with a section of only 42.2 cm/ka at the 5d isotopic stage (Fig 6). After the erosion stopped, sedimentation rates greatly increased, and large amounts of sediment were deposited prior to renewed activity of the diapir (seen by the second hiatus at 0 - 93 ka). This renewed activity may be due to the rapid accumulation of overburden, causing the less dense salt below to flow upward again.

The depth of the unconformity between sections B and C in the seismic-reflection profile (fig. 7) correlates with the 0.12 - 1.2 Ma hiatus determined by the oxygen isotope stratigraphy (at approximately 1728 ft, fig. 6), and the datum determined by the paleontologic report (at 1728 ft, Appendix A). Seismic velocities recorded for sediments in the Gulf of Mexico range from 1.7 - 1.92 km/sec for the upper kilometer (3281 ft) of sediment on the continental slope (Locker and Chatterjee, 1984). When 1.7 km/sec is used with 0.62 sec for the two-way travel time at the location of the unconformity on the seismic profile, the approximate depth of the unconformity is 527 m (1729 ft).

CONCLUSIONS

The high degree of alteration and hydration of the tephra in core E67-113 (located in the Gulf of Mexico, longitude 95°54'W, latitude 27°28'N) indicate that the tephra have been reworked from land deposits. High homogeneity indices of the electron-microprobe data support the theory of reworked tephra. The tephra occur in zones of comparatively high terrigenous material, indicating that the tephra were redeposited with terrigenous sediment via fluvial and coastal systems. Post-depositional alteration in the marine environment also is indicated by the significant enrichment of magnesium and the depletion of iron in the tephra. Magnesium enrichment may be due to the uptake of magnesium from the sea-water. Iron depletion may be due to the proximity of a salt diapir to the core. The high salinity in the pore fluids in the sediment created an anoxic environment, preserving organic matter and thus forming a reducing environment, ideal for the formation of pyrite, which contains iron from the tephra.

No correlation with any source is possible due to the great amount of alteration. However, poor correlations with a few widespread tephra found in the Gulf are noted. These include the Faby Tuff (0.24 ± 0.03 Ma) and the Los Chocoyos (Y-8) tephra (84 ka). A discrete tephra layer occurs in another core (E67-126A) from the same region and is correlated with the Lava Creek Tuff (0.6 ± 0.02 Ma). Oxygen isotope stratigraphy ($\partial^{18}O$) indicates two major hiatuses occuring at 0 - 0.093 Ma and 0.12 - 1.2 Ma. These time spans include the eruption of the Faby, Los Chocoyos, and Lava Creek tephra. If these tephra are present in the core (indicated by the poor correlations for the Faby and Los Chocoyos), then their stratigraphic position would not be of the time of eruption but of the time the tephra entered the Gulf of Mexico via fluvial and coastal systems.

Seismic reflection profiles show that the core was drilled in a small channel adjacent to a large salt diapir. The reflectors in the profile indicate changes in the sedimentation due

to changes in the activity of the rising diapir. The unconformities may be related to times of increased activity of the diapir. As the diapir rose, currents were diverted around the new topographic high and eroded sediments to form a channel. An unconformity is indicated in the reflection data and approximately correlates with the timing of the large hiatus from 0.12 - 1.2 Ma. High sedimentation rates based on the oxygen isotope stratigraphy after the 0.12 - 1.2 Ma hiatus may have caused the renewed activity of the diapir to create the 0 - 0.093 Ma hiatus at the top of the core.

REFERENCES CITED

Bowles, F. A., Jack, R. N., and Carmichael, I. S. E., 1973, Investigation of deep-sea volcanic ash layers from equatorial Pacific cores: Geological Society of America Bulletin, v. 84, p. 2371-2388.

Brownlow, A. H., 1979, Geochemistry: New Jersey, Prentice-Hall, Inc., 498 p.

Brunner, C. A., 1984, Evidence for increased volume transport of the Florida current in the Pliocene and Pleistocene: Marine Geology, v. 54, p. 223-235.

Brunner, C. A., and Cooley, J. F., 1976, Circulation in the Gulf of Mexico during the last glacial maximum 18,000 years ago: Geological Society of America Bulletin, v. 87, p. 681-686.

Davies, D. K., 1972, Deep-sea sediments and their sedimentation, Gulf of Mexico: American Association of Petroleum Geologists Bulletin, v. 56, p. 2212-2239.

Drexler, J. W., Rose, W. I., Jr., Sparks, R. S. J., and Ledbetter, M. T., 1980, Los Chocoyos ash, Guatemala: A major stratigraphic marker in Middle America and in three ocean basins: Quaternary Research, v. 13, p. 327-345.

Ericson, D. B., and Wollin, G., 1968, Pleistocene climates and chronology in deep-sea sediments: Science, v. 162, p. 1227-1234.

Ferriz, H. and Mahood, G. A., 1984, Eruption rates and compositional trends at Los Humeros Volcanic Center, Puebla, Mexico: Journal of Geophysical Research, v. 89, p. 8511-8524.

Fisher, R. V. and Schmincke, H.-U., 1984, Pyroclastic rocks: New York, Springer - Verlag, 472 p.

Hodell, D. A., Williams, D. F., and Kennett, J. P., 1985, Late Pleistocene reorganization of deep vertical water-mass structure in the western South Atlantic: faunal and isotopic evidence: Geological Society of America Bulletin, v. 96, p. 495-503.

Izett, G. A., 1981, Volcanic ash beds: recorders of Upper Cenozoic silicic pyroclastic volcanism in the western United States: Journal of Geophysical Research, v. 86, p. 10200-10222.

Jendrzcejewski, J. P. and Hart, G. E., 1978, Distribution of siliceous microfossils in surficial bottom sediments of the Gulf of Mexico: Palynology, v. 2, p. 159-166.

Kennett, J. P., 1981, Marine tephrochronology, *in* Emiliani, C., ed., The oceanic lithosphere. The sea: New York, Wiley-Interscience Publishers, p. 1373-1436.

Kennett, J. P. and Huddlestun, P., 1972, Late Pleistocene paleoclimatology, foraminiferal biostratigraphy and tephrochronology, western Gulf of Mexico: Quaternary Research, v. 2, p. 38-69.

Krauskopf, K. B., 1967, Introduction to geochemistry: New York, McGraw-Hill, Inc., 721 p.

Ledbetter, M. T., 1984, Late Pleistocene tephrochronology, *in* Healy-Williams, N., ed., Principles of Pleistocene stratigraphy applied to the Gulf of Mexico: International Human Resources Development Corporation, p. 119-148.

Ledbetter, M. T., 1985, Tephrochronology of marine tephra adjacent to Central America: Geological Society of America Bulletin, v. 96, p. 77-82.

Lehner, P., 1969, Salt tectonics and Pleistocene stratigraphy on continental slope of northern Gulf of Mexico: American Association of Petroleum Geologists Bulletin, v. 53, p. 2431-2479.

Leipper, D. F., 1970, A sequence of current patterns in the Gulf of Mexico: Journal of Geophysical Research, v. 75, p. 637-657.

Locker, S. D. and Chatterjee, S. K., 1984, Seismic velocity structure, *in* Buffler, R. T., Locker, S. D., Bryant, W. R., Hall, S. A., and Pilger, R. H., Jr., eds., Ocean Margin Drilling Program, Regional Data Synthesis Series, Atlas 6, Gulf of Mexico: Marine Science International, Woods Hole, p. 4.

Mahood, G. A., 1980, Geological evolution of a Pleistocene rhyolitic center - Sierra La Primavera, Jalisco, Mexico: Journal of Volcanology and Geothermal Research, v. 8, p. 199-230.

Rabek, K., Ledbetter, M. T., and Williams, D. F., 1985, Tephrochronology of the western Gulf of Mexico for the last 185,000 years: Quaternary Research, v. 23, p. 403-416.

Rose, W. I., Hahn, G. A., Drexler, J. W., Malinconico, M. L., Peterson, P. S., and Wunderman, R. L., 1981, Quaternary tephra of northern Central America, *in* Self, S. and Sparks, R. S. J., eds., Tephra studies: Holland, D. Reidel Publishers Co., p. 193-211.

Sarna-Wojcicki, A. M., Bowman, H. R., Meyer, C. E., Russell, P. C., Woodward, M. J., McCoy, G., Rowe, J. J., Jr., Baedecker, P. A., Asaro, F., and Michael, H., 1984, Chemical analyses, correlations, and ages of Upper Pliocene and Pleistocene ash layers of east-central and southern California: U. S. Geological Survey Professional Paper 1293, 41 p.

Stuart C. J. and Caughey, C. A., 1977, Seismic facies and sedimentology of terrigenous Pleistocene deposits in northwest and central Gulf of Mexico, *in* Payton, C. E., ed., Seismic stratigraphy - applications to hydrocarbon exploration: American Association of Petroleum Geologists Memoir 26, p. 249-275.

Summa, L. L., Guichard, F., and Verosub, K. L., 1984, Trace element mobility in tephra from three diagenetic environments [abs]: Geological Society of America, Annual Meeting, Abstracts with Programs, v. 16, p. 670.

Summa, L. L., and Verosub, K. L., 1987, A catalog of North American ashes found in altered and unaltered states for use as a data base in studying tephra diagenesis: Journal of Volcanology and Geothermal Research, v. 32, p. 321-327.

Thunell, R. C., 1976, Calcium carbonate dissolution history in Late Quaternary deep-sea sediments, western Gulf of Mexico: Quaternary Research, v. 6, p. 281-297.

Wilhelm, O. and Ewing, M., 1972, Geology and history of the Gulf of Mexico: Geological Society of America Bulletin, v. 83, p. 575-600.

Williams, D. F. and Lerche, I., 1987, Salt domes, organic-rich source beds and reservoirs in intraslope basins of the Gulf Coast region, *in* Lerche, I., and O'Brien, J. J., eds., Dynamical geology of salt and related structures: Orlando, Florida, Academic Press, Inc., p. 751-786.

APPENDIX A

Paleontologic report and coring data for core E67-113 provided by Shell Oil Co.

PALEONTOLOGIC REPORT

E67-113 (USGS-113)

WATER DEPTH - 1472'

First sample - 1472'	Recent-Upper Pleistocene mixed
Sample - 1728'	Lower Pleistocene
Last sample - 2391'	In Lower Pleistocene
TD - 2400'	Lower Pleistocene

M/V EUREKA CORING DATA

Sheet 1 of 5

Hole No. E 67-113

Drillers Water Depth 1472

Drillers Total Depth 2400

On Location 1530 7/17/67
Going in hole 1545 - APE trouble
Completed Hole 0250 7/19/67

Date 7/17-18/67

Coordinates 27°28' 95°54'

Raydist Loc.

Total Footage Cored 928'

Total Footage Recovered 815'
No Log run
S.P. 928'

CORE NO.	CORED INTERVAL	RECOVERY IN FEET	REMARKS
1	1472-88	13/16'	Clay, soft, grn-gy, forams
2	1488-1504	15/16'	a.l.a.
3	1504-20	14/16'	Clay - becoming firmer - grn-gy - forams
4	1520-36	12/16'	Clay - soft - grn-gy - forams
5	1536-52	14/16'	Clay - mod firm - grn-gy - forams
6	1552-68	17/16'	a.l.a.
7	1568-84	16/16'	a.l.a. sli sdy at 1583
8	1584-1600	15/16'	Clay, brn-gy to med-gy interbedded, firmer
9	1600-16	16/16'	a.l.a., few forams
10	1616-32	17/16'	Clay, grn-gy, with white sand zones, firm, forams
11	1632-48	16/16'	a.l.a. but bec darker colored, little sand
12	1648-64	14/16'	a.l.a., but no sand
13	1664-80	17/16'	a.l.a.
14	1680-96	18/16'	a.l.a.

M/V EUREKA CORING DATA

Sheet 2 of 5

Hole No. E 67-113 Date 7/18/67

Drillers Water Depth 1472 Coordinates

Drillers Total Depth Raydist Loc.

On Location Total Footage Cored

Completed Hole Total Footage Recovered

CORE NO.	CORED INTERVAL	RECOVERY IN FEET	REMARKS
15	1696-1712	15/16'	bottom 2-1/2' blew out of core bbl a.l.a. and landed on oily deck
16	1712-28	16/16'	As above, core #12, faint red cast 1714'-22'
17	1728-44	17/16'	As above, no red. Bottom 3 ft blew out on deck possible contamination
18	1744-60	17/16'	Clay, dark grn-gy, some color variation in shade
19	1760-76	17/16'	a.l.a.
20	1776-92	15/16'	Bottom 3 ft blew out of bbl - possible a.l.a. contamination
21	1792-1808	16/16'	a.l.a. Some forams and shell material
22	1808-24	16/16'	a.l.a.
23	1824-40	16/16'	a.l.a.
24	1840-56	17/16'	a.l.a.
25	1856-72	16/16'	a.l.a.
26	1872-88	17/16'	a.l.a.
27	1888-1904	16/16'	a.l.a. rare sdy laminae
28	1904-20	16/16'	a.l.a., silty-sandy at bottom 6'

M/V EUREKA CORING DATA

Sheet 3 of 5

Hole No. E 67-113 Date 7/18/67

Drillers Water Depth 1472 Coordinates

Drillers Total Depth Raydist Loc.

On Location Total Footage Cored

Completed Hole Total Footage Recovered

CORE NO.	CORED INTERVAL	RECOVERY IN FEET	REMARKS
29	1920-36	11/16'	a.l.a. little silt
30	1936-52	16/16'	a.l.a., few silt to sand laminae
31	1952-68	16/16'	As above core #18, some sandy zones
32	1968-84	16/16'	a.l.a.
33	1984-2000	15/16'	Clay, dark brn-gy, & dk grn-gy, bedded & mottled in part, firm, forams, rare silty lams
34	2000-16	12/16'	a.l.a., lower 6' very dark, gritty zones-forams?Sd?
35	2016-32	6/16'	a.l.a. but bec lighter gy again
36	2032-48	6/16'	a.l.a. grn-gy, rich forams, clay very dry
37	2048-64	16/16'	a.l.a.
38	2064-80	11/16'	a.l.a., clam shell @ 2075-2076
39	2080-2096	12/16'	a.l.a.
40	2096-2112	14/16'	a.l.a.
41	2112-28	14/16'	Clay, interbedded brn-gy & grn-gy, sandy laminae firm.
42	2128-44	16/16'	a.l.a.

M/V EUREKA CORING DATA

Sheet 4 of 5

Hole No. E 67-113 Date 7/18-19/67

Drillers Water Depth _____ Coordinates _____

Drillers Total Depth _____ Raydist Loc. _____

On Location _____ Total Footage Cored _____

Completed Hole _____ Total Footage Recovered _____

CORE NO.	CORED INTERVAL	RECOVERY IN FEET	REMARKS
43	2144-60	12/16'	a.l.a.
44	2160-76	16/16'	a.l.a. and apparent 30°+ fracture? or dip?
45	2176-92	6/16'	a.l.a. bec more grn in bottom 6" - sharp contact
46	2192-2208	9/12'	Clay as above core #41
47	2208-24	10/16'	a.l.a.
48	2224-40	10/16'	a.l.a.
49	2240-56	15/16'	a.l.a.
50	2256-72	11/16'	a.l.a.
51	2272-88	12/16'	a.l.a. but slightly lighter shades of color
52	2288-2304	10/16'	Same as #51
53	2304-20	15/16'	same as core #41 darker again, very firm
54	2320-36	9/16'	a.l.a., well laminated zones
55	2336-52	13/16'	a.l.a.
56	2352-68	15/16'	a.l.a. with well defined thin beds.

M/V EUREKA CORING DATA

Sheet 5 of 5

Hole No. E 67-113 Date 7/18-19/67

Drillers Water Depth _____ Coordinates _____

Drillers Total Depth _____ Raydist Loc. _____

On Location _____ Total Footage Cored _____

Completed Hole _____ Total Footage Recovered _____

CORE NO.	CORED INTERVAL	RECOVERY IN FEET	REMARKS
57	2368-84	15/16'	a.l.a. some laminae, some massive
58	2384-2400	12/16'	no silt a.l.a. to 2390.5 then massive dk-grn-gy, or sand
Winds 40 knots - seas 8-12'			Had to abandon hole before losing string

APPENDIX B

The appendix contains the observational data for core E67-113. Sample numbers correspond to number of feet below sea level. Water depth at the coring site is 1472 ft. The first two samples were lost (1472 and 1473). Samples in bold print are those with more than 1% ash.

Categories for amount of ash are:
None = 0%
Trace = < 1%
Rare = 1-4%

No sample contained more than 4% ash.

The biogenic to terrigenous category is a semi-quantitative comparison of the non-opaque material in each sample. To graph these data, the following conversion was made:

f >>>> t	100% biogenic material
f = t	50% biogenic and 50% terrigenous
f <<<< t	100% terrigenous

The amount of opaque material is relative to the entire sample.

Sample Data for Core E67-113

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1474	15.35	0.31	2.02	trace	f >>> t	1
1475	16.13	0.54	3.35	none	f >>> t	1
1476	26.34	1.15	4.37	none	f >>> t	2
1477	43.64	1.02	2.34	trace	f >>> t	1
1478	-	-	-	-	-	-
1479	21.07	0.17	0.81	trace	f <<< t	10
1480	15.05	0.27	1.79	trace	f >> t	20
1481	25.10	0.58	2.31	trace	f >> t	15
1482	30.08	1.60	5.32	trace	f >>> t	1
1483	23.25	0.48	2.06	none	f >>> t	5
1484	34.18	0.54	1.58	trace	f >> t	3
1485	26.78	1.06	3.96	none	f >> t	<1
1486	-	-	-	-	-	-
1487	-	-	-	-	-	-
1488	-	-	-	-	-	-
1489	47.37	2.02	4.26	trace	f >>> t	1
1490	29.00	0.81	2.79	trace	f >>> t	<1
1491	29.18	1.17	4.01	none	f >> t	1
1492	25.42	0.92	3.62	none	f >> t	2
1493	23.67	0.69	2.92	trace	f >>> t	1
1494	30.04	0.77	2.56	trace	f < t	5
1495	19.13	1.07	5.59	trace	f > t	1
1496	-	-	-	-	-	-
1497	38.45	1.20	3.12	trace	f > t	3
1498	22.04	0.81	3.68	trace	f >> t	1
1499	14.24	0.47	3.30	none	f >>> t	<1
1500	27.94	0.62	2.22	none	f >> t	2
1501	31.08	0.76	2.45	trace	f >> t	1
1502	-	-	-	-	-	-
1503	-	-	-	-	-	-
1504	19.75	0.47	2.38	trace	f > t	2

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1505	-	-	-	-	-	-
1506	21.76	0.84	3.86	none	f >> t	2
1507	30.27	0.96	3.17	none	f >> t	1
1508	18.33	1.27	6.93	trace	f > t	not recorded
1509	16.06	0.44	2.74	trace	f > t	not recorded
1510	22.61	0.62	2.74	none	f = t	not recorded
1511	27.24	0.91	3.34	trace	f >> t	not recorded
1512	15.35	0.32	2.08	trace	f >> t	not recorded
1513	30.41	1.52	5.00	trace	f >> t	not recorded
1514	52.22	1.00	1.91	trace	f >> t	not recorded
1515	17.60	0.39	2.22	none	f >>> t	not recorded
1516	14.07	0.29	2.06	trace	f >> t	not recorded
1517	28.79	0.40	1.39	trace	f >> t	not recorded
1518	-	-	-	-	-	-
1519	-	-	-	-	-	-
1520	19.85	0.93	4.69	trace	f >> t	not recorded
1521	18.80	0.48	2.55	none	f >> t	not recorded
1522	23.00	0.37	1.61	trace	f >> t	not recorded
1523	31.54	0.70	2.22	trace	f >>> t	not recorded
1524	32.27	0.55	1.70	trace	f >> t	not recorded
1525	19.12	0.28	1.46	trace	f >> t	not recorded
1526	39.24	0.86	2.19	trace	f >> t	not recorded
1527	41.12	1.16	2.82	trace	f > t	not recorded
1528	29.15	0.79	2.71	trace - rare	f >> t	not recorded
1529	41.59	1.66	3.99	trace	f >> t	not recorded
1530	23.26	1.46	6.28	trace	f >> t	not recorded
1531	-	-	-	-	-	-
1532	-	-	-	-	-	-
1533	-	-	-	-	-	-
1534	-	-	-	-	-	-
1535	-	-	-	-	-	-
1536	-	-	-	-	-	-
1537	24.25	0.39	1.61	trace	f >> t	not recorded

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1538	18.22	0.26	1.43	trace	f > t	not recorded
1539	28.52	0.46	1.61	trace	f = t	not recorded
1540	42.71	0.86	2.01	trace	f > t	not recorded
1541	31.46	0.77	2.45	trace	f = t	not recorded
1542	31.11	0.42	1.35	trace	f = t	50
1543	24.58	0.49	1.99	rare	f < t	50
1544	-	-	-	-	-	-
1545	-	-	-	-	-	-
1546	-	-	-	-	-	-
1547	-	-	-	-	-	-
1548	31.54	0.47	1.49	trace	f > t	10
1549	40.56	0.45	1.11	trace	f = t	15
1550	-	-	-	-	-	-
1551	-	-	-	-	-	-
1552	-	-	-	-	-	-
1553	-	-	-	-	-	-
1554	-	-	-	-	-	-
1555	55.46	0.70	1.26	trace	f > t	5
1556	28.87	0.38	1.32	trace	f > t	3
1557	-	-	-	-	-	-
1558	-	-	-	-	-	-
1559	-	-	-	-	-	-
1560	-	-	-	-	-	-
1561	15.49	0.21	1.36	trace	f = t	10
1562	27.48	0.42	1.53	trace	f >> t	5
1563	28.97	0.39	1.35	rare	f = t	10
1564	40.58	0.84	2.07	rare	f < t	15
1565	12.62	0.26	2.06	trace - rare	f = t	20
1566	-	-	-	-	-	-
1567	21.70	0.34	1.57	trace	f > t	3
1568	25.65	0.25	0.97	trace	f < t	30
1569	26.73	1.14	4.26	trace	f = t	5
1570	-	-	-	-	-	-

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1571	-	-	-	-	-	-
1572	-	-	-	-	-	-
1573	-	-	-	-	-	-
1574	-	-	-	-	-	-
1575	-	-	-	-	-	-
1576	-	-	-	-	-	-
1577	-	-	-	-	-	-
1578	-	-	-	-	-	-
1579	-	-	-	-	-	-
1580	-	-	-	-	-	-
1581	-	-	-	-	-	-
1582	-	-	-	-	-	-
1583	-	-	-	-	-	-
1584	-	-	-	-	-	-
1585	-	-	-	-	-	-
1586	-	-	-	-	-	-
1587	-	-	-	-	-	-
1588	-	-	-	-	-	-
1589	-	-	-	-	-	-
1590	-	-	-	-	-	-
1591	-	-	-	-	-	-
1592	-	-	-	-	-	-
1593	-	-	-	-	-	-
1594	-	-	-	-	-	-
1595	-	-	-	-	-	-
1596	-	-	-	-	-	-
1597	-	-	-	-	-	-
1598	-	-	-	-	-	-
1599	-	-	-	-	-	-
1600	-	-	-	-	-	-
1601	39.97	0.39	0.98	trace	f << t	10
1602	22.84	0.43	1.88	trace	f < t	3
1603	18.48	0.45	2.44	trace	f << t	5

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1604	-	-	-	-	-	-
1605	24.52	0.77	3.14	trace	f = t	3
1606	18.57	2.09	11.25	trace	f < t	3
1607	13.10	2.60	19.85	none	f > t	1
1608	21.98	1.49	6.78	trace	f < t	3
1609	21.30	0.96	4.51	none	f > t	3
1610	18.28	1.01	5.53	trace	f = t	3
1611	20.02	1.63	8.14	trace	f = t	2
1612	45.74	0.80	1.75	trace	f > t	5
1613	17.20	0.25	1.45	trace	f << t	7
1614	26.49	0.73	2.76	trace	f < t	3
1615	23.12	0.78	3.37	trace	f < t	2
1616	18.84	0.71	3.77	trace	f < t	3
1617	26.87	0.57	2.12	rare	f << t	3
1618	12.93	0.34	2.63	trace	f <<< t	1
1619	37.29	1.36	3.65	trace	f << t	2
1620	-	-	-	-	-	-
1621	-	-	-	-	-	-
1622	25.38	0.87	3.43	trace	f < t	1
1623	34.60	1.43	4.13	trace	f < t	1
1624	22.48	0.70	3.11	trace	f = t	1
1625	23.58	1.93	8.18	trace	f < t	2
1626	22.47	0.69	3.07	trace	f = t	1
1627	18.32	0.30	1.64	trace	f << t	1
1628	22.14	0.67	3.03	trace	f << t	1
1629	40.28	0.52	1.29	rare	f << t	2
1630	24.20	0.31	1.28	rare	f < t	5
1631	16.71	0.44	2.63	trace	f < t	5
1632	19.99	0.58	2.90	trace	f <<< t	1
1633	-	-	-	-	-	-
1634	20.27	0.69	3.40	trace	f > t	1
1635	15.45	0.56	3.62	trace	f = t	1
1636	24.06	0.40	1.66	trace	f << t	1

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1637	36.42	0.96	2.64	trace	f > t	1
1638	20.23	1.10	5.44	trace	f > t	3
1639	33.94	2.12	6.25	trace	f > t	2
1640	23.78	0.87	3.66	rare	f <<< t	2
1641	33.03	1.62	4.90	trace	f <<< t	1
1642	15.10	0.87	5.76	trace	f <<< t	1
1643	24.14	1.71	7.08	trace	f <<< t	1
1644	37.32	0.25	0.67	rare	f << t	10
1645	23.38	0.38	1.63	trace	f > t	20
1646	23.33	0.40	1.71	trace	f < t	15
1647	13.25	0.11	0.83	trace	f = t	20
1648	31.74	0.79	2.49	trace	f << t	10
1649	-	-	-	-	-	-
1650	23.27	0.59	2.54	trace	f << t	1
1651	24.72	0.53	2.14	trace	f << t	1
1652	18.86	0.57	3.02	trace	f <<< t	2
1653	16.09	0.24	1.49	rare	f << t	1
1654	25.50	0.25	0.98	trace	f < t	10
1655	22.37	0.22	0.98	trace	f < t	20
1656	-	-	-	-	-	-
1657	18.71	0.06	0.32	trace	f = t	90
1658	29.72	0.10	0.34	trace	f << t	60
1659	17.49	0.14	0.80	rare	f = t	30
1660	24.70	0.14	0.57	trace	f < t	70
1661	25.53	0.28	1.10	trace	f <<< t	1
1662	27.90	0.12	0.43	trace	f < t	10
1663	-	-	-	-	-	-
1664	-	-	-	-	-	-
1665	27.04	0.04	0.15	trace	f > t	20
1666	35.96	0.10	0.28	trace	f >> t	30
1667	18.73	0.13	0.69	trace	f >>> t	50
1668	-	-	-	-	-	-
1669	35.09	0.07	0.20	trace	f = t	90

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1670	16.56	0.08	0.48	trace	f > t	80
1671	33.74	0.21	0.62	none	f >>> t	2
1672	21.60	0.15	0.69	trace	f >>> t	5
1673	47.96	1.17	2.44	trace	f >> t	3
1674	14.63	0.34	2.32	trace	f >> t	1
1675	19.05	0.18	0.94	trace	f >> t	3
1676	29.87	0.26	0.87	none	f >> t	25
1677	22.54	0.73	3.24	trace	f >> t	25
1678	31.94	0.19	0.59	trace	f >> t	30
1679	9.87	0.06	0.61	trace	f >>> t	15
1680	25.73	0.40	1.55	trace	f >>> t	15
1681	29.02	0.47	1.62	trace	f > t	1
1682	19.58	0.07	0.36	trace	f >> t	5
1683	28.45	0.08	0.28	trace	f >> t	7
1684	13.68	0.15	1.10	trace	f > t	5
1685	17.10	0.09	0.53	trace	f > t	5
1686	15.57	0.08	0.51	trace	f >> t	5
1687	22.18	0.51	2.30	trace	f = t	5
1688	17.01	0.14	0.82	trace	f >> t	15
1689	19.59	0.30	1.53	none	f < t	2
1690	16.16	0.32	1.98	trace	f < t	<1
1691	24.97	0.52	2.08	trace	f < t	1
1692	14.84	0.69	4.65	trace	f << t	<1
1693	21.63	0.60	2.77	trace	f > t	1
1694	26.40	0.42	1.59	trace	f > t	1
1695	8.06	0.10	1.24	trace	f > t	3
1696	24.42	0.23	0.94	trace	f >> t	2
1697	34.73	0.25	0.72	none	f >> t	25
1698	12.27	0.16	1.30	trace	f = t	5
1699	8.77	0.04	0.46	none	f > t	5
1700	24.21	0.20	0.83	none	f >> t	35
1701	13.30	0.05	0.38	trace	f >>> t	50
1702	19.99	0.09	0.45	none	f > t	15

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1703	25.16	0.11	0.44	trace	f > t	10
1704	22.95	0.15	0.65	trace	f >>> t	15
1705	26.29	0.08	0.30	trace	f >>> t	15
1706	13.14	0.07	0.53	none	f >>> t	15
1707	17.24	0.13	0.75	none	f >>> t	20
1708	12.38	0.14	1.13	none	f >>> t	5
1709	27.15	0.35	1.29	trace	f >> t	3
1710	22.83	0.17	0.74	trace	f >>> t	10
1711	15.88	0.15	0.94	none	f >>> t	1
1712	-	-	-	-	-	-
1713	-	-	-	-	-	-
1714	34.82	0.03	0.09	trace	f >> t	85
1715	25.87	0.00	0.02	none	f >> t	50
1716	17.35	0.14	0.81	none	f >> t	40
1717	18.20	0.02	0.11	none	f >> t	90
1718	21.14	0.01	0.05	none	f >> t	45
1719	23.12	0.03	0.13	none	f >> t	20
1720	35.87	0.09	0.25	trace	f > t	75
1721	22.92	0.06	0.26	trace	f = t	90
1722	21.17	0.00	0.02	trace	f = t	<1
1723	42.32	0.03	0.07	trace	f >> t	25
1724	27.44	0.75	2.73	trace	f >>> t	<1
1725	-	-	-	-	-	-
1726	28.38	0.43	1.52	trace	f >>> t	1
1727	35.36	0.89	2.52	trace	f >> t	1
1728	29.70	1.57	5.29	trace	f >>> t	<1
1729	33.94	0.92	2.71	trace	f > t	1
1730	26.58	1.91	7.19	trace	f >> t	<1
1731	27.47	1.90	6.92	trace	f > t	10
1732	15.30	2.24	14.64	trace	f >> t	2
1733	21.60	0.70	3.24	trace	f >> t	1
1734	22.65	0.54	2.38	trace	f >>> t	2
1735	36.75	1.08	2.94	none	f >>> t	1

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1736	37.35	0.79	2.12	none	f >>> t	1
1737	30.49	1.55	5.08	none	f >>> t	<1
1738	22.81	1.68	7.37	trace	f >>> t	2
1739	9.63	0.54	5.61	none	f >>> t	<1
1740	29.47	1.58	5.36	trace	f >> t	1
1741	29.38	1.70	5.79	none	f >>> t	1
1742	19.41	1.01	5.20	trace	f >>> t	<1
1743	23.79	1.27	5.34	trace	f >>> t	<1
1744	26.43	0.17	0.64	trace	f >> t	25
1745	20.28	0.09	0.44	none	f >> t	30
1746	23.99	0.06	0.25	trace	f >>> t	25
1747	40.01	0.22	0.55	trace	f >> t	30
1748	-	-	-	-	-	-
1749	18.99	0.06	0.32	trace	f >> t	30
1750	24.79	0.22	0.89	trace	f > t	40
1751	37.75	0.17	0.45	trace	f >> t	25
1752	13.37	0.11	0.82	trace	f > t	50
1753	25.14	0.18	0.72	trace	f > t	20
1754	21.10	0.13	0.62	none	f >> t	20
1755	-	-	-	-	-	-
1756	39.15	0.96	2.45	trace	f = t	30
1757	28.12	0.16	0.57	none	f > t	10
1758	12.68	0.09	0.71	none	f > t	30
1759	33.86	0.34	1.00	trace	f > t	40
1760	35.62	0.42	1.18	trace	f >> t	10
1761	38.39	0.21	0.55	none	f >> t	5
1762	22.86	0.12	0.52	trace	f >>> t	20
1763	37.87	0.14	0.37	trace	f >> t	15
1764	23.32	0.14	0.60	none	f >>> t	25
1765	16.46	0.07	0.43	trace	f >>> t	35
1766	27.28	0.14	0.51	trace	f >>> t	50
1767	36.51	0.08	0.22	trace	f >>> t	70
1768	21.73	0.08	0.37	trace	f >>> t	30

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1769	43.86	0.18	0.41	none	f >>> t	45
1770	28.41	0.19	0.67	trace	f >>> t	30
1771	21.05	0.13	0.62	trace	f >>> t	45
1772	32.82	0.17	0.52	trace	f >>> t	20
1773	33.58	0.13	0.39	trace	f >>> t	30
1774	35.30	0.18	0.51	trace	f >>> t	5
1775	23.40	0.06	0.26	trace	f >>> t	30
1776	30.24	0.07	0.23	trace	f >>> t	45
1777	33.91	0.16	0.47	trace	f >> t	60
1778	17.74	0.07	0.39	none	f > t	30
1779	21.95	0.07	0.32	none	f >>> t	20
1780	30.92	0.16	0.52	none	f >> t	20
1781	29.44	0.36	1.22	none	f >>> t	45
1782	20.68	0.15	0.73	trace	f >>> t	25
1783	23.47	0.17	0.72	trace	f >>> t	50
1784	28.04	0.23	0.82	trace - rare	f >> t	40
1785	22.08	0.13	0.59	trace	f >> t	45
1786	20.60	0.13	0.63	trace	f >> t	50
1787	19.50	0.22	1.13	none	f <<<< t	0
1788	15.47	0.08	0.52	trace	f >> t	45
1789	30.84	1.31	4.25	trace	f >> t	5
1790	14.51	0.73	5.03	none	f >> t	3
1791	-	-	-	-	-	-
1792	26.52	0.17	0.64	trace	f >>> t	1
1793	27.41	0.05	0.18	trace	f >>> t	25
1794	23.27	0.05	0.21	trace	f >>> t	30
1795	19.15	0.09	0.47	none	f >>> t	5
1796	22.44	0.17	0.76	none	f >>> t	10
1797	25.58	0.30	1.17	none	f >>> t	10
1798	18.85	0.19	1.01	trace	f >>> t	10
1799	10.32	0.12	1.16	none	f >>> t	5
1800	33.35	0.48	1.44	none	f >>> t	10
1801	33.48	0.27	0.81	none	f >>> t	10

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1802	20.34	0.14	0.69	trace	f >>> t	1
1803	36.09	0.20	0.55	trace	f >> t	5
1804	43.63	0.41	0.94	trace	f >> t	5
1805	29.06	0.32	1.10	trace	f >> t	1
1806	33.98	0.34	1.00	none	f >>> t	1
1807	16.78	0.17	1.01	trace	f >>> t	1
1808	29.49	0.23	0.78	trace	f >>> t	10
1809	-	-	-	-	-	-
1810	16.40	0.24	1.46	none	f > t	1
1811	30.29	0.87	2.87	trace	f << t	1
1812	31.52	0.82	2.60	trace	f << t	0
1813	44.88	1.36	3.03	trace	f = t	1
1814	45.69	1.04	2.28	trace	f < t	5
1815	27.96	0.26	0.93	trace	f >>> t	10
1816	36.82	0.70	1.90	trace	f = t	5
1817	28.88	0.46	1.59	trace	f = t	15
1818	22.49	0.26	1.16	trace	f = t	10
1819	16.35	0.15	0.92	trace	f = t	5
1820	11.85	0.07	0.59	trace	f >> t	20
1821	26.79	0.17	0.63	trace - rare	f >> t	50
1822	24.04	0.32	1.33	trace	f = t	10
1823	41.14	0.23	0.56	trace	f >>> t	40
1824	14.05	0.06	0.43	trace	f >>> t	25
1825	18.65	0.60	3.22	trace	f >> t	1
1826	34.13	1.56	4.57	trace	f >> t	0
1827	39.51	1.74	4.40	trace	f >> t	0
1828	19.76	0.31	1.57	trace	f >> t	5
1829	32.79	1.29	3.93	trace	f >> t	1
1830	18.11	0.73	4.03	trace	f >> t	0
1831	30.41	1.97	6.48	trace	f >> t	0
1832	27.00	1.49	5.52	trace	f >>> t	1
1833	22.98	1.13	4.92	trace	f >>> t	1
1834	25.34	1.93	7.62	trace	f >> t	1

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1835	24.25	1.34	5.53	trace	f >>> t	1
1836	20.15	0.15	0.74	none	f >> t	20
1837	35.03	0.23	0.66	trace	f >> t	10
1838	-	-	-	-	-	-
1839	30.21	0.21	0.70	trace	f >> t	5
1840	-	-	-	-	-	-
1841	30.92	0.42	1.36	trace	f >>> t	5
1842	20.23	0.27	1.33	trace	f >>> t	1
1843	20.95	0.24	1.15	trace	f >>> t	1
1844	37.07	0.51	1.38	trace	f >> t	5
1845	49.38	0.83	1.68	trace	f >>> t	1
1846	38.70	0.94	2.43	none	f >>> t	0
1847	24.99	0.81	3.24	none	f >>> t	5
1848	23.99	0.61	2.54	trace	f >>> t	1
1849	26.18	0.62	2.37	trace	f >>> t	5
1850	11.79	0.19	1.61	trace	f >> t	1
1851	14.81	0.21	1.42	trace	f >> t	0
1852	36.38	0.39	1.07	trace	f >> t	1
1853	18.70	0.34	1.82	trace	f = t	1
1854	17.66	0.26	1.47	trace	f > t	5
1855	28.46	1.05	3.69	trace	f < t	0
1856	37.31	0.59	1.58	rare	f <<< t	0
1857	25.22	0.72	2.85	trace	f <<< t	1
1858	-	-	-	-	-	-
1859	18.67	0.24	1.29	trace	f << t	5
1860	-	-	-	-	-	-
1861	25.82	0.24	0.93	trace	f << t	5
1862	35.13	0.42	1.20	trace	f = t	5
1863	22.56	0.25	1.11	trace	f = t	20
1864	37.38	0.31	0.83	trace	f < t	5
1865	41.86	0.68	1.62	trace	f = t	10
1866	16.91	0.09	0.53	trace	f > t	10
1867	22.19	0.21	0.95	trace	f >> t	10

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1868	29.86	0.29	0.97	trace	f >> t	20
1869	27.46	0.23	0.84	none	f = t	30
1870	18.83	0.16	0.85	none	f = t	10
1871	31.84	0.31	0.97	trace	f > t	25
1872	-	-	-	-	-	-
1873	29.04	0.34	1.17	trace	f << t	5
1874	14.78	0.34	2.30	trace	f << t	5
1875	21.78	0.28	1.29	trace	f < t	3
1876	25.76	0.33	1.28	none	f << t	1
1877	-	-	-	-	-	-
1878	19.83	0.33	1.66	trace	f << t	5
1879	37.92	0.45	1.19	trace	f > t	15
1880	22.80	0.25	1.10	trace	f >> t	35
1881	24.83	0.28	1.13	trace	f >> t	40
1882	33.50	0.31	0.93	trace	f >> t	20
1883	15.64	0.16	1.02	none	f >>> t	15
1884	31.10	0.82	2.64	none	f >> t	10
1885	23.80	0.27	1.13	trace	f = t	10
1886	24.97	0.15	0.60	trace	f >> t	10
1887	25.54	0.14	0.55	trace	f >> t	10
1888	20.52	0.18	0.88	none	f >> t	5
1889	7.42	0.01	0.13	none	f >> t	75
1890	22.54	0.32	1.42	trace	f >> t	15
1891	25.00	0.31	1.24	trace	f >>> t	5
1892	21.09	0.15	0.71	none	f >>> t	20
1893	38.81	0.52	1.34	trace	f >>> t	25
1894	27.75	0.25	0.90	trace	f >>> t	15
1895	25.55	0.17	0.67	trace	f >>> t	5
1896	24.19	0.21	0.87	trace	f >>> t	10
1897	31.83	0.58	1.82	trace	f >> t	20
1898	30.89	0.61	1.97	trace	f >>> t	10
1899	25.95	0.16	0.62	none	f > t	10
1900	15.61	0.11	0.70	trace	f = t	10

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1901	20.74	0.15	0.72	trace	f > t	15
1902	20.91	0.17	0.81	trace	f << t	30
1903	30.42	0.16	0.53	trace	f < t	20
1904	42.07	0.96	2.28	trace	f > t	25
1905	20.53	0.26	1.27	none	f > t	45
1906	46.15	0.73	1.58	trace	f < t	15
1907	36.86	0.29	0.79	trace	f >> t	10
1908	24.22	0.14	0.58	none	f >>> t	30
1909	50.31	0.38	0.76	trace	f >>> t	35
1910	38.24	0.42	1.10	trace	f >>> t	35
1911	-	-	-	-	-	-
1912	17.95	0.16	0.89	trace	f >>> t	25
1913	39.36	0.39	0.99	trace	f >>> t	50
1914	16.36	0.14	0.86	trace	f >>> t	25
1915	12.43	0.07	0.56	trace	f >>> t	25
1916	26.63	0.31	1.16	none	f >>> t	40
1917	19.52	0.10	0.51	trace	f >>> t	45
1918	26.07	0.37	1.42	none	f >> t	25
1919	32.38	1.04	3.21	none	f >>> t	1
1920	9.23	0.74	8.02	none	f >>> t	0
1921	20.95	0.69	3.29	none	f >>> t	5
1922	21.90	0.44	2.01	trace	f >>> t	5
1923	23.28	0.58	2.49	trace	f >> t	5
1924	25.03	0.61	2.44	trace	f >> t	1
1925	18.53	0.43	2.32	trace	f >>> t	20
1926	25.71	0.36	1.40	trace	f >>> t	10
1927	30.29	0.35	1.16	trace	f >>> t	5
1928	28.96	0.43	1.48	none	f >>> t	10
1929	31.73	0.42	1.32	none	f >>> t	15
1930	19.71	0.58	2.94	none	f >> t	3
1931	39.01	2.02	5.18	trace	f >> t	1
1932	-	-	-	-	-	-
1933	-	-	-	-	-	-

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1934	-	-	-	-	-	-
1935	-	-	-	-	-	-
1936	-	-	-	-	-	-
1937	-	-	-	-	-	-
1938	25.23	0.50	1.98	trace	f << t	1
1939	32.23	1.04	3.23	trace	f = t	0
1940	41.25	2.18	5.28	trace	f >> t	0
1941	27.51	0.51	1.85	none	f >>> t	5
1942	22.89	0.52	2.27	trace	f >>> t	1
1943	-	-	-	-	-	-
1944	24.27	0.49	2.02	trace	f >>> t	5
1945	29.40	0.59	2.01	none	f >> t	5
1946	45.03	0.65	1.44	none	f >> t	5
1947	25.18	0.69	2.74	trace	f > t	1
1948	23.06	0.97	4.21	trace	f = t	0
1949	-	-	-	-	-	-
1950	29.18	1.14	3.91	trace	f > t	0
1951	46.44	1.32	2.84	none	f > t	5
1952	31.07	0.79	2.54	none	f >> t	1
1953	40.86	1.11	2.72	none	f >> t	5
1954	21.38	0.19	0.89	trace	f > t	45
1955	23.99	0.16	0.67	trace	f < t	20
1956	23.24	0.09	0.39	none	f >> t	50
1957	15.53	0.51	3.28	none	f <<< t	70
1958	25.12	0.32	1.27	trace	f = t	50
1959	-	-	-	-	-	-
1960	20.00	0.19	0.95	trace	f >> t	15
1961	19.27	0.17	0.88	trace	f >> t	30
1962	18.74	0.11	0.59	none	f = t	45
1963	35.29	0.29	0.82	trace	f < t	45
1964	21.78	0.33	1.52	none	f > t	25
1965	21.05	0.35	1.66	trace	f << t	30
1966	13.13	mixed with 1968	mixed with 1968	trace	f < t	55

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
1967	24.41	0.41	1.68	trace	f >> t	30
1968	23.48	mixed with 1966	mixed with 1966	none	f >> t	1
1969	18.74	0.51	2.72	trace	f >> t	1
1970	19.51	0.69	3.54	trace	f >> t	1
1971	15.51	0.67	4.32	trace	f >> t	1
1972	35.62	1.85	5.19	trace	f >> t	1
1973	32.67	2.25	6.89	none	f >> t	0
1974	34.84	1.58	4.54	trace	f = t	5
1975	-	-	-	-	-	-
1976	18.70	0.45	2.41	trace	f >> t	1
1977	25.19	1.18	4.68	none	f > t	0
1978	32.57	1.30	3.99	trace	f >> t	5
1979	37.45	1.39	3.71	trace	f > t	1
1980	31.44	1.04	3.31	none	f >> t	1
1981	-	-	-	-	-	-
1982	25.16	1.63	6.48	trace	f >> t	3
1983	29.55	0.75	2.54	trace	f > t	5
1984	-	-	-	-	-	-
1985	38.72	0.31	0.80	none	f >> t	20
1986	16.91	0.11	0.65	none	f >> t	10
1987	13.37	0.15	1.12	none	f >> t	10
1988	12.92	0.23	1.78	none	f >> t	25
1989	14.16	0.25	1.77	none	f >>> t	15
1990	20.86	0.43	2.06	trace	f >> t	0
1991	20.56	0.35	1.70	trace	f >> t	0
1992	26.09	0.60	2.30	trace	f >> t	1
1993	18.22	0.43	2.36	trace	f > t	1
1994	17.93	0.37	2.06	trace	f < t	5
1995	21.63	0.63	2.91	trace	f <<< t	1
1996	18.02	0.32	1.78	trace	f > t	3
1997	22.54	0.30	1.33	trace	f = t	10
1998	25.56	0.70	2.74	none	f = t	15
1999	22.67	0.42	1.85	none	f < t	15

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2000	-	-	-	-	-	-
2001	19.82	0.51	2.57	none	f < t	5
2002	33.54	0.81	2.42	none	f = t	1
2003	-	-	-	-	-	-
2004	25.52	0.45	1.76	trace	f = t	1
2005	22.42	0.16	0.71	trace	f > t	10
2006	16.25	0.11	0.68	none	f > t	10
2007	35.59	0.33	0.93	trace	f <<< t	15
2008	-	-	-	-	-	-
2009	18.67	0.03	0.16	trace	f < t	95
2010	32.44	0.07	0.22	none	f > t	80
2011	40.45	0.18	0.44	none	f >>> t	75
2012	-	-	-	-	-	-
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	-	-	-	-	-	-
2016	-	-	-	-	-	-
2017	18.31	0.21	1.15	trace	f >>> t	35
2018	29.02	0.65	2.24	none	f >>> t	35
2019	25.48	0.30	1.18	none	f >> t	3
2020	40.96	0.42	1.03	trace	f >>> t	5
2021	30.35	1.20	3.95	none	f >> t	5
2022	29.91	0.93	3.11	trace	f << t	3
2023	-	-	-	-	-	-
2024	-	-	-	-	-	-
2025	-	-	-	-	-	-
2026	-	-	-	-	-	-
2027	-	-	-	-	-	-
2028	-	-	-	-	-	-
2029	-	-	-	-	-	-
2030	-	-	-	-	-	-
2031	-	-	-	-	-	-
2032	-	-	-	-	-	-

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2033	38.75	0.54	1.39	trace	f >>> t	10
2034	24.28	0.23	0.95	none	f = t	20
2035	41.03	0.47	1.15	none	f > t	15
2036	29.11	0.92	3.16	none	f >> t	1
2037	20.60	0.70	3.40	none	f >>> t	0
2038	11.09	0.63	5.68	trace	f >>> t	0
2039	-	-	-	-	-	-
2040	-	-	-	-	-	-
2041	-	-	-	-	-	-
2042	-	-	-	-	-	-
2043	-	-	-	-	-	-
2044	-	-	-	-	-	-
2045	-	-	-	-	-	-
2046	-	-	-	-	-	-
2047	-	-	-	-	-	-
2048	-	-	-	-	-	-
2049	21.52	0.39	1.81	trace	f >> t	5
2050	25.64	0.43	1.68	trace	f >> t	5
2051	33.07	1.00	3.02	trace	f >> t	10
2052	32.82	0.78	2.38	trace	f >> t	5
2053	22.58	0.43	1.90	trace	f >> t	5
2054	39.07	1.01	2.59	trace	f > t	0
2055	10.31	0.48	4.66	trace	f > t	10
2056	43.44	0.93	2.14	trace	f > t	1
2057	26.97	0.51	1.89	trace	f >> t	5
2058	23.44	0.63	2.69	trace	f >> t	15
2059	31.43	1.13	3.60	trace	f >>> t	5
2060	33.20	1.01	3.04	trace	f > t	1
2061	25.99	0.53	2.04	trace	f = t	1
2062	28.12	0.33	1.17	none	f >>> t	5
2063	27.22	1.01	3.71	trace	f >>> t	0
2064	44.48	1.08	2.43	trace	f >> t	1
2065	14.67	0.46	3.14	none	f = t	1

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2066	25.24	0.80	3.17	none	f > t	1
2067	37.87	1.17	3.09	none	f >> t	1
2068	-	-	-	-	-	-
2069	22.05	0.44	2.00	trace	f >> t	0
2070	23.13	0.73	3.16	none	f >> t	1
2071	43.67	0.90	2.06	none	f > t	0
2072	32.98	0.41	1.24	trace	f < t	5
2073	33.95	0.54	1.59	none	f >> t	15
2074	27.75	1.07	3.86	trace	f >> t	0
2075	23.82	0.94	3.95	trace	f >> t	1
2076	-	-	-	-	-	-
2077	-	-	-	-	-	-
2078	-	-	-	-	-	-
2079	-	-	-	-	-	-
2080	-	-	-	-	-	-
2081	29.81	0.81	2.72	trace	f >> t	1
2082	21.84	1.14	5.22	trace	f = t	50
2083	25.94	0.81	3.12	trace	f >> t	1
2084	37.02	0.88	2.38	trace	f = t	1
2085	23.75	0.24	1.01	none	f << t	1
2086	38.29	0.55	1.44	trace	f << t	5
2087	30.15	0.25	0.83	trace	f > t	10
2088	-	-	-	-	-	-
2089	30.46	0.27	0.89	trace	f > t	5
2090	22.55	0.66	2.93	trace	f = t	30
2091	15.94	0.11	0.69	trace	f > t	20
2092	-	-	-	-	-	-
2093	-	-	-	-	-	-
2094	-	-	-	-	-	-
2095	-	-	-	-	-	-
2096	-	-	-	-	-	-
2097	32.11	0.47	1.46	trace	f = t	15
2098	12.95	0.10	0.77	trace	f > t	25

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2099	23.85	0.25	1.05	trace	f >> t	10
2100	22.90	0.20	0.87	none	f << t	5
2101	26.55	0.44	1.66	trace	f = t	10
2102	29.97	0.48	1.60	trace	f << t	20
2103	33.68	0.38	1.13	trace	f < t	10
2104	17.74	0.22	1.24	trace	f = t	10
2105	14.67	0.21	1.43	none	f <<< t	5
2106	35.06	0.44	1.25	none	f <<< t	5
2107	39.16	0.41	1.05	trace	f <<< t	5
2108	23.23	0.22	0.95	trace	f <<< t	25
2109	30.18	0.46	1.52	trace	f <<< t	10
2110	-	-	-	-	-	-
2111	-	-	-	-	-	-
2112	37.13	0.10	0.27	trace	f = t	20
2113	34.23	0.30	0.88	trace	f <<< t	1
2114	26.36	0.14	0.53	trace	f < t	60
2115						
2116	22.35	0.04	0.18	trace	f < t	40
2117						
2118						
2119	17.84	0.05	0.28	none	f << t	60
2120						
2121	34.15	0.08	0.23	none	f = t	20
2122	37.85	0.27	0.71	trace	f < t	10
2123	33.82	0.23	0.68	none	f = t	20
2124	27.87	0.64	2.30	trace	f > t	60
2125	30.59	0.56	1.83	none	f < t	50
2126	22.63	0.06	0.27	none	f = t	30
2127	-	-	-	-	-	-
2128	38.39	0.18	0.47	trace	f >> t	40
2129	14.72	0.11	0.75	trace	f >> t	25
2130	19.78	0.16	0.81	trace	f <<< t	10
2131	42.79	0.83	1.94	trace	f << t	5

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2132	33.10	0.46	1.39	none	f << t	5
2133	40.22	0.12	0.30	trace	f < t	20
2134	50.13	0.22	0.44	trace	f << t	10
2135	24.11	0.12	0.50	trace	f << t	15
2136	28.23	0.13	0.46	trace	f = t	20
2137	38.72	0.22	0.57	trace	f > t	30
2138	31.30	0.92	2.94	trace	f >>> t	5
2139	28.22	0.78	2.76	trace	f >> t	10
2140	24.92	0.63	2.53	none	f >> t	0
2141	18.18	0.47	2.59	trace	f >> t	5
2142	39.10	0.98	2.51	trace	f >> t	5
2143	21.20	1.76	8.30	none	f >>> t	0
2144	41.82	1.91	4.57	none	f >>> t	0
2145	30.78	0.52	1.69	trace	f << t	10
2146	26.79	0.30	1.12	none	f < t	5
2147	27.80	0.26	0.94	trace	f >> t	30
2148	39.20	0.31	0.79	trace	f >>> t	15
2149	25.40	0.42	1.65	trace	f >> t	10
2150	24.04	0.35	1.46	trace	f >> t	30
2151	28.75	0.24	0.83	trace	f >> t	10
2152	28.81	0.39	1.35	none	f > t	20
2153	-	-	-	-	-	-
2154	18.29	0.16	0.87	trace	f >>> t	35
2155	12.57	0.10	0.80	trace	f >> t	35
2156	-	-	-	-	-	-
2157	-	-	-	-	-	-
2158	-	-	-	-	-	-
2159	-	-	-	-	-	-
2160	-	-	-	-	-	-
2161	28.34	0.32	1.13	trace	f >>> t	5
2162	49.52	0.99	2.00	trace	f >>> t	15
2163	28.80	0.81	2.81	none	f >>> t	5
2164	-	-	-	-	-	-

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2165	20.19	0.30	1.49	trace	f >> t	5
2166	22.85	0.52	2.28	trace	f >>> t	5
2167	26.49	0.64	2.42	trace	f >> t	5
2168	19.59	0.47	2.40	trace	f >> t	10
2169	28.52	1.43	5.01	trace	f <<< t	25
2170	-	-	-	-	-	-
2171	30.18	0.29	0.96	none	f >> t	15
2172	19.29	0.29	1.50	trace	f = t	10
2173	28.51	0.45	1.58	trace	f < t	10
2174	30.86	0.60	1.94	trace	f < t	5
2175	39.62	0.70	1.77	trace	f << t	3
2176	19.14	0.71	3.71	trace	f < t	1
2177	42.69	0.52	1.22	none	f < t	10
2178	25.82	0.42	1.63	rare	f < t	3
2179	42.45	0.64	1.51	trace	f << t	1
2180	32.11	0.14	0.44	none	f << t	15
2181	34.46	0.12	0.35	trace	f <<< t	50
2182	-	-	-	-	-	-
2183	-	-	-	-	-	-
2184	-	-	-	-	-	-
2185	-	-	-	-	-	-
2186	-	-	-	-	-	-
2187	-	-	-	-	-	-
2188	-	-	-	-	-	-
2189	-	-	-	-	-	-
2190	-	-	-	-	-	-
2191	-	-	-	-	-	-
2192	-	-	-	-	-	-
2193	10.98	0.03	0.27	trace	f <<< t	50
2194	25.54	0.32	1.25	none	f <<< t	80
2195	39.23	0.04	0.10	trace	f <<< t	90
2196	23.07	0.06	0.26	none	f < t	99
2197	24.41	0.05	0.20	none	f <<< t	5

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2198	20.03	0.03	0.15	none	f <<< t	75
2199	34.24	0.41	1.20	trace	f <<< t	10
2200	23.36	0.02	0.09	none	f <<< t	90
2201	19.20	0.02	0.10	none	f <<< t	97
2202	27.21	0.06	0.22	none	f <<< t	40
2203	31.66	0.06	0.19	trace	f <<< t	30
2204	-	-	-	-	-	-
2205	33.41	0.04	0.12	none	f <<< t	50
2206	23.64	0.15	0.63	trace	f <<< t	10
2207	-	-	-	-	-	-
2208	-	-	-	-	-	-
2209	24.60	0.03	0.12	trace	f <<< t	70
2210	35.54	0.31	0.87	trace	f <<< t	60
2211	35.89	0.01	0.03	trace	f <<< t	20
2212	18.46	0.01	0.05	trace	f <<< t	50
2213	51.16	0.08	0.16	none	f <<< t	90
2214	32.19	0.09	0.28	trace	f <<< t	90
2215	39.84	0.03	0.08	none	f <<< t	45
2216	34.02	0.09	0.26	none	f <<< t	15
2217	35.40	0.07	0.20	none	f <<< t	85
2218	-	-	-	-	-	-
2219	-	-	-	-	-	-
2220	-	-	-	-	-	-
2221	-	-	-	-	-	-
2222	-	-	-	-	-	-
2223	-	-	-	-	-	-
2224	-	-	-	-	-	-
2225	20.63	0.16	0.78	trace	f <<< t	5
2226	20.54	0.21	1.02	none	f <<< t	90
2227	34.88	0.16	0.46	none	f <<< t	5
2228	33.27	0.17	0.51	none	f <<< t	15
2229	47.13	0.13	0.28	none	f <<< t	10
2230	23.14	0.13	0.56	trace	f <<< t	10

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2231	34.03	0.16	0.47	trace	f <<< t	10
2232	28.33	0.10	0.35	none	f <<< t	20
2233	38.31	0.28	0.73	trace	f <<< t	10
2234	-	-	-	-	-	-
2235	-	-	-	-	-	-
2236	-	-	-	-	-	-
2237	-	-	-	-	-	-
2238	-	-	-	-	-	-
2239	-	-	-	-	-	-
2240	-	-	-	-	-	-
2241	20.12	0.21	1.04	none	f <<< t	10
2242	19.20	0.20	1.04	trace	f <<< t	15
2243	14.27	0.18	1.26	trace	f <<< t	15
2244	12.84	0.04	0.31	trace	f << t	60
2245	26.58	0.16	0.60	trace	f <<< t	25
2246	-	-	-	-	-	-
2247	21.80	0.25	1.15	trace	f <<< t	15
2248	-	-	-	-	-	-
2249	26.80	0.13	0.49	none	f <<< t	10
2250	29.44	0.31	1.05	none	f <<< t	5
2251	27.86	0.35	1.26	none	f <<< t	5
2252	23.04	0.07	0.30	none	f < t	15
2253	32.57	0.05	0.15	none	f = t	3
2254	29.81	0.04	0.13	trace	f = t	1
2255	-	-	-	-	-	-
2256	-	-	-	-	-	-
2257	38.42	0.24	0.62	trace	f << t	10
2258	13.81	0.05	0.36	trace	f << t	25
2259	36.42	0.20	0.55	trace	f <<< t	30
2260	21.22	0.09	0.42	trace	f = t	45
2261	24.12	0.09	0.37	trace	f << t	35
2262	16.45	0.07	0.43	none	f << t	20
2263	34.89	0.23	0.66	trace	f << t	5

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2264	24.88	0.24	0.96	trace	f << t	5
2265	30.61	0.17	0.56	trace	f = t	15
2266	40.57	0.34	0.84	none	f > t	40
2267	-	-	-	-	-	-
2268	-	-	-	-	-	-
2269	-	-	-	-	-	-
2270	29.70	0.30	1.01	trace	f >> t	3
2271	42.32	0.35	0.83	trace	f >>> t	0
2272	32.00	0.24	0.75	trace	f >> t	20
2273	38.19	0.10	0.26	trace	f >> t	80
2274	27.36	0.06	0.22	trace	f >> t	75
2275	35.82	0.17	0.47	trace	f >> t	75
2276	26.21	0.15	0.57	none	f >> t	85
2277	31.82	0.29	0.91	none	f >>> t	5
2278	-	-	-	-	-	-
2279	25.03	0.32	1.28	trace	f >>> t	0
2280	24.22	0.49	2.02	trace	f >>> t	1
2281	43.72	0.51	1.17	none	f >> t	1
2282	25.82	0.34	1.32	trace	f >> t	3
2283	32.85	0.39	1.19	trace	f >>> t	5
2284	-	-	-	-	-	-
2285	-	-	-	-	-	-
2286	-	-	-	-	-	-
2287	-	-	-	-	-	-
2288	-	-	-	-	-	-
2289	24.51	0.30	1.22	trace	f >> t	3
2290	-	-	-	-	-	-
2291	-	-	-	-	-	-
2292	-	-	-	-	-	-
2293	30.76	0.19	0.62	none	f > t	5
2294	27.72	0.28	1.01	trace	f > t	7
2295	14.74	0.12	0.81	trace	f = t	10
2296	48.97	1.33	2.72	none	f > t	15

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2297	36.91	0.41	1.11	trace	f <<< t	1
2298	47.20	0.47	1.00	trace	f >> t	1
2299	-	-	-	-	-	-
2300	-	-	-	-	-	-
2301	-	-	-	-	-	-
2302	-	-	-	-	-	-
2303	-	-	-	-	-	-
2304	-	-	-	-	-	-
2305	27.21	0.50	1.84	none	f = t	5
2306	46.87	0.90	1.92	trace	f > t	1
2307	30.02	0.18	0.60	none	f >> t	10
2308	29.56	0.21	0.71	none	f > t	10
2309	22.09	0.30	1.36	trace	f < t	5
2310	25.54	0.46	1.80	trace	f << t	2
2311	32.81	0.26	0.79	trace	f >> t	40
2312	32.08	0.21	0.65	none	f >>> t	30
2313	16.56	0.11	0.66	none	f >>> t	45
2314	44.82	0.74	1.65	none	f >> t	20
2315	25.16	0.14	0.56	none	f >>> t	1
2316	23.56	0.18	0.76	none	f >> t	5
2317	41.33	0.40	0.97	trace	f > t	5
2318	30.75	0.25	0.81	none	f >> t	10
2319	-	-	-	-	-	-
2320	-	-	-	-	-	-
2321	29.21	0.75	2.57	trace	f > t	5
2322	40.91	0.36	0.88	trace	f >>> t	25
2323	31.65	0.22	0.70	trace	f = t	5
2324	19.21	0.08	0.42	trace	f > t	40
2325	26.48	0.19	0.72	trace	f << t	10
2326	27.36	0.21	0.77	trace	f > t	40
2327	29.13	0.32	1.10	none	f > t	50
2328	17.49	0.19	1.09	trace	f << t	5
2329	-	-	-	-	-	-

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2330	-	-	-	-	-	-
2331	-	-	-	-	-	-
2332	-	-	-	-	-	-
2333	-	-	-	-	-	-
2334	-	-	-	-	-	-
2335	-	-	-	-	-	-
2336	-	-	-	-	-	-
2337	30.03	0.39	1.30	none	f < t	25
2338	37.90	0.53	1.40	none	f = t	5
2339	45.00	0.39	0.87	none	f > t	30
2340	43.39	0.60	1.38	trace	f > t	5
2341	42.31	0.43	1.02	trace	f >> t	10
2342	36.36	0.55	1.51	trace	f >> t	2
2343	30.50	0.56	1.84	none	f >> t	0
2344	21.17	0.40	1.89	trace	f > t	1
2345	26.03	0.36	1.38	trace	f < t	3
2346	22.58	0.22	0.97	trace	f = t	3
2347	19.24	0.49	2.55	none	f > t	1
2348	8.26	0.29	3.51	none	f > t	1
2349	-	-	-	-	-	-
2350	-	-	-	-	-	-
2351	-	-	-	-	-	-
2352	-	-	-	-	-	-
2353	24.32	1.29	5.30	trace	f >> t	0
2354	25.56	1.47	5.75	trace	f >> t	1
2355	25.95	0.72	2.77	trace	f = t	0
2356	46.46	2.03	4.37	trace	f < t	0
2357	36.20	2.23	6.16	trace	f < t	0
2358	46.27	0.66	1.43	trace	f > t	3
2359	42.72	0.95	2.22	none	f >> t	5
2360	40.80	1.49	3.65	trace	f > t	2
2361	46.28	1.95	4.21	trace	f > t	0
2362	44.90	1.15	2.56	trace	f = t	0

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2363	62.20	1.62	2.60	trace	f < t	1
2364	42.27	0.49	1.16	trace	f >> t	5
2365	22.84	0.33	1.44	trace	f >> t	10
2366	47.64	0.80	1.68	none	f > t	3
2367	41.26	0.65	1.58	trace	f >> t	1
2368	18.95	0.34	1.79	trace	f >>> t	1
2369	30.17	0.88	2.92	trace	f = t	3
2370	29.53	0.70	2.37	none	f << t	1
2371	30.79	0.40	1.30	none	f < t	1
2372	38.67	0.37	0.96	none	f > t	10
2373	24.18	0.71	2.94	none	f << t	1
2374	27.25	0.47	1.72	none	f < t	2
2375	31.80	0.87	2.74	trace	f << t	1
2376	22.85	0.52	2.28	none	f << t	0
2377	26.16	0.56	2.14	trace	f >> t	1
2378	22.11	0.54	2.44	none	f > t	0
2379	23.96	0.39	1.63	none	f < t	1
2380	31.44	0.53	1.69	none	f << t	5
2381	33.79	0.80	2.37	none	f << t	1
2382	34.44	0.59	1.71	trace	f < t	5
2383	18.24	0.30	1.64	none	f > t	1
2384	29.97	0.77	2.57	trace	f > t	0
2385	16.11	0.81	5.03	none	f >> t	0
2386	24.38	1.49	6.11	trace	f >> t	0
2387	26.23	1.36	5.18	none	f > t	5
2388	27.58	1.92	6.96	none	f >> t	0
2389	19.96	2.08	10.42	none	f >> t	1
2390	56.55	5.55	9.81	none	f >>>> t	0
2391	50.31	0.74	1.47	trace	f > t	50
2392	42.36	0.46	1.09	trace	f = t	75
2393	29.79	0.35	1.17	trace	f >> t	50
2394	36.20	0.39	1.08	none	f < t	20
2395	36.05	0.46	1.28	trace	f > t	90

Sample No.	Sample Weight (gm)	Coarse (>38μ) Weight (gm)	Coarse Fraction (%)	Amount of Ash	Biogenic (f) to Terrigenous (t)	Amount of Opaques (%)
2396	43.46	0.41	0.94	none	f >> t	25
2397	-	-	-	-	-	-
2398	-	-	-	-	-	-
2399	-	-	-	-	-	-
2400	-	-	-	-	-	-

APPENDIX C

Electron-microprobe data for samples 1543, 1564, 1640, 1640 (2), 1856, and 2178

SAMPLE: T151-1 E67-113 1543

PT	BEAM COUNTS	NA COUNTS	9 SD	MG COUNTS	8 SD	AL COUNTS	3 SD	SI COUNTS	7 SD	K COUNTS	2 SD	CA COUNTS	6 SD	TI COUNTS	5 SD	MN COUNTS	1 SD	FE COUNTS	4 SD
1	27946	751	27	819	29	2105	46	19073	138	7624	87	629	25	16	4	57	8	113	11
2	27946	921	120	925	75	2219	80	18190	624	9197	****	634	4	28	8	46	8	134	15
3	27941	749	99	420	266	1812	210	21059	****	7721	881	469	94	27	7	66	10	111	13

LINES DELETED:

AVE. BEAM CURRENT/SEC = 1397

DATA REDUCED USING $B-AL: $LL9M

ON SPECIMEN: T151-1 E67-113 1543

$B-AL VERSION 1.0

OXIDE FORM.	WEIGHTZ (OXIDE)	STD.DEV. (Z)	HOMO. INDEX	FORMULA	K-RATIO	UNKN PEAK (COUNTS)	UNKN BKGD (COUNTS)	COUNTING TIME(SEC)	STD PEAK (COUNTS)	STD BKGD (COUNTS)	COUNTING TIME(SEC)	STANDARD FILENAME
NA2O	2.133	4.60	3.476	0.000	0.54198	807.0	31.0	20.00	1462.4	30.5	20.00	ZRGSC
MGO	0.735	5.47	9.918	0.000	0.19543	721.1	145.8	20.00	3090.1	146.4	20.00	ZRGSC
AL2O3	14.915	3.24	4.644	0.000	1.13274	2045.2	5.3	20.00	1806.2	5.3	20.00	Z5831
SIO2	64.655	0.98	10.539	0.000	0.86458	19440.3	47.8	20.00	22479.3	49.3	20.00	Z5831
K2O	4.028	1.65	9.745	0.000	1.10630	8180.9	142.6	20.00	7424.1	158.2	20.00	ZRGSC
CAO	0.243	8.59	3.908	0.000	0.04791	576.9	240.7	20.00	7284.8	267.8	20.00	ZRGSC
TIO2	0.026	134.71	1.364	0.000	0.00024	23.5	18.7	20.00	20337.3	26.7	20.00	ZTIO2
MNO	0.008	294.88	1.331	0.000	0.00008	56.0	52.4	20.00	43977.8	109.3	20.00	ZMN2O
FEO	0.075	39.43	1.158	0.000	0.01163	119.7	83.5	20.00	3208.3	96.3	20.00	ZRGSC

TOTAL 86.817 NO. OXYGENS = 0 NO. ITERS. = 2 AVE. ATOMIC NO. = 10.68

SAMPLE: T151-3 E67-113 1564

PT	BEAM COUNTS	NA COUNTS	9 SD	MG COUNTS	8 SD	AL COUNTS	3 SD	SI COUNTS	7 SD	K COUNTS	2 SD	CA COUNTS	6 SD	TI COUNTS	5 SD	MN COUNTS	1 SD	FE COUNTS	4 SD
1	27762	674	26	853	29	2264	48	20341	143	9573	98	801	28	19	4	70	8	175	13
2	27750	741	48	432	298	1999	187	21744	992	8616	676	657	102	12	5	42	20	149	18
3	27737	588	77	693	213	2092	134	20577	751	7522	****	1009	177	14	4	50	14	155	14
4	27741	786	86	516	188	1974	131	20639	626	9014	867	840	145	17	3	55	12	243	43
5	27742	683	75	820	185	2154	118	17278	****	7687	872	876	127	19	3	53	10	127	44
6	27744	913	111	358	207	1894	134	21729	****	8133	793	716	124	16	3	58	9	145	41
7	27748	913	123	642	189	1981	126	20816	****	8909	747	720	119	16	3	61	9	158	38
8	27734	901	125	497	180	2047	117	21744	****	7989	714	763	111	17	2	52	8	164	35
9	27747	698	119	488	173	1869	125	21946	****	8089	678	949	115	20	3	73	10	150	33
10	27741	622	121	658	164	1820	135	17348	****	7846	662	574	133	9	3	52	9	155	31

LINES DELETED: 6 7 8

AVE. BEAM CURRENT/SEC = 1387

DATA REDUCED USING $B-AL: $GL9M

ON SPECIMEN: T151-3 E67-113 1564

$B-AL VERSION 1.0

OXIDE FORM.	WEIGHT% (OXIDE)	STD.DEV. (%)	HOMO. INDEX	FORMULA	K-RATIO	UNKN PEAK (COUNTS)	UNKN BKGD (COUNTS)	COUNTING TIME(SEC)	STD PEAK (COUNTS)	STD BKGD (COUNTS)	COUNTING TIME(SEC)	STANDARD FILENAME
NA2O	1.795	4.90	2.558	0.000	0.45654	684.6	30.9	20.00	1462.4	30.5	20.00	ZRGSC
MGO	0.626	6.01	6.523	0.000	0.16689	637.1	145.9	20.00	3090.1	146.4	20.00	ZRGSC
AL2O3	14.715	3.25	3.489	0.000	1.12116	2024.4	5.3	20.00	1806.2	5.3	20.00	ZS831
SIO2	66.267	0.98	13.584	0.000	0.88872	19982.0	48.0	20.00	22479.3	49.3	20.00	ZS831
K2O	4.107	1.64	8.308	0.000	1.12746	8335.5	143.5	20.00	7424.1	158.2	20.00	ZRGSC
CAO	0.414	5.81	5.408	0.000	0.08164	815.0	242.2	20.00	7284.8	267.8	20.00	ZRGSC
TIO2	0.000	192.07	1.047	0.000	0.00000	15.7	18.8	20.00	20337.3	26.7	20.00	ZTIO2
MNO	0.008	289.30	1.479	0.000	0.00008	56.5	52.9	20.00	43977.8	109.3	20.00	ZMN2O
FEO	0.167	19.59	2.901	0.000	0.02602	165.1	84.2	20.00	3208.3	96.3	20.00	ZRGSC

TOTAL 88.099 NO. OXYGENS = 0 NO. ITERS. = 2 AVE. ATOMIC NO. = 10.74

SAMPLE: T151-7 E67-113 1640

PT	BEAM COUNTS	NA COUNTS	9 SD	MG COUNTS	8 SD	AL COUNTS	3 SD	SI COUNTS	7 SD	K COUNTS	2 SD	CA COUNTS	6 SD	TI COUNTS	5 SD	MN COUNTS	1 SD	FE COUNTS	4 SD
1	27937	908	30	894	30	2248	47	18506	136	6109	78	920	30	23	5	54	7	163	13
2	28001	314	421	449	315	1796	320	20593	****	5036	759	2778	****	10	9	50	3	167	3
3	27952	31	448	169	366	13	****	32605	****	145	****	262	****	24	8	50	2	102	36
4	27986	874	431	673	310	2127	****	20050	****	7077	****	940	****	16	7	59	4	304	85
5	27978	675	379	427	274	1768	906	21657	****	6261	****	535	987	12	6	55	4	377	113
6	27978	1264	444	442	247	1938	823	21976	****	5825	****	603	904	18	6	62	5	171	104
7	27968	676	405	654	232	2026	764	21284	****	5960	****	941	826	20	5	69	7	174	96
8	27959	126	423	136	256	91	909	33765	****	318	****	261	808	18	5	31	11	107	96
9	27962	669	396	543	241	1857	858	21096	****	6179	****	1033	757	18	5	61	11	180	90
10	27961	1093	403	917	264	2145	831	20191	****	7848	****	794	714	27	5	54	10	112	88
11	27889	252	402	156	275	180	898	29671	****	568	****	252	706	46	10	46	10	89	89
12	27889	514	384	789	275	1740	859	12872	****	4952	****	795	673	10	10	47	10	98	88
13	27891	1074	389	370	267	2010	835	21678	****	6860	****	773	645	29	10	51	9	203	84
14	27902	965	383	419	258	1739	804	20980	****	6734	****	657	621	23	9	61	9	132	82
15	27899	958	377	962	275	2391	805	19706	****	5762	****	1162	605	20	9	68	10	192	79
16	27888	54	397	2647	592	1155	786	14791	****	524	****	451	593	37	9	59	9	3491	833
17	27878	1095	399	349	578	1794	763	22795	****	6361	****	433	582	17	9	63	9	119	809
18	27883	1315	415	478	562	1900	743	20968	****	7188	****	702	565	15	9	69	9	119	787
19	27877	957	408	813	548	2188	735	19798	****	7626	****	983	551	16	9	62	9	91	767
20	27876	578	398	330	538	1329	718	16057	****	3547	****	964	537	17	9	45	9	130	748

LINES DELETED: 2 3 11 8 16 20

AVE. BEAM CURRENT/SEC = 1396

DATA REDUCED USING 9B-AL: 8GL9M

ON SPECIMEN: T151-7 E67-113 1640

9B-AL VERSION 1.0

OXIDE FORM.	WEIGHT% (OXIDE)	STD.DEV. (%)	HOMO. INDEX	FORMULA	K-RATIO	UNKN PEAK (COUNTS)	UNKN BKGD (COUNTS)	COUNTING TIME(SEC)	STD PEAK (COUNTS)	STD BKGD (COUNTS)	COUNTING TIME(SEC)	STANDARD FILENAME
NA2O	2.464	4.38	7.664	0.000	0.62874	931.2	30.9	20.00	1462.4	30.5	20.00	%RGSC
MGO	0.611	6.12	9.754	0.000	0.16232	623.7	145.8	20.00	3090.1	146.4	20.00	%RGSC
AL2O3	14.502	3.26	4.622	0.000	1.10253	1990.8	5.3	20.00	1806.2	5.3	20.00	%5831
SIO2	67.225	0.97	16.801	0.000	0.90085	20254.1	47.9	20.00	22479.3	49.3	20.00	%5831
K2O	3.180	1.76	9.799	0.000	0.87238	6481.5	142.9	20.00	7424.1	158.2	20.00	%RGSC
CAO	0.407	5.87	7.226	0.000	0.08038	805.2	241.1	20.00	7284.8	267.8	20.00	%RGSC
TIO2	0.000	20497.	1.221	0.000	0.00000	18.7	18.7	20.00	20337.3	26.7	20.00	%TIO2
MNO	0.015	156.93	0.872	0.000	0.00015	59.3	52.6	20.00	43977.8	109.3	20.00	%MN2O
FEO	0.186	17.89	6.084	0.000	0.02898	173.9	83.7	20.00	3208.3	96.3	20.00	%RGSC

TOTAL 88.591 NO. OXYGENS = 0 NO. ITERS. = 2 AVE. ATOMIC NO. = 10.69

SAMPLE: T151-7 E67-113 1640

PT	BEAM COUNTS	NA COUNTS	9 SD	MG COUNTS	8 SD	AL COUNTS	3 SD	SI COUNTS	7 SD	K COUNTS	2 SD	CA COUNTS	6 SD	TI COUNTS	5 SD	MN COUNTS	1 SD	FE COUNTS	4 SD
1	27814	648	25	422	21	1823	43	20953	145	5639	75	1136	34	14	4	66	8	676	26
2	27827	809	114	315	76	1428	279	19593	962	1617	####	1654	366	25	8	56	7	363	221
3	27856	820	97	710	205	2091	333	20546	698	6072	####	1135	300	18	6	44	11	148	265
4	27872	686	87	344	181	1886	277	22356	####	6781	####	521	464	16	5	69	11	186	241
5	27882	1165	204	875	247	2156	286	20114	####	8292	####	800	425	24	5	61	10	112	233
6	27886	612	202	1174	343	2250	298	16996	####	6874	####	1088	381	49	13	68	9	197	212
7	27889	553	205	374	329	1865	274	22270	####	6505	####	557	395	23	12	44	11	201	196
8	27873	1071	220	1123	356	2420	307	18643	####	8014	####	810	371	14	11	67	10	136	187
9	27868	23	330	147	375	9	720	33338	####	155	####	264	418	11	11	53	10	106	182
10	27868	1176	344	782	358	2204	693	20528	####	6750	####	1061	398	14	11	44	10	181	172
11	27870	906	330	785	343	2088	662	19883	####	6589	####	732	381	16	11	38	11	121	167
12	27864	99	369	156	356	70	812	32512	####	290	####	243	408	25	10	60	11	106	163
13	27872	1144	373	368	347	1883	779	21673	####	6344	####	785	391	18	10	55	11	301	158
14	27872	726	358	416	336	1781	749	21512	####	6147	####	977	378	53	13	74	11	180	152
15	27878	189	374	457	325	1840	723	22107	####	1343	####	4239	950	18	12	37	12	185	146
16	27879	724	361	305	321	1913	700	22258	####	5415	####	703	922	15	12	62	12	199	142
17	27867	399	358	459	311	1831	678	21398	####	4046	####	1523	901	20	12	55	11	195	137
18	27880	601	348	470	302	2005	661	22345	####	6137	####	672	879	17	11	50	11	91	136
19	27879	1080	350	484	294	1914	643	21879	####	7984	####	512	863	20	11	48	11	134	133
20	27881	883	343	591	287	2089	630	21056	####	7140	####	800	841	21	11	60	11	177	130

LINES DELETED: 9 12 15 6 2

AVE. BEAM CURRENT/SEC = 1394

DATA REDUCED USING $B-AL: $GL9M

ON SPECIMEN: T151-7 E67-113 1640

$B-AL VERSION 1.0

OXIDE FORM.	WEIGHTZ (OXIDE)	STD.DEV. (Z)	HOMO. INDEX	FORMULA	K-RATIO	UNKN PEAK (COUNTS)	UNKN BKGD (COUNTS)	COUNTING TIME(SEC)	STD PEAK (COUNTS)	STD BKGD (COUNTS)	COUNTING TIME(SEC)	STANDARD FILENAME
NA2O	2.200	4.54	8.506	0.000	0.56420	838.8	30.9	20.00	1462.4	30.5	20.00	ZRGSC
MGO	0.535	6.63	9.951	0.000	0.14310	567.1	145.9	20.00	3090.1	146.4	20.00	ZRGSC
AL2O3	14.474	3.26	3.941	0.000	1.10573	1996.6	5.3	20.00	1806.2	5.3	20.00	Z5831
SIO2	70.011	0.96	7.377	0.000	0.94128	21161.0	48.1	20.00	22479.3	49.3	20.00	Z5831
K2O	3.204	1.75	13.506	0.000	0.87805	6523.8	144.0	20.00	7424.1	158.2	20.00	ZRGSC
CAO	0.439	5.60	9.463	0.000	0.08625	848.2	243.0	20.00	7284.8	267.8	20.00	ZRGSC
TIO2	0.007	485.43	2.136	0.000	0.00006	20.1	18.8	20.00	20337.3	26.7	20.00	ZTIO2
MNO	0.006	416.43	1.451	0.000	0.00006	55.6	53.1	20.00	43977.8	109.3	20.00	ZMN2O
FEO	0.243	14.49	9.853	0.000	0.03788	202.5	84.6	20.00	3208.3	96.3	20.00	ZRGSC

TOTAL 91.119 NO. OXYGENS = 0 NO. ITERS. = 2 AVE. ATOMIC NO. = 10.77

SAMPLE: T151-11 E67-113 1856

PT	BEAM COUNTS	NA COUNTS	9 SD	MG COUNTS	8 SD	AL COUNTS	3 SD	SI COUNTS	7 SD	K COUNTS	2 SD	CA COUNTS	6 SD	TI COUNTS	5 SD	MN COUNTS	1 SD	FE COUNTS	4 SD
1	27802	963	31	487	22	1837	43	19738	140	6559	81	779	28	17	4	52	7	209	14
2	27786	456	358	367	85	1830	5	22508	****	2984	****	2569	****	24	5	65	9	119	64
3	27784	847	266	662	148	2034	116	20125	****	6177	****	887	****	19	4	57	7	161	45
4	27794	926	233	766	178	2324	232	19781	****	6065	****	1071	837	25	4	52	6	112	45
5	27779	885	205	431	166	1925	204	21595	****	5041	****	1234	726	26	4	46	7	182	41
6	27768	837	184	304	178	1740	209	22405	****	4971	****	1011	661	15	5	53	6	276	61
7	27767	636	182	447	164	1928	191	22193	****	5143	****	1319	604	31	6	71	9	179	56
8	27766	954	178	297	167	1906	178	22294	****	5944	****	757	587	16	6	58	8	135	54
9	27753	1232	217	1019	240	2371	219	19395	****	5783	****	802	565	15	6	63	8	107	55
10	27754	847	205	564	227	1993	207	21665	****	7155	****	681	554	17	6	45	8	92	56
11	27744	772	196	500	215	1879	199	21060	****	7064	****	834	532	18	5	51	8	168	54
12	27750	738	190	465	206	1813	196	21807	****	6691	****	798	514	17	5	56	8	293	64
13	27763	805	182	548	198	2036	188	20284	****	6380	****	909	494	19	5	52	7	135	62
14	27765	837	175	429	192	1944	181	21396	****	7418	****	726	483	17	5	61	7	172	60
15	27767	496	190	389	188	1871	176	21937	****	3772	****	3151	719	21	5	57	7	134	58

LINES DELETED: 2 7 9 15

AVE. BEAM CURRENT/SEC = 1388

DATA REDUCED USING 0B-AL: $GL9M

ON SPECIMEN: T151-11 E67-113 1856

0B-AL VERSION 1.0

OXIDE FORM.	WEIGHTZ (OXIDE)	STD.DEV. (Z)	HOMO. INDEX	FORMULA	K-RATIO	UNKN PEAK (COUNTS)	UNKN BKGD (COUNTS)	COUNTING TIME(SEC)	STD PEAK (COUNTS)	STD BKGD (COUNTS)	COUNTING TIME(SEC)	STANDARD FILENAME
NA2O	2.249	4.51	2.443	0.000	0.57592	855.6	30.9	20.00	1462.4	30.5	20.00	ZRGSC
MGO	0.445	7.49	6.252	0.000	0.11887	495.8	145.9	20.00	3090.1	146.4	20.00	ZRGSC
AL2O3	14.134	3.28	3.506	0.000	1.07898	1948.4	5.3	20.00	1806.2	5.3	20.00	Z5831
SIO2	69.779	0.96	6.708	0.000	0.93876	21104.5	48.0	20.00	22479.3	49.3	20.00	Z5831
K2O	3.100	1.77	10.017	0.000	0.84938	6315.1	143.5	20.00	7424.1	158.2	20.00	ZRGSC
CAO	0.462	5.39	5.612	0.000	0.09097	880.6	242.3	20.00	7284.8	267.8	20.00	ZRGSC
TIO2	0.000	9034.8	0.819	0.000	0.00000	18.7	18.8	20.00	20337.3	26.7	20.00	ZTIO2
MNO	0.000	9615.6	0.665	0.000	0.00000	53.0	52.9	20.00	43977.8	109.3	20.00	ZMN2O
FEO	0.189	17.67	4.751	0.000	0.02951	176.1	84.2	20.00	3208.3	96.3	20.00	ZRGSC

TOTAL 90.359 NO. OXYGENS = 0 NO. ITERS. = 2 AVE. ATOMIC NO. = 10.74

SAMPLE: T151-12 E67-113 2178

PT	BEAM COUNTS	NA COUNTS	9 SD	MG COUNTS	8 SD	AL COUNTS	3 SD	SI COUNTS	7 SD	K COUNTS	2 SD	CA COUNTS	6 SD	TI COUNTS	5 SD	MN COUNTS	1 SD	FE COUNTS	4 SD
1	27772	1365	37	591	24	2055	45	20701	144	6172	79	702	26	24	5	69	8	276	17
2	27772	1200	117	777	131	2246	135	19562	805	4776	987	765	45	21	2	37	23	174	72
3	27761	1323	86	382	197	1865	191	20354	583	5636	704	865	82	20	2	59	16	1249	593
4	27756	1299	70	496	167	1871	181	21268	714	6839	872	581	119	19	2	59	14	120	533
5	27765	1188	78	807	181	2134	166	18937	924	6497	808	835	114	16	3	48	12	728	478
6	27757	1231	72	473	172	1931	155	19624	855	5609	738	1345	263	15	3	57	11	258	439
7	27759	1201	70	829	181	2169	152	20173	781	6480	706	715	246	18	3	52	10	226	411
8	27777	1480	102	402	185	1860	154	22431	****	6389	668	703	232	18	3	56	9	430	381
9	27777	1087	116	354	191	1843	155	21394	****	6089	625	977	224	25	3	59	9	288	359
10	27768	1055	128	856	202	2254	168	18753	****	6438	602	809	211	11	4	68	9	170	348
11	27742	1383	128	702	194	2173	165	20088	****	5130	640	912	202	18	4	67	9	105	341
12	27745	1332	124	336	201	1847	167	21622	****	5250	648	504	215	18	4	55	9	119	333
13	27744	1314	120	438	196	1884	164	21375	****	5548	630	682	209	18	4	50	9	146	323
14	27739	1172	118	316	201	1740	174	22710	****	5183	636	582	209	16	4	69	9	338	311
15	27749	1278	114	366	200	1914	168	21408	****	6868	666	771	201	18	3	56	9	429	301
16	27762	1030	124	787	202	2188	170	19250	****	6301	650	731	195	16	3	68	9	121	295
17	27767	1148	122	415	199	1832	170	21360	****	5701	632	783	189	11	4	65	9	187	288
18	27779	1012	131	276	203	1828	169	22145	****	5868	614	509	194	14	4	55	9	119	283
19	27784	1160	128	849	210	2424	193	19107	****	3817	769	1036	198	15	4	53	8	567	282
20	27815	1312	126	371	209	1847	191	21546	****	5022	769	758	193	21	4	53	8	154	277

LINES DELETED: 3

AVE. BEAM CURRENT/SEC = 1388

DATA REDUCED USING $B-AL: $GL9M

ON SPECIMEN: T151-12 E67-113 2178

$B-AL VERSION 1.0

OXIDE FORM.	WEIGHTZ (OXIDE)	STD.DEV. (Z)	HOMO. INDEX	FORMULA	K-RATIO	UNKN PEAK (COUNTS)	UNKN BKGD (COUNTS)	COUNTING TIME(SEC)	STD PEAK (COUNTS)	STD BKGD (COUNTS)	COUNTING TIME(SEC)	STANDARD FILENAME
NA2O	3.245	4.01	3.641	0.000	0.83290	1223.6	30.9	20.00	1462.4	30.5	20.00	ZRGSC
MGO	0.517	6.81	9.001	0.000	0.13712	549.5	145.9	20.00	3090.1	146.4	20.00	ZRGSC
AL2O3	14.594	3.26	4.338	0.000	1.10878	2002.1	5.3	20.00	1806.2	5.3	20.00	Z5831
SIO2	68.775	0.97	8.594	0.000	0.92110	20708.2	48.1	20.00	22479.3	49.3	20.00	Z5831
K2O	2.834	1.82	10.380	0.000	0.77687	5788.2	143.6	20.00	7424.1	158.2	20.00	ZRGSC
CAO	0.384	6.12	7.096	0.000	0.07573	773.7	242.3	20.00	7284.8	267.8	20.00	ZRGSC
TIO2	0.000	456.73	0.878	0.000	0.00000	17.5	18.8	20.00	20337.3	26.7	20.00	ZTIO2
MNO	0.011	219.23	1.116	0.000	0.00011	57.7	52.9	20.00	43977.8	109.3	20.00	ZMN2O
FEO	0.364	10.68	10.586	0.000	0.05677	260.9	84.2	20.00	3208.3	96.3	20.00	ZRGSC

TOTAL 90.725 NO. OXYGENS = 0 NO. ITERS. = 2 AVE. ATOMIC NO. = 10.74

APPENDIX D

This appendix consists of tephra data from core E67-113 compared with tephra data from the database at the U. S. Geological Survey, Menlo Park, California. The database contains tephra from most North American and many Central and Latin American volcanic eruptions.

The best 50 matches are calculated using four combinations of major elements for each sample - I. 1543, II. 1564, III. 1640, IV. 1640 (2), V. 1856, and VI. 2178. The combinations of elements are:

Na, Si, Al, and Ca
Na, Si, Al, K, and Ca
Na, Si, Al, K, Ca, and Fe
Na, Si, Al, K, Ca, and Mg

The first correlation on each page is the sample used in the comparison against itself. Similarity coefficients are in the last column for each comparison.

I. Listing of 50 closest matches for COMP. NO. 1898 for elements: Na, Al, Si, Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total.R	Sim. Co
1	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	1.0000
2	2165	WCR-88-C (LO FE) T177-15	12/7/88	76.95	11.79	1.09	0.05	0.07	0.26	0.12	2.45	7.23	100.01	0.8946
3	2161	WCR-88-A (LO FE) T177-13	12/7/88	75.83	12.80	1.22	0.05	0.10	0.30	0.10	2.24	7.38	100.02	0.8928
4	1367	BO-107-1 T104-6	8/26/85	76.82	12.65	0.88	0.03	0.06	0.28	0.12	2.96	6.20	100.00	0.8842
5	1449	126-1176 t115-11	1/28/85	78.18	12.32	0.96	0.04	0.10	0.30	0.12	2.18	5.80	100.00	0.8723
6	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.8642
7	1834	FLV-9-CS T145-12	8/24/87	77.36	12.31	0.56	0.05	0.10	0.32	0.06	2.77	6.47	100.00	0.8606
8	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.8570
9	1836	FLV-11-CS T145-14	8/25/87	77.08	12.69	0.57	0.05	0.09	0.34	0.07	2.75	6.38	100.02	0.8557
10	932	DR-42		76.15	12.32	1.37	0.07	0.10	0.33	0.24	2.81	6.61	100.00	0.8547
11	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.8530
12	1835	FLV-10-CS T145-13	8/24/87	77.11	12.62	0.57	0.05	0.08	0.34	0.07	2.78	6.37	99.99	0.8522
13	1452	126-1303 t115-14	1/28/86	77.67	12.53	0.89	0.04	0.08	0.39	0.11	2.44	5.84	99.99	0.8495
14	935	DR-46V		76.23	11.84	2.02	0.00	0.04	0.21	0.13	2.41	7.12	100.00	0.8489
15	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8468
16	2139	FL86C-5.41 B 1 sh		77.20	12.21	1.16	0.06	0.06	0.38	0.08	2.39	6.45	99.99	0.8459
17	1867	FLV-39-WW T147-13	9/30/87	77.61	12.59	0.53	0.06	0.09	0.35	0.10	2.77	5.92	100.02	0.8451
18	2213	KRL-880828-N DK GLS T181A-4	12/22/88	77.74	12.50	0.42	0.02	0.03	0.33	0.07	2.94	5.95	100.00	0.8427
19	1575	CHA 86 BT-3	8/18/86	77.75	12.39	0.64	0.02	0.09	0.29	0.06	3.53	5.23	100.00	0.8354
20	1837	FLV-12-CS T145-15	8/25/87	77.15	12.80	0.60	0.04	0.09	0.33	0.05	3.16	5.78	100.00	0.8343
21	822	GS-66		76.42	12.02	1.98	0.01	0.05	0.19	0.11	2.50	6.71	99.99	0.8342
22	870	LM-29		76.88	12.81	0.89	0.03	0.07	0.32	0.08	3.30	5.61	99.99	0.8337
23	1907	OT-2 T149-5	11/11/87	78.22	12.23	0.58	0.05	0.08	0.39	0.08	2.33	6.05	100.01	0.8323
24	1815	TTC-20 T144-6	7/21/87	77.70	12.58	0.58	0.05	0.06	0.31	0.05	3.38	5.29	100.00	0.8304
25	1921	86LP-38 T154-7	2/24/88	77.15	12.70	0.58	0.05	0.08	0.42	0.09	2.59	6.33	99.99	0.8302
26	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.8296
27	2358	FLV-120B-TC T196-8	8/7/89	77.74	12.72	0.72	0.05	0.07	0.33	0.12	3.22	5.03	100.00	0.8277
28	2357	FLV-120A-TC T196-7	8/7/89	77.90	12.70	0.72	0.05	0.08	0.34	0.09	3.11	5.02	100.01	0.8274
29	1520	JP 85 TPS-7 T120-2	4/29/86	76.33	12.86	0.78	0.06	0.07	0.40	0.11	2.78	6.61	100.00	0.8273
30	1816	TTC-21 T144-7	7/21/87	77.68	12.57	0.60	0.05	0.07	0.32	0.06	3.33	5.32	100.00	0.8260
31	1857	FLV-28-WW T147-4	9/30/87	77.46	12.55	0.53	0.06	0.08	0.39	0.09	2.17	6.67	100.00	0.8230
32	1780	QD-W6 T141-5	5/27/87	76.58	11.51	1.92	0.02	0.05	0.21	0.13	2.74	6.84	100.00	0.8226
33	1451	126-1265 t115-13	1/28/86	77.58	12.59	0.89	0.07	0.08	0.44	0.12	2.36	5.87	100.00	0.8221
34	1869	FLV-41-WW T147-15	9/30/87	77.68	12.65	0.55	0.04	0.11	0.31	0.09	3.58	4.99	100.00	0.8213
35	1872	FLV-44-WW T148-3	10/27/87	77.79	12.63	0.64	0.04	0.10	0.29	0.05	3.93	4.54	100.01	0.8210
36	1850	FLV-29-WW T146-13	8/25/87	76.85	12.65	0.55	0.06	0.08	0.41	0.06	2.20	7.13	99.99	0.8206
37	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8182
38	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8182
39	1873	FLV-45-WW T148-4	10/27/87	77.97	12.33	0.67	0.02	0.10	0.29	0.07	3.88	4.67	100.00	0.8181
40	1820	TTC-25 T144-11	7/21/87	77.93	12.47	0.56	0.03	0.06	0.31	0.06	3.58	4.99	99.99	0.8180
41	1664	PICO 163Q T132-5	10/21/86	76.93	13.52	0.60	0.04	0.10	0.32	0.07	3.86	4.56	100.00	0.8168
42	2203	FLV-128-TC T183-2	1/25/89	77.40	13.02	0.76	0.04	0.06	0.36	0.11	3.20	5.05	100.00	0.8166
43	994	RC-17		72.86	13.35	3.41	0.02	0.11	0.32	0.20	3.91	5.82	100.00	0.8149
44	405	W2A, T5-14		77.35	12.48	0.60	0.03	0.08	0.34	0.08	3.30	5.74	100.00	0.8145
45	1818	TTC-23 T144-9	7/21/87	77.58	12.62	0.71	0.03	0.03	0.32	0.03	3.58	5.10	100.00	0.8142
46	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.8133
47	2370	PR-80 T197-8	9/14/89	76.94	12.48	0.96	0.05	0.06	0.39	0.08	2.93	6.11	100.00	0.8130
48	1874	FLV-46-WW T148-5	10/27/87	77.91	12.40	0.68	0.02	0.08	0.30	0.07	3.84	4.69	99.99	0.8129
49	266	PICO-7(1), T39-8		76.83	12.88	0.76	0.03	0.05	0.31	0.05	3.94	5.14	99.99	0.8116
50	447	65W130, T31-3		76.64	12.49	1.45	0.00	0.06	0.28	0.06	4.49	4.52	99.99	0.8116

Listing of 50 closest matches for COMP. NO. 1898 for elements: Na, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total R	Sim Co
1	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	1.0000
2	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8766
3	1449	126-1176 t115-11	1/28/85	78.18	12.32	0.96	0.04	0.10	0.30	0.12	2.18	5.80	100.00	0.8578
4	1367	BO-107-1 T104-6	8/26/85	76.82	12.65	0.88	0.03	0.06	0.28	0.12	2.96	6.20	100.00	0.8570
5	1873	FLV-45-WW T148-4	10/27/87	77.97	12.33	0.67	0.02	0.10	0.29	0.07	3.88	4.67	100.00	0.8532
6	1872	FLV-44-WW T148-3	10/27/87	77.79	12.63	0.64	0.04	0.10	0.29	0.05	3.93	4.54	100.01	0.8525
7	1664	PICO 1630 T132-5	10/21/86	76.93	13.52	0.60	0.04	0.10	0.32	0.07	3.86	4.56	100.00	0.8500
8	1874	FLV-46-WW T148-5	10/27/87	77.91	12.40	0.68	0.02	0.08	0.30	0.07	3.84	4.69	99.99	0.8482
9	2357	FLV-120A-TC T196-7	8/7/89	77.90	12.70	0.72	0.05	0.08	0.34	0.09	3.11	5.02	100.01	0.8468
10	2358	FLV-120B-TC T196-8	8/7/89	77.74	12.72	0.72	0.05	0.07	0.33	0.12	3.22	5.03	100.00	0.8467
11	1575	CHA 86 BT-3	8/18/86	77.75	12.39	0.64	0.02	0.09	0.29	0.06	3.53	5.23	100.00	0.8457
12	447	65W130, T31-3		76.64	12.49	1.45	0.00	0.06	0.28	0.06	4.49	4.52	99.99	0.8441
13	2165	WCR-88-C (LO FE) T177-15	12/7/88	76.95	11.79	1.09	0.05	0.07	0.26	0.12	2.45	7.23	100.01	0.8441
14	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.8431
15	1869	FLV-41-WW T147-15	9/30/87	77.68	12.65	0.55	0.04	0.11	0.31	0.09	3.58	4.99	100.00	0.8430
16	1875	FLV-47-WW T148-6	10/27/87	77.99	12.30	0.72	0.03	0.07	0.31	0.04	3.82	4.71	99.99	0.8406
17	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.8404
18	1820	TTC-25 T144-11	7/21/87	77.93	12.47	0.56	0.03	0.06	0.31	0.06	3.58	4.99	99.99	0.8403
19	2161	WCR-88-A (LO FE) T177-13	12/7/88	75.83	12.80	1.22	0.05	0.10	0.30	0.10	2.24	7.38	100.02	0.8399
20	1815	TTC-20 T144-6	7/21/87	77.70	12.58	0.58	0.05	0.06	0.31	0.05	3.38	5.29	100.00	0.8398
21	1719	TTC-17 T138-12	4/23/87	77.76	12.71	0.55	0.05	0.10	0.33	0.07	3.74	4.69	100.00	0.8386
22	1452	126-1303 t115-14	1/28/86	77.67	12.53	0.89	0.04	0.08	0.39	0.11	2.44	5.84	99.99	0.8385
23	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.8380
24	1851	FLV-48-WW T146-14	8/25/87	77.41	12.76	0.71	0.04	0.06	0.32	0.06	3.81	4.83	100.00	0.8372
25	2203	FLV-128-TC T183-2	1/25/89	77.40	13.02	0.76	0.04	0.06	0.36	0.11	3.20	5.05	100.00	0.8371
26	1816	TTC-21 T144-7	7/21/87	77.68	12.57	0.60	0.05	0.07	0.32	0.06	3.33	5.32	100.00	0.8353
27	1833	FLV-8-CS T145-11	8/24/87	77.81	12.36	0.58	0.05	0.11	0.31	0.06	3.80	4.91	99.99	0.8344
28	1838	FLV-13-CS T146-1	88/25/87	77.48	12.82	0.60	0.04	0.08	0.33	0.04	3.85	4.75	99.99	0.8343
29	1768	TTC-6 T139-4	5/28/87	77.20	12.93	0.58	0.05	0.09	0.33	0.09	4.08	4.64	99.99	0.8337
30	15	BCF-1, T7-13, pd		77.17	13.12	0.75	0.15	0.04	0.37	0.19	3.59	4.63	100.01	0.8337
31	1818	TTC-23 T144-9	7/21/87	77.58	12.62	0.71	0.03	0.03	0.32	0.03	3.58	5.10	100.00	0.8333
32	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.8333
33	1712	TTC-9A T138-5	4/23/87	77.51	12.83	0.59	0.05	0.10	0.34	0.07	3.87	4.65	100.01	0.8329
34	1867	FLV-39-WW T147-13	9/30/87	77.61	12.59	0.53	0.06	0.09	0.35	0.10	2.77	5.92	100.02	0.8328
35	870	LM-29		76.88	12.81	0.89	0.03	0.07	0.32	0.08	3.30	5.61	99.99	0.8324
36	2088	CRAW-88-3G T173-2	10/6/88	77.54	12.82	0.67	0.02	0.06	0.32	0.06	4.02	4.49	100.00	0.8322
37	1834	FLV-9-CS T145-12	8/24/87	77.36	12.31	0.56	0.05	0.10	0.32	0.06	2.77	6.47	100.00	0.8319
38	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.8315
39	1871	FLV-43-WW T148-2	10/27/87	78.00	12.32	0.56	0.03	0.08	0.32	0.06	3.79	4.84	100.00	0.8309
40	1860	FLV-31-WW T147-4	10/30/87	77.47	12.02	2.01	0.02	0.05	0.35	0.15	3.42	4.51	100.00	0.8304
41	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.8302
42	2213	KRL-880828-N DK GLS T181A-4	12/22/88	77.74	12.50	0.42	0.02	0.03	0.33	0.07	2.94	5.95	100.00	0.8301
43	1836	FLV-11-CS T145-14	8/25/87	77.08	12.69	0.57	0.05	0.09	0.34	0.07	2.75	6.38	100.02	0.8300
44	1718	TTC-16 T138-11	4/23/87	77.76	12.62	0.59	0.04	0.11	0.34	0.06	3.73	4.76	100.01	0.8300
45	266	PICO-7(1), T39-8		76.83	12.88	0.76	0.03	0.05	0.31	0.05	3.94	5.14	99.99	0.8299
46	1710	TTC-8 T138-3	4/23/87	77.50	12.51	0.58	0.05	0.11	0.34	0.05	3.69	4.88	100.01	0.8295
47	446	65W129(2), T30-3		76.81	12.18	1.60	0.01	0.05	0.28	0.05	4.66	4.36	100.00	0.8292
48	1043	REW 7-28-83, T78-3	07/18/84	77.39	12.67	0.57	0.04	0.08	0.32	0.06	4.11	4.77	100.01	0.8292
49	1868	FLV-40-WW T147-14	9/30/87	77.97	12.55	0.55	0.04	0.10	0.34	0.09	3.78	4.57	99.99	0.8290
50	1817	TTC-22 T144-8	7/21/87	77.81	12.60	0.59	0.04	0.05	0.34	0.06	3.73	4.78	100.00	0.8288

Listing of 50 closest matches for COMP. NO. 1898 for elements: Na, Al, Si, K , Ca, Fe Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	1.0000
2	68	DSDP-1, T9-3, low total		75.79	14.88	0.11	0.49	0.01	0.96	0.01	2.43	5.32	100.00	0.8182
3	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8099
4	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.7728
5	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.7643
6	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.7581
7	1872	FLV-44-WW T148-3	10/27/87	77.79	12.63	0.64	0.04	0.10	0.29	0.05	3.93	4.54	100.01	0.7364
8	1664	PICO 163Q T132-5	10/21/86	76.93	13.52	0.60	0.04	0.10	0.32	0.07	3.86	4.56	100.00	0.7361
9	1873	FLV-45-WW T148-4	10/27/87	77.97	12.33	0.67	0.02	0.10	0.29	0.07	3.88	4.67	100.00	0.7359
10	1367	BO-107-1 T104-6	8/26/85	76.82	12.65	0.88	0.03	0.06	0.28	0.12	2.96	6.20	100.00	0.7331
11	1869	FLV-41-WW T147-15	9/30/87	77.68	12.65	0.55	0.04	0.11	0.31	0.09	3.58	4.99	100.00	0.7328
12	1449	126-1176 t115-11	1/28/85	78.18	12.32	0.96	0.04	0.10	0.30	0.12	2.18	5.80	100.00	0.7322
13	2213	KRL-880828-N DK GLS T181A-4	12/22/88	77.74	12.50	0.42	0.02	0.03	0.33	0.07	2.94	5.95	100.00	0.7314
14	1874	FLV-46-WW T148-5	10/27/87	77.91	12.40	0.68	0.02	0.08	0.30	0.07	3.84	4.69	99.99	0.7313
15	1575	CHA 86 BT-3	8/18/86	77.75	12.39	0.64	0.02	0.09	0.29	0.06	3.53	5.23	100.00	0.7308
16	1820	TTC-25 T144-11	7/21/87	77.93	12.47	0.56	0.03	0.06	0.31	0.06	3.58	4.99	99.99	0.7300
17	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.7292
18	1719	TTC-17 T138-12	4/23/87	77.76	12.71	0.55	0.05	0.10	0.33	0.07	3.74	4.69	100.00	0.7292
19	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.7291
20	2357	FLV-120A-TC T196-7	8/7/89	77.90	12.70	0.72	0.05	0.08	0.34	0.09	3.11	5.02	100.01	0.7288
21	2358	FLV-120B-TC T196-8	8/7/89	77.74	12.72	0.72	0.05	0.07	0.33	0.12	3.22	5.03	100.00	0.7287
22	1815	TTC-20 T144-6	7/21/87	77.70	12.58	0.58	0.05	0.06	0.31	0.05	3.38	5.29	100.00	0.7285
23	1867	FLV-39-WW T147-13	9/30/87	77.61	12.59	0.53	0.06	0.09	0.35	0.10	2.77	5.92	100.02	0.7255
24	1833	FLV-8-CS T145-11	8/24/87	77.81	12.36	0.58	0.05	0.11	0.31	0.06	3.80	4.91	99.99	0.7241
25	1816	TTC-21 T144-7	7/21/87	77.68	12.57	0.60	0.05	0.07	0.32	0.06	3.33	5.32	100.00	0.7238
26	1875	FLV-47-WW T148-6	10/27/87	77.99	12.30	0.72	0.03	0.07	0.31	0.04	3.82	4.71	99.99	0.7237
27	1768	TTC-6 T139-4	5/28/87	77.20	12.93	0.58	0.05	0.09	0.33	0.09	4.08	4.64	99.99	0.7235
28	1838	FLV-13-CS T146-1	88/25/87	77.48	12.82	0.60	0.04	0.08	0.33	0.04	3.85	4.75	99.99	0.7231
29	1834	FLV-9-CS T145-12	8/24/87	77.36	12.31	0.56	0.05	0.10	0.32	0.06	2.77	6.47	100.00	0.7230
30	1712	TTC-9A T138-5	4/23/87	77.51	12.83	0.59	0.05	0.10	0.34	0.07	3.87	4.65	100.01	0.7224
31	1871	FLV-43-WW T148-2	10/27/87	78.00	12.32	0.56	0.03	0.08	0.32	0.06	3.79	4.84	100.00	0.7222
32	1851	FLV-48-WW T146-14	8/25/87	77.41	12.76	0.71	0.04	0.06	0.32	0.06	3.81	4.83	100.00	0.7212
33	1868	FLV-40-WW T147-14	9/30/87	77.97	12.55	0.55	0.04	0.10	0.34	0.09	3.78	4.57	99.99	0.7211
34	1836	FLV-11-CS T145-14	8/25/87	77.08	12.69	0.57	0.05	0.09	0.34	0.07	2.75	6.38	100.02	0.7209
35	1043	REW 7-28-83, T78-3	07/18/84	77.39	12.67	0.57	0.04	0.08	0.32	0.06	4.11	4.77	100.01	0.7202
36	1710	TTC-8 T138-3	4/23/87	77.50	12.81	0.58	0.05	0.11	0.34	0.05	3.69	4.88	100.01	0.7200
37	1718	TTC-16 T138-11	4/23/87	77.76	12.62	0.59	0.04	0.11	0.34	0.06	3.73	4.76	100.01	0.7199
38	2203	FLV-128-TC T183-2	1/25/89	77.40	13.02	0.76	0.04	0.06	0.36	0.11	3.20	5.05	100.00	0.7195
39	1672	84 NV 14-2	10/21/86	77.72	12.49	0.58	0.05	0.10	0.33	0.07	4.03	4.63	100.00	0.7191
40	1817	TTC-22 T144-8	7/21/87	77.81	12.60	0.59	0.04	0.05	0.34	0.06	3.73	4.78	100.00	0.7190
41	1835	FLV-10-CS T145-13	8/24/87	77.11	12.62	0.57	0.05	0.08	0.34	0.07	2.78	6.37	99.99	0.7188
42	2165	WCR-88-C (LO FE) T177-15	12/7/88	76.95	11.79	1.09	0.05	0.07	0.26	0.12	2.45	7.23	100.01	0.7187
43	2088	CRAW-88-3G T173-2	10/6/88	77.54	12.82	0.67	0.02	0.06	0.32	0.06	4.02	4.49	100.00	0.7184
44	1711	TTC-9 T138-4	4/23/87	77.64	12.65	0.58	0.04	0.10	0.34	0.07	3.69	4.88	99.99	0.7182
45	1818	TTC-23 T144-9	7/21/87	77.58	12.62	0.71	0.03	0.03	0.32	0.03	3.58	5.10	100.00	0.7179
46	1837	FLV-12-CS T145-15	8/25/87	77.15	12.80	0.60	0.04	0.09	0.33	0.05	3.16	5.78	100.00	0.7178
47	1452	126-1303 t115-14	1/28/86	77.67	12.53	0.89	0.04	0.08	0.39	0.11	2.44	5.84	99.99	0.7175
48	15	BCF-1, T7-13, pd		77.17	13.12	0.75	0.15	0.04	0.37	0.19	3.59	4.63	100.01	0.7170
49	1813	TTC-19 (1) T144-5	7/21/87	77.41	12.61	0.59	0.05	0.07	0.32	0.06	3.85	5.04	100.00	0.7167
50	1592	P-169Q T130-1	9/19/86	77.59	12.55	0.58	0.04	0.10	0.33	0.06	3.87	4.87	99.99	0.7166

Listing of 50 closest matches for COMP. NO. 1898 for elements: Na, Mg, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	1.0000
2	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8697
3	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.8356
4	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.8183
5	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.7879
6	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.7693
7	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.7693
8	68	DSDP-1, T9-3, low total		75.79	14.88	0.11	0.49	0.01	0.96	0.01	2.43	5.32	100.00	0.7628
9	15	BCF-1, T7-13, pd		77.17	13.12	0.75	0.15	0.04	0.37	0.19	3.59	4.63	100.01	0.7242
10	1449	126-1176 t115-11	1/28/85	78.18	12.32	0.96	0.04	0.10	0.30	0.12	2.18	5.80	100.00	0.7227
11	1367	BO-107-1 T104-6	8/26/85	76.82	12.65	0.88	0.03	0.06	0.28	0.12	2.96	6.20	100.00	0.7201
12	1872	FLV-44-WW T148-3	10/27/87	77.79	12.63	0.64	0.04	0.10	0.29	0.05	3.93	4.54	100.01	0.7182
13	1664	PICO 163Q T132-5	10/21/86	76.93	13.52	0.60	0.04	0.10	0.32	0.07	3.86	4.56	100.00	0.7162
14	2357	FLV-120A-TC T196-7	8/7/89	77.90	12.70	0.72	0.05	0.08	0.34	0.09	3.11	5.02	100.01	0.7155
15	2358	FLV-120B-TC T196-8	8/7/89	77.74	12.72	0.72	0.05	0.07	0.33	0.12	3.22	5.03	100.00	0.7153
16	1873	FLV-45-WW T148-4	10/27/87	77.97	12.33	0.67	0.02	0.10	0.29	0.07	3.88	4.67	100.00	0.7149
17	2165	WCR-88-C (LO FE) T177-15	12/7/88	76.95	11.79	1.09	0.05	0.07	0.26	0.12	2.45	7.23	100.01	0.7132
18	653	6R008A, T66-1	10/25/83	69.98	15.75	2.74	0.77	0.05	2.82	0.52	3.82	3.54	99.99	0.7114
19	1874	FLV-46-WW T148-5	10/27/87	77.91	12.40	0.68	0.02	0.08	0.30	0.07	3.84	4.69	99.99	0.7107
20	1869	FLV-41-WW T147-15	9/30/87	77.68	12.65	0.55	0.04	0.11	0.31	0.09	3.58	4.99	100.00	0.7104
21	2161	WCR-88-A (LO FE) T177-13	12/7/88	75.83	12.80	1.22	0.05	0.10	0.30	0.10	2.24	7.38	100.02	0.7098
22	1815	TTC-20 T144-6	7/21/87	77.70	12.58	0.58	0.05	0.06	0.31	0.05	3.38	5.29	100.00	0.7096
23	1575	CHA 86 BT-3	8/18/86	77.75	12.39	0.64	0.02	0.09	0.29	0.06	3.53	5.23	100.00	0.7087
24	1719	TTC-17 T138-12	4/23/87	77.76	12.71	0.55	0.05	0.10	0.33	0.07	3.74	4.69	100.00	0.7087
25	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.7081
26	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.7081
27	1452	126-1303 t115-14	1/28/86	77.67	12.53	0.89	0.04	0.08	0.39	0.11	2.44	5.84	99.99	0.7066
28	1875	FLV-47-WW T148-6	10/27/87	77.99	12.30	0.72	0.03	0.07	0.31	0.04	3.82	4.71	99.99	0.7064
29	1820	TTC-25 T144-11	7/21/87	77.93	12.47	0.56	0.03	0.06	0.31	0.06	3.58	4.99	99.99	0.7062
30	1816	TTC-21 T144-7	7/21/87	77.68	12.57	0.60	0.05	0.07	0.32	0.06	3.33	5.32	100.00	0.7058
31	1867	FLV-39-WW T147-13	9/30/87	77.61	12.59	0.53	0.06	0.09	0.35	0.10	2.77	5.92	100.02	0.7058
32	1851	FLV-48-WW T146-14	8/25/87	77.41	12.76	0.71	0.04	0.06	0.32	0.06	3.81	4.83	100.00	0.7055
33	2203	FLV-128-TC T183-2	1/25/89	77.40	13.02	0.76	0.04	0.06	0.36	0.11	3.20	5.05	100.00	0.7054
34	1833	FLV-8-CS T145-11	8/24/87	77.81	12.36	0.58	0.05	0.11	0.31	0.06	3.80	4.91	99.99	0.7052
35	1768	TTC-6 T139-4	5/28/87	77.20	12.93	0.58	0.05	0.09	0.33	0.09	4.08	4.64	99.99	0.7046
36	1712	TTC-9A T138-5	4/23/87	77.51	12.83	0.59	0.05	0.10	0.34	0.07	3.87	4.65	100.01	0.7039
37	447	65W130, T31-3		76.64	12.49	1.45	0.00	0.06	0.28	0.06	4.49	4.52	99.99	0.7035
38	1838	FLV-13-CS T146-1	88/25/87	77.48	12.82	0.60	0.04	0.08	0.33	0.04	3.85	4.75	99.99	0.7031
39	1834	FLV-9-CS T145-12	8/24/87	77.36	12.31	0.56	0.05	0.10	0.32	0.06	2.77	6.47	100.00	0.7030
40	824	GS-70		70.64	14.97	3.96	0.83	0.05	2.40	0.81	3.52	2.81	99.99	0.7029
41	1836	FLV-11-CS T145-14	8/25/87	77.08	12.69	0.57	0.05	0.09	0.34	0.07	2.75	6.38	100.02	0.7015
42	86	DSDP-19, T10-3		67.58	16.11	2.88	0.69	0.10	1.74	0.78	4.85	5.26	99.99	0.7012
43	1710	TTC-8 T138-3	4/23/87	77.50	12.81	0.58	0.05	0.11	0.34	0.05	3.69	4.88	100.01	0.7011
44	932	DR-42		76.15	12.32	1.37	0.07	0.10	0.33	0.24	2.81	6.61	100.00	0.7006
45	2262	T189-1 912-M	5/9/89	72.22	14.03	2.75	0.54	0.03	1.64	0.54	3.79	4.46	100.00	0.7005
46	1818	TTC-23 T144-9	7/21/87	77.58	12.62	0.71	0.03	0.03	0.32	0.03	3.58	5.10	100.00	0.7003
47	1672	84 NV 14-2	10/21/86	77.72	12.49	0.58	0.05	0.10	0.33	0.07	4.03	4.63	100.00	0.7001
48	1718	TTC-16 T138-11	4/23/87	77.76	12.62	0.59	0.04	0.11	0.34	0.06	3.73	4.76	100.01	0.6995
49	870	LM-29		76.88	12.81	0.89	0.03	0.07	0.32	0.08	3.30	5.61	99.99	0.6995
50	1026	KRL-71082N-3 (591) T58-2	6/22/84	67.94	16.62	2.48	0.77	0.00	2.90	0.48	4.99	3.81	99.99	0.6994

II. Listing of 50 closest matches for COMP. NO. 1903 for elements: Na, Al, Si, Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	1.0000
2	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.9389
3	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9210
4	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.9128
5	129	GV-78-23, T16-2		75.69	12.92	1.84	0.01	0.05	0.47	0.14	1.79	7.09	100.00	0.9112
6	2073	CCP-C T172-2	9/28/88	77.06	12.19	1.53	0.05	0.02	0.50	0.14	2.09	6.42	100.00	0.9055
7	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.8923
8	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.8884
9	1850	FLV-29-WW T146-13	8/25/87	76.85	12.65	0.55	0.06	0.08	0.41	0.06	2.20	7.13	99.99	0.8839
10	984	RC-2		77.41	12.72	0.58	0.06	0.05	0.57	0.10	2.10	6.41	100.00	0.8823
11	1451	126-1265 t115-13	1/28/86	77.58	12.59	0.89	0.07	0.08	0.44	0.12	2.36	5.87	100.00	0.8809
12	131	GV-78-29, T16-4		76.22	13.26	0.85	0.03	0.00	0.48	0.09	2.70	6.37	100.00	0.8788
13	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.8788
14	1353	BE-256 T106-15	8/30/85	77.82	12.13	0.85	0.08	0.07	0.47	0.14	1.66	6.78	100.00	0.8766
15	985	RC-3		77.17	12.94	0.63	0.07	0.05	0.60	0.11	2.11	6.32	100.00	0.8749
16	1509	BE-249 T119-8	4/28/86	77.00	12.75	0.57	0.07	0.07	0.53	0.08	1.77	7.16	100.00	0.8736
17	1857	FLV-28-WW T147-4	9/30/87	77.46	12.55	0.53	0.06	0.08	0.39	0.09	2.17	6.67	100.00	0.8731
18	2367	PR-77 T197-5	9/14/89	76.95	12.59	0.87	0.04	0.07	0.47	0.09	2.71	6.20	99.99	0.8710
19	2276	T191-6 FLV-77-HT	5/10/89	76.97	12.56	0.73	0.05	0.04	0.46	0.11	2.64	6.44	100.00	0.8701
20	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.8693
21	2141	HPDA-11.06 A 2 sh		76.10	12.95	1.15	0.05	0.03	0.47	0.13	2.87	6.24	99.99	0.8686
22	1344	BE-15-A1 T106-6	8/29/85	77.12	12.52	0.82	0.06	0.07	0.48	0.14	2.68	6.11	100.00	0.8663
23	1343	BE-62 T106-5	8/29/85	77.36	12.59	0.58	0.05	0.06	0.40	0.11	1.81	7.04	100.00	0.8661
24	1928	87-34-SUJ T158-14	3/16/88	76.23	12.44	2.37	0.01	0.06	0.64	0.17	2.08	5.99	99.99	0.8616
25	122	GV-77-30A, T19-15		77.31	13.00	0.91	0.05	0.03	0.65	0.06	2.10	5.88	99.99	0.8614
26	1331	BE-222 T105-8	8/29/85	76.93	12.37	0.86	0.13	0.07	0.64	0.14	2.06	6.79	99.99	0.8607
27	1497	AMAR-1 T80-1	7/20/84	76.72	12.93	0.77	0.06	0.07	0.49	0.08	2.80	6.08	100.00	0.8605
28	2145	HPDA-11.06 intFehiK 9sh		76.72	11.89	1.71	0.09	0.04	0.57	0.17	2.21	6.61	100.01	0.8600
29	119	GV-77-2, T16-14		76.02	12.46	1.94	0.04	0.00	0.65	0.22	2.00	6.66	99.99	0.8597
30	2356	FLV-110-WW T196-4	8/7/89	77.16	12.22	1.28	0.08	0.03	0.48	0.18	2.74	5.84	100.01	0.8575
31	2204	M86TH-106 T183-3	1/25/89	76.64	11.96	1.79	0.07	0.02	0.56	0.25	2.30	6.39	99.98	0.8559
32	2199	FLV-115-WW T182-6	1/24/89	77.09	12.37	1.27	0.08	0.01	0.47	0.19	2.89	5.63	100.00	0.8555
33	2197	FLV-111B-WW T182-4	1/24/89	76.75	12.95	0.80	0.02	0.02	0.47	0.07	3.06	5.85	99.99	0.8555
34	1927	86LP39, T157-1	03/14/88	76.57	12.90	0.57	0.04	0.08	0.56	0.07	2.47	6.75	100.01	0.8549
35	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8547
36	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8547
37	1921	86LP-38 T154-7	2/24/88	77.15	12.70	0.58	0.05	0.08	0.42	0.09	2.59	6.33	99.99	0.8541
38	2230	FLV-111-WW T185-3	2/28/89	76.95	12.50	0.82	0.02	0.08	0.46	0.06	2.87	6.23	99.99	0.8538
39	118	GV-76-20, T16-13		77.48	12.87	0.61	0.05	0.02	0.67	0.13	1.98	6.19	100.00	0.8533
40	2120	N-6 T175-10	10/28/88	77.13	13.06	0.92	0.05	0.07	0.52	0.09	2.76	5.39	99.99	0.8500
41	1907	OT-2 T149-5	11/11/87	78.22	12.23	0.58	0.05	0.08	0.39	0.08	2.33	6.05	100.01	0.8498
42	114	GV-76-6, T16-11		77.28	12.92	0.73	0.05	0.10	0.44	0.11	2.86	5.50	99.99	0.8490
43	1435	DI-85-AN T114-3	12/12/85	76.10	13.08	1.29	0.03	0.04	0.67	0.08	2.21	6.50	100.00	0.8490
44	2231	FLV-112-WW LIGHT T185-4	2/28/89	76.98	12.66	0.80	0.03	0.07	0.46	0.06	2.99	5.96	100.01	0.8490
45	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	0.8468
46	1452	126-1303 t115-14	1/28/86	77.67	12.53	0.89	0.04	0.08	0.39	0.11	2.44	5.84	99.99	0.8461
47	691	RS-7-6		76.92	11.80	1.45	0.05	0.00	0.58	0.20	1.80	7.20	100.00	0.8442
48	130	GV-78-27, T16-3		76.55	13.38	1.26	0.04	0.00	0.56	0.11	2.72	5.38	100.00	0.8432
49	851	LM-4		76.91	12.63	1.19	0.02	0.03	0.49	0.10	3.01	5.62	100.00	0.8427
50	2200	FLV-116-WW T182-7	1/24/89	76.89	12.40	1.31	0.09	0.02	0.49	0.21	2.96	5.63	100.00	0.8422

Listing of 50 closest matches for COMP. NO. 1903 for elements: Na, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	1.0000
2	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.9053
3	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.9022
4	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.8973
5	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.8909
6	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.8775
7	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	0.8766
8	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.8715
9	2073	CCP-C T172-2	9/28/88	77.06	12.19	1.53	0.05	0.02	0.50	0.14	2.09	6.42	100.00	0.8695
10	1451	126-1265 t115-13	1/28/86	77.58	12.59	0.89	0.07	0.08	0.44	0.12	2.36	5.87	100.00	0.8635
11	129	GV-78-23, T16-2		75.69	12.92	1.84	0.01	0.05	0.47	0.14	1.79	7.09	100.00	0.8604
12	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.8595
13	104	FRIANT-2, T18-6		77.53	12.86	0.68	0.03	0.03	0.47	0.06	3.40	4.94	100.00	0.8567
14	2224	FPUP-1 T184-4	2/28/89	76.57	12.72	1.65	0.02	0.05	0.47	0.14	3.36	5.01	99.99	0.8562
15	270	PICO-21, T2-8		77.06	13.00	0.79	0.03	0.04	0.47	0.05	3.88	4.67	99.99	0.8556
16	2225	FBP2-1 T184-5	2/28/89	76.64	12.65	1.66	0.03	0.05	0.47	0.14	3.35	5.02	100.01	0.8552
17	2078	CRAW-88-1A T172-7	9/28/88	77.72	12.63	0.70	0.03	0.04	0.47	0.04	3.71	4.65	99.99	0.8543
18	452	81BO51, T35-5		76.52	12.77	0.74	0.04	0.02	0.46	0.07	3.67	4.72	99.01	0.8539
19	2080	CRAW-88-2D2 T172-9	9/28/88	77.61	12.69	0.70	0.03	0.04	0.47	0.08	3.64	4.76	100.02	0.8537
20	1890	JT-NOVA-1600 T150-7	11/9/87	77.18	12.98	0.81	0.04	0.08	0.48	0.06	3.42	4.96	100.01	0.8534
21	1889	JT-NOVA-1 T150-6	11/9/87	77.01	13.15	0.75	0.04	0.08	0.48	0.05	3.31	5.14	100.01	0.8532
22	2120	N-6 T175-10	10/28/88	77.13	13.06	0.92	0.05	0.07	0.52	0.09	2.76	5.39	99.99	0.8529
23	2221	KRL-880828-N T181B-7	1/23/89	77.35	12.96	0.71	0.03	0.03	0.46	0.07	3.48	4.90	99.99	0.8528
24	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.8523
25	1433	ASW 62285-2 (2) T114-1	12/12/85	77.78	12.55	0.78	0.04	0.06	0.46	0.08	3.40	4.85	100.00	0.8516
26	2220	KRL-880828-Q T181B-6	1/23/89	77.26	12.97	0.72	0.03	0.03	0.48	0.07	3.53	4.91	100.00	0.8512
27	984	RC-2		77.41	12.72	0.58	0.06	0.05	0.57	0.10	2.10	6.41	100.00	0.8512
28	381	TECO-26, T18-11		77.61	12.73	0.72	0.03	0.03	0.48	0.06	3.70	4.63	99.99	0.8511
29	2223	FPB-1 T184-3	2/28/89	76.61	12.71	1.62	0.03	0.05	0.46	0.12	3.32	5.07	99.99	0.8510
30	439	9-153, T45-6		76.68	12.45	1.63	0.07	0.02	0.47	0.18	3.79	4.71	100.00	0.8508
31	2199	FLV-115-WW T182-6	1/24/89	77.09	12.37	1.27	0.08	0.01	0.47	0.19	2.89	5.63	100.00	0.8500
32	103	FRIANT-1, T18-5		77.54	12.73	0.73	0.03	0.03	0.48	0.06	3.56	4.83	99.99	0.8498
33	2081	CRAW-88-2D3 T172-10	10/5/88	77.66	12.62	0.76	0.03	0.04	0.46	0.05	3.70	4.69	100.01	0.8495
34	131	GV-78-29, T16-4		76.22	13.26	0.85	0.03	0.00	0.48	0.09	2.70	6.37	100.00	0.8494
35	623	TULELAKE-296(200-325), T62-5	08/25/83	76.54	13.06	1.06	0.06	0.05	0.48	0.09	3.93	4.74	100.01	0.8492
36	1206	TULEFLAKE 2038 LAP (53.67M) T9	3/1/85	76.40	13.00	1.25	0.03	0.06	0.46	0.07	4.06	4.66	99.99	0.8488
37	1357	29068503 T107-3	8/30/85	78.16	12.18	0.67	0.05	0.04	0.47	0.09	3.61	4.72	99.99	0.8488
38	114	GV-76-6, T16-11		77.28	12.92	0.73	0.05	0.10	0.44	0.11	2.86	5.50	99.99	0.8487
39	1885	JT-6387-1 T150-3	11/9/97	77.34	12.89	0.76	0.03	0.07	0.46	0.06	3.81	4.59	100.01	0.8487
40	1886	JT-41186-1 T150-4	9/11/87	77.34	12.89	0.76	0.03	0.07	0.46	0.06	3.81	4.59	100.01	0.8487
41	20	BHA-I, T18-10		77.56	12.72	0.76	0.03	0.03	0.47	0.05	3.83	4.56	100.01	0.8485
42	1827	FLV-2-CS T145-5	8/24/87	77.61	12.81	0.72	0.05	0.09	0.47	0.06	3.73	4.47	100.01	0.8484
43	1828	FLV-3-CS T145-6	8/24/87	77.68	12.69	0.73	0.05	0.09	0.48	0.05	3.68	4.56	100.01	0.8480
44	2049	CAES#1 857 T171-3	9/5/88	77.75	12.54	0.72	0.03	0.07	0.46	0.04	3.63	4.75	99.99	0.8480
45	130	GV-78-27, T16-3		76.55	13.38	1.26	0.04	0.00	0.56	0.11	2.72	5.38	100.00	0.8478
46	122	GV-77-30A, T19-15		77.31	13.00	0.91	0.05	0.03	0.65	0.06	2.10	5.88	99.99	0.8476
47	985	RC-3		77.17	12.94	0.63	0.07	0.05	0.60	0.11	2.11	6.32	100.00	0.8474
48	668	CAPIS-1, T54-1	xx/xx/xx	78.43	12.27	1.29	0.08	0.04	0.48	0.18	3.05	4.17	99.99	0.8473
49	2367	PR-77 T197-5	9/14/89	76.95	12.59	0.87	0.04	0.07	0.47	0.09	2.71	6.20	99.99	0.8471
50	264	PICO-5(1), T2-7		77.30	12.93	0.77	0.03	0.04	0.48	0.06	3.83	4.55	99.99	0.8471

Listing of 50 closest matches for COMP. NO. 1903 for elements: Na, Al, Si, K , Ca, Fe Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	1.0000
2	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.8946
3	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.8834
4	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.8685
5	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.8192
6	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	0.8099
7	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.8024
8	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.7801
9	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.7743
10	984	RC-2		77.41	12.72	0.58	0.06	0.05	0.57	0.10	2.10	6.41	100.00	0.7697
11	68	DSDP-1, T9-3, low total		75.79	14.88	0.11	0.49	0.01	0.96	0.01	2.43	5.32	100.00	0.7687
12	104	FRIANT-2, T18-6		77.53	12.86	0.68	0.03	0.03	0.47	0.06	3.40	4.94	100.00	0.7654
13	1857	FLV-28-WW T147-4	9/30/87	77.46	12.55	0.53	0.06	0.08	0.39	0.09	2.17	6.67	100.00	0.7645
14	1864	FLV-35-WW T147-9	9/30/87	77.58	12.69	0.60	0.06	0.07	0.49	0.10	3.76	4.65	100.00	0.7631
15	2078	CRAW-88-1A T172-7	9/28/88	77.72	12.63	0.70	0.03	0.04	0.47	0.04	3.71	4.65	99.99	0.7619
16	1850	FLV-29-WW T146-13	8/25/87	76.85	12.65	0.55	0.06	0.08	0.41	0.06	2.20	7.13	99.99	0.7618
17	985	RC-3		77.17	12.94	0.63	0.07	0.05	0.60	0.11	2.11	6.32	100.00	0.7617
18	2080	CRAW-88-2D2 T172-9	9/28/88	77.61	12.69	0.70	0.03	0.04	0.47	0.08	3.64	4.76	100.02	0.7614
19	1671	84 NV 14-1	10/21/86	77.45	12.68	0.58	0.05	0.06	0.46	0.07	3.75	4.89	99.99	0.7613
20	1989	WL-5-22 (85.15m) T165-2	5/22/88	77.93	12.32	0.60	0.05	0.06	0.46	0.11	3.77	4.71	100.01	0.7603
21	2001	WL-5-12 (61.28M) lo Ca fract.	5/22/88	77.54	12.80	0.61	0.01	0.06	0.45	0.05	3.85	4.63	100.00	0.7602
22	1252	TLN-4 T96-11	5/29/85	77.26	12.83	0.58	0.04	0.08	0.45	0.08	3.95	4.74	100.01	0.7601
23	2221	KRL-880828-N T181B-7	1/23/89	77.35	12.96	0.71	0.03	0.03	0.46	0.07	3.48	4.90	99.99	0.7600
24	1357	29068503 T107-3	8/30/85	78.16	12.18	0.67	0.05	0.04	0.47	0.09	3.61	4.72	99.99	0.7595
25	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.7592
26	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.7592
27	1451	126-1265 t115-13	1/28/86	77.58	12.59	0.89	0.07	0.08	0.44	0.12	2.36	5.87	100.00	0.7589
28	452	81B051, T35-5		76.52	12.77	0.74	0.04	0.02	0.46	0.07	3.67	4.72	99.01	0.7588
29	1865	FLV-36-WW T147-10	9/30/87	77.47	12.83	0.58	0.05	0.09	0.43	0.11	3.66	4.76	99.98	0.7587
30	1595	MOD-9 T130-5	9/19/86	78.25	12.13	0.67	0.03	0.06	0.47	0.06	3.41	4.91	99.99	0.7580
31	2220	KRL-880828-Q T181B-6	1/23/89	77.26	12.97	0.72	0.03	0.03	0.48	0.07	3.53	4.91	100.00	0.7580
32	381	TECO-26, T18-11		77.61	12.73	0.72	0.03	0.03	0.48	0.06	3.70	4.63	99.99	0.7578
33	1251	TLN-3 T96-10	5/29/85	77.20	12.87	0.54	0.04	0.09	0.43	0.09	4.03	4.70	99.99	0.7577
34	1889	JT-NOVA-1 T150-6	11/9/87	77.01	13.15	0.75	0.04	0.08	0.48	0.05	3.31	5.14	100.01	0.7577
35	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.7575
36	270	PICO-21, T2-8		77.06	13.00	0.79	0.03	0.04	0.47	0.05	3.88	4.67	99.99	0.7573
37	1249	TLN-1 T96-8	5/29/85	77.28	12.76	0.56	0.04	0.08	0.44	0.08	4.09	4.69	100.02	0.7568
38	128	GV-78-22, T16-1		77.07	12.94	0.67	0.05	0.06	0.48	0.10	3.22	5.41	100.00	0.7563
39	103	FRIANT-1, T18-5		77.54	12.73	0.73	0.03	0.03	0.48	0.06	3.56	4.83	99.99	0.7561
40	1827	FLV-2-CS T145-5	8/24/87	77.61	12.81	0.72	0.05	0.09	0.47	0.06	3.73	4.47	100.01	0.7556
41	1441	0808502 SILICIC FR.	12/12/85	77.58	12.68	0.67	0.05	0.08	0.45	0.10	3.28	5.11	100.00	0.7556
42	2049	CAES#1 857 T171-3	9/5/88	77.75	12.54	0.72	0.03	0.07	0.46	0.04	3.63	4.75	99.99	0.7553
43	1907	OT-2 T149-5	11/11/87	78.22	12.23	0.58	0.05	0.08	0.39	0.08	2.33	6.05	100.01	0.7552
44	114	GV-76-6, T16-11		77.28	12.92	0.73	0.05	0.10	0.44	0.11	2.86	5.50	99.99	0.7552
45	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.7547
46	1828	FLV-3-CS T145-6	8/24/87	77.68	12.69	0.73	0.05	0.09	0.48	0.05	3.68	4.56	100.01	0.7546
47	1433	ASW 62285-2 (2) T114-1	12/12/85	77.78	12.55	0.78	0.04	0.06	0.46	0.08	3.40	4.85	100.00	0.7545
48	1683	MRSN-1 T134-4	11/25/86	77.63	12.49	0.61	0.07	0.07	0.49	0.09	3.21	5.35	100.01	0.7544
49	1890	JT-NOVA-1600 T150-7	11/9/87	77.18	12.98	0.81	0.04	0.08	0.48	0.06	3.42	4.96	100.01	0.7543
50	2081	CRAW-88-2D3 T172-10	10/5/88	77.66	12.62	0.76	0.03	0.04	0.46	0.05	3.70	4.69	100.01	0.7540

Listing of 50 closest matches for COMP. NO. 1903 for elements: Na, Mg, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	1.0000
2	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9044
3	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.8903
4	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	0.8697
5	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.8463
6	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8152
7	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8152
8	68	DSDP-1, T9-3, low total		75.79	14.88	0.11	0.49	0.01	0.96	0.01	2.43	5.32	100.00	0.7964
9	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.7661
10	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.7642
11	2133	CCPC-5.36 C lo Na lsh		77.67	13.78	1.54	0.21	0.09	0.61	0.20	1.36	4.53	99.99	0.7497
12	1338	BE-91 T105-15	8/29/85	68.46	16.75	2.96	0.53	0.08	1.61	0.55	1.83	7.24	100.01	0.7477
13	2073	CCP-C T172-2	9/28/88	77.06	12.19	1.53	0.05	0.02	0.50	0.14	2.09	6.42	100.00	0.7364
14	1451	126-1265 t115-13	1/28/86	77.58	12.59	0.89	0.07	0.08	0.44	0.12	2.36	5.87	100.00	0.7360
15	86	DSDP-19, T10-3		67.58	16.11	2.88	0.69	0.10	1.74	0.78	4.85	5.26	99.99	0.7353
16	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.7350
17	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.7333
18	2229	FLV-76-WW T185-2	2/28/89	77.93	12.16	0.86	0.11	0.02	0.46	0.18	3.20	5.09	100.01	0.7300
19	2199	FLV-115-WW T182-6	1/24/89	77.09	12.37	1.27	0.08	0.01	0.47	0.19	2.89	5.63	100.00	0.7271
20	1926	1-JWB-1-CM-3 T154-2	2/24/88	72.87	14.90	1.29	0.12	0.12	0.48	0.20	5.10	4.92	100.00	0.7261
21	751	HC-11		77.33	12.22	1.32	0.09	0.04	0.49	0.20	2.90	5.41	100.00	0.7258
22	439	9-153, T45-6		76.68	12.45	1.63	0.07	0.02	0.47	0.18	3.79	4.71	100.00	0.7254
23	2321	NAP-1L T193-2	6/1/89	78.32	12.39	0.73	0.10	0.05	0.53	0.09	3.20	4.59	100.00	0.7254
24	668	CAPIS-1, T54-1	xx/xx/xx	78.43	12.27	1.29	0.08	0.04	0.48	0.18	3.05	4.17	99.99	0.7248
25	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.7245
26	673	TULELAKE-715 (wh pum), T59-A1	xx/xx/xx	70.87	15.50	2.67	0.68	0.06	1.99	0.42	4.14	3.68	100.01	0.7245
27	1618	MOD-8 T130-4 LO FE FR.	9/19/86	70.17	15.09	2.84	0.55	0.05	1.62	0.54	4.37	4.78	100.01	0.7239
28	2262	T189-1 912-M	5/9/89	72.22	14.03	2.75	0.54	0.03	1.64	0.54	3.79	4.46	100.00	0.7238
29	1908	OT-3 T149-6	11/11/87	77.97	12.29	0.94	0.15	0.06	0.71	0.17	2.21	5.51	100.01	0.7237
30	2356	FLV-110-WW T196-4	8/7/89	77.16	12.22	1.28	0.08	0.03	0.48	0.18	2.74	5.84	100.01	0.7234
31	984	RC-2		77.41	12.72	0.58	0.06	0.05	0.57	0.10	2.10	6.41	100.00	0.7234
32	985	RC-3		77.17	12.94	0.63	0.07	0.05	0.60	0.11	2.11	6.32	100.00	0.7226
33	1428	ASW-6985-3 T103-3	08/26/85	70.60	15.08	2.68	0.69	0.07	2.17	0.42	4.38	3.91	100.00	0.7225
34	2120	N-6 T175-10	10/28/88	77.13	13.06	0.92	0.05	0.07	0.52	0.09	2.76	5.39	99.99	0.7225
35	2114	JI-SM-62888-1 T175-3	10/27/88	77.20	12.17	1.90	0.10	0.03	0.69	0.30	2.13	5.49	100.01	0.7219
36	623	TULELAKE-296(200-325), T62-5	08/25/83	76.54	13.06	1.06	0.06	0.05	0.48	0.09	3.93	4.74	100.01	0.7217
37	17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.7217
38	452	81B051, T35-5		76.52	12.77	0.74	0.04	0.02	0.46	0.07	3.67	4.72	99.01	0.7209
39	104	FRIANT-2, T18-6		77.53	12.86	0.68	0.03	0.03	0.47	0.06	3.40	4.94	100.00	0.7209
40	1840	FLV-16-WW T146-4	8/25/87	77.22	12.84	0.75	0.07	0.05	0.49	0.10	3.09	5.39	100.00	0.7209
41	7	ASH CREEK-1, T28-1		75.93	14.35	0.63	0.12	0.10	0.54	0.05	3.98	4.30	100.00	0.7207
42	1925	1-JWB-1-CM-2 T154-1	2/.24/88	72.82	14.97	1.30	0.12	0.11	0.50	0.20	5.06	4.92	100.00	0.7207
43	2200	FLV-116-WW T182-7	1/24/89	76.89	12.40	1.31	0.09	0.02	0.49	0.21	2.96	5.63	100.00	0.7206
44	1890	JT-NOVA-1600 T150-7	11/9/87	77.18	12.98	0.81	0.04	0.08	0.48	0.06	3.42	4.96	100.01	0.7205
45	1889	JT-NOVA-1 T150-6	11/9/87	77.01	13.15	0.75	0.04	0.08	0.48	0.05	3.31	5.14	100.01	0.7204
46	15	BCF-1, T7-13, pd		77.17	13.12	0.75	0.15	0.04	0.37	0.19	3.59	4.63	100.01	0.7201
47	270	PICO-21, T2-8		77.06	13.00	0.79	0.03	0.04	0.47	0.05	3.88	4.67	99.99	0.7200
48	2225	FBP2-1 T184-5	2/28/89	76.64	12.65	1.66	0.03	0.05	0.47	0.14	3.35	5.02	100.01	0.7197
49	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.7196
50	129	GV-78-23, T16-2		75.69	12.92	1.84	0.01	0.05	0.47	0.14	1.79	7.09	100.00	0.7193

III. Listing of 50 closest matches for COMP. NO. 1899 for elements: Na, Al, Si, Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	1.0000
2	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.9457
3	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.9339
4	2141	HPDA-11.06 A 2 sh		76.10	12.95	1.15	0.05	0.03	0.47	0.13	2.87	6.24	99.99	0.9338
5	131	GV-78-29, T16-4		76.22	13.26	0.85	0.03	0.00	0.48	0.09	2.70	6.37	100.00	0.9337
6	2230	FLV-111-WW T185-3	2/28/89	76.95	12.50	0.82	0.02	0.08	0.46	0.06	2.87	6.23	99.99	0.9295
7	1497	AMAR-1 T80-1	7/20/84	76.72	12.93	0.77	0.06	0.07	0.49	0.08	2.80	6.08	100.00	0.9276
8	2367	PR-77 T197-5	9/14/89	76.95	12.59	0.87	0.04	0.07	0.47	0.09	2.71	6.20	99.99	0.9271
9	2276	T191-6 FLV-77-HT	5/10/89	76.97	12.56	0.73	0.05	0.04	0.46	0.11	2.64	6.44	100.00	0.9256
10	114	GV-76-6, T16-11		77.28	12.92	0.73	0.05	0.10	0.44	0.11	2.86	5.50	99.99	0.9249
11	2231	FLV-112-WW LIGHT T185-4	2/28/89	76.98	12.66	0.80	0.03	0.07	0.46	0.06	2.99	5.96	100.01	0.9221
12	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.9210
13	2199	FLV-115-WW T182-6	1/24/89	77.09	12.37	1.27	0.08	0.01	0.47	0.19	2.89	5.63	100.00	0.9201
14	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.9191
15	2356	FLV-110-WW T196-4	8/7/89	77.16	12.22	1.28	0.08	0.03	0.48	0.18	2.74	5.84	100.01	0.9184
16	1344	BE-15-A1 T106-6	8/29/85	77.12	12.52	0.82	0.06	0.07	0.48	0.14	2.68	6.11	100.00	0.9177
17	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.9177
18	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.9177
19	2197	FLV-111B-WW T182-4	1/24/89	76.75	12.95	0.80	0.02	0.02	0.47	0.07	3.06	5.85	99.99	0.9167
20	2120	N-6 T175-10	10/28/88	77.13	13.06	0.92	0.05	0.07	0.52	0.09	2.76	5.39	99.99	0.9147
21	1520	JP 85 TPS-7 T120-2	4/29/86	76.33	12.86	0.78	0.06	0.07	0.40	0.11	2.78	6.61	100.00	0.9122
22	2107	KRL-82982-A T174-10	10/28/88	75.33	13.33	1.32	0.09	0.02	0.43	0.31	3.12	6.05	100.00	0.9083
23	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.9073
24	751	HC-11		77.33	12.22	1.32	0.09	0.04	0.49	0.20	2.90	5.41	100.00	0.9062
25	2200	FLV-116-WW T182-7	1/24/89	76.89	12.40	1.31	0.09	0.02	0.49	0.21	2.96	5.63	100.00	0.9055
26	851	LM-4		76.91	12.63	1.19	0.02	0.03	0.49	0.10	3.01	5.62	100.00	0.9051
27	856	LM-10		76.85	12.61	0.97	0.05	0.05	0.51	0.15	2.90	5.90	99.99	0.9045
28	130	GV-78-27, T16-3		76.55	13.38	1.26	0.04	0.00	0.56	0.11	2.72	5.38	100.00	0.9020
29	1856	FLV-27-WW T147-3	9/30/87	77.81	12.35	0.54	0.05	0.08	0.43	0.10	2.95	5.69	100.00	0.9016
30	1887	JT-6387-1 T150-3	9/11/87	77.50	12.56	0.75	0.03	0.02	0.44	0.06	3.08	5.55	99.99	0.9013
31	1840	FLV-16-WW T146-4	8/25/87	77.22	12.84	0.75	0.07	0.05	0.49	0.10	3.09	5.39	100.00	0.9013
32	2223	FPB-1 T184-3	2/28/89	76.61	12.71	1.62	0.03	0.05	0.46	0.12	3.32	5.07	99.99	0.9010
33	1921	86LP-38 T154-7	2/24/88	77.15	12.70	0.58	0.05	0.08	0.42	0.09	2.59	6.33	99.99	0.9009
34	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.9009
35	235	MV-I, T39-2		76.39	13.20	0.99	0.05	0.06	0.50	0.05	3.15	5.60	99.99	0.9005
36	392	TECO-30G, T17-14		76.75	12.66	1.72	0.03	0.03	0.55	0.13	2.78	5.36	100.01	0.8995
37	2232	FLV-112-WW DARK T185-5	2/28/89	77.20	12.47	0.81	0.04	0.04	0.49	0.08	3.04	5.82	99.99	0.8994
38	128	GV-78-22, T16-1		77.07	12.94	0.67	0.05	0.06	0.48	0.10	3.22	5.41	100.00	0.8991
39	875	LM-41		76.58	13.01	0.70	0.05	0.06	0.49	0.09	3.20	5.81	99.99	0.8982
40	134	GV-78-34A, T16-7		77.10	12.88	0.92	0.04	0.05	0.51	0.08	3.04	5.38	100.00	0.8968
41	668	CAPIS-1, T54-1	xx/xx/xx	78.43	12.27	1.29	0.08	0.04	0.48	0.18	3.05	4.17	99.99	0.8966
42	1889	JT-NOVA-1 T150-6	11/9/87	77.01	13.15	0.75	0.04	0.08	0.48	0.05	3.31	5.14	100.01	0.8966
43	2229	FLV-76-WW T185-2	2/28/89	77.93	12.16	0.86	0.11	0.02	0.46	0.18	3.20	5.09	100.01	0.8963
44	2352	FLV-75-FC T196-6	8/7/89	77.35	12.69	0.84	0.05	0.03	0.50	0.08	3.06	5.40	100.00	0.8961
45	2192	RFIP-1 (HIFE) AV24SHARDS T179-	12/21/88	77.08	12.15	1.46	0.03	0.04	0.48	0.14	3.09	5.53	100.00	0.8961
46	1441	0808502 SILICIC FR.	12/12/85	77.58	12.68	0.67	0.05	0.08	0.45	0.10	3.28	5.11	100.00	0.8946
47	300	PRL, T25-2		76.32	12.84	1.22	0.04	0.04	0.47	0.09	3.40	5.58	100.00	0.8937
48	2224	FPUP-1 T184-4	2/28/89	76.57	12.72	1.65	0.02	0.05	0.47	0.14	3.36	5.01	99.99	0.8935
49	2117	RFIP-1 (-100+200) T175-6	10/28/88	76.68	12.44	1.55	0.06	0.04	0.49	0.15	3.14	5.46	100.01	0.8933
50	120	GV-77-3, T15-11		77.13	12.78	0.91	0.06	0.07	0.52	0.08	3.01	5.44	100.00	0.8931

Listing of 50 closest matches for COMP. NO. 1899 for elements: Na, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	1.0000
2	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.9527
3	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.9382
4	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.9080
5	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.9080
6	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8909
7	668	CAPIS-1, T54-1	xx/xx/xx	78.43	12.27	1.29	0.08	0.04	0.48	0.18	3.05	4.17	99.99	0.8895
8	488	758-354H, T16-15, low total		76.93	14.04	1.46	0.03	0.01	0.52	0.10	3.62	3.29	100.00	0.8826
9	337	SALTON-2, T2-14		77.55	12.98	0.76	0.04	0.05	0.46	0.07	4.48	3.60	99.99	0.8778
10	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.8749
11	275	PICO-40A, T8-7		77.94	12.89	0.81	0.04	0.03	0.45	0.05	3.82	3.97	100.00	0.8742
12	1936	NH-5 T155-8	5/15/88	77.56	13.10	0.75	0.04	0.09	0.47	0.08	4.40	3.51	100.00	0.8733
13	1740	BRICE-2 T-136-7	4/22/87	77.25	13.45	1.26	0.15	0.08	0.56	0.21	3.59	3.47	100.02	0.8732
14	277	PICO-43, T36-3		76.85	12.90	0.73	0.03	0.03	0.47	0.05	3.93	4.02	99.01	0.8709
15	114	GV-76-6, T16-11		77.28	12.92	0.73	0.05	0.10	0.44	0.11	2.86	5.50	99.99	0.8704
16	254	P-100, T22-4		77.78	12.86	0.75	0.03	0.05	0.45	0.06	4.27	3.75	100.00	0.8695
17	436	4-252A, T40-7		76.02	14.41	0.69	0.13	0.08	0.53	0.05	4.19	3.90	100.00	0.8660
18	2120	N-6 T175-10	10/28/88	77.13	13.06	0.92	0.05	0.07	0.52	0.09	2.76	5.39	99.99	0.8650
19	1454	RABEK Y8 T115-6	01/27/86	78.73	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.97	100.01	0.8644
20	444	63CJ-26(3), T1, N-ASW-2, P		77.64	12.88	0.74	0.03	0.02	0.46	0.07	3.72	4.43	99.99	0.8643
21	336	SALTON-1, T20-3		77.94	12.65	0.76	0.02	0.03	0.48	0.05	4.47	3.61	100.01	0.8642
22	1844	FLV-19-WW T146-7	8/25/87	77.31	13.24	0.72	0.04	0.08	0.48	0.06	3.76	4.31	100.00	0.8641
23	1470	RABEK Y8 T115-6 CORR K	1/27/86	78.72	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.98	100.01	0.8640
24	2199	FLV-115-WW T182-6	1/24/89	77.09	12.37	1.27	0.08	0.01	0.47	0.19	2.89	5.63	100.00	0.8636
25	218	MILLVILLE-5, T28-3		75.91	14.43	0.65	0.13	0.11	0.53	0.05	4.25	3.94	100.00	0.8628
26	2223	FPB-1 T184-3	2/28/89	76.61	12.71	1.62	0.03	0.05	0.46	0.12	3.32	5.07	99.99	0.8624
27	17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.8623
28	2141	HPDA-11.06 A 2 sh		76.10	12.95	1.15	0.05	0.03	0.47	0.13	2.87	6.24	99.99	0.8621
29	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.8617
30	1538	PICO 82 T124-9	5/5/86	79.30	13.14	0.67	0.06	0.04	0.71	0.08	2.78	3.22	100.00	0.8608
31	2221	KRL-880828-N T181B-7	1/23/89	77.35	12.96	0.71	0.03	0.03	0.46	0.07	3.48	4.90	99.99	0.8608
32	1497	AMAR-1 T80-1	7/20/84	76.72	12.93	0.77	0.06	0.07	0.49	0.08	2.80	6.08	100.00	0.8601
33	1442	030685O6A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.8601
34	1433	ASW 62285-2 (2) T114-1	12/12/85	77.78	12.55	0.78	0.04	0.06	0.46	0.08	3.40	4.85	100.00	0.8600
35	131	GV-78-29, T16-4		76.22	13.26	0.85	0.03	0.00	0.48	0.09	2.70	6.37	100.00	0.8597
36	338	SALTON-2A, T20-4		77.84	12.72	0.69	0.03	0.01	0.48	0.07	4.41	3.75	100.00	0.8595
37	273	PICO-39A(1), T8-6		77.32	12.99	0.75	0.04	0.05	0.46	0.05	3.90	4.44	100.00	0.8592
38	2230	FLV-111-WW T185-3	2/28/89	76.95	12.50	0.82	0.02	0.08	0.46	0.06	2.87	6.23	99.99	0.8589
39	1742	FL86C-5.41 T-136-9	4/22/87	77.75	12.34	1.25	0.04	0.05	0.47	0.11	3.75	4.25	100.01	0.8589
40	2140	FL86C-5.41 C 2 sh		78.26	12.59	1.01	0.08	0.07	0.55	0.04	3.70	3.72	100.02	0.8582
41	2231	FLV-112-WW LIGHT T185-4	2/28/89	76.98	12.66	0.80	0.03	0.07	0.46	0.06	2.99	5.96	100.01	0.8582
42	2224	FPUP-1 T184-4	2/28/89	76.57	12.72	1.65	0.02	0.05	0.47	0.14	3.36	5.01	99.99	0.8581
43	2229	FLV-76-WW T185-2	2/28/89	77.93	12.16	0.86	0.11	0.02	0.46	0.18	3.20	5.09	100.01	0.8581
44	452	81B051, T35-5		76.52	12.77	0.74	0.04	0.02	0.46	0.07	3.67	4.72	99.01	0.8579
45	751	HC-11		77.33	12.22	1.32	0.09	0.04	0.49	0.20	2.90	5.41	100.00	0.8577
46	2356	FLV-110-WW T196-4	8/7/89	77.16	12.22	1.28	0.08	0.03	0.48	0.18	2.74	5.84	100.01	0.8577
47	2150	JT-DV45BB-1 T177-3	12/5/88	78.19	12.38	0.75	0.04	0.04	0.44	0.07	3.17	4.93	100.01	0.8576
48	2367	PR-77 T197-5	9/14/89	76.95	12.59	0.87	0.04	0.07	0.47	0.09	2.71	6.20	99.99	0.8575
49	239	OAK RUN-2, T27-6		76.04	14.25	0.64	0.13	0.09	0.54	0.06	4.43	3.82	100.00	0.8575
50	1827	FLV-2-CS T145-5	8/24/87	77.61	12.81	0.72	0.05	0.09	0.47	0.06	3.73	4.47	100.01	0.8574

Listing of 50 closest matches for COMP. NO. 1899 for elements: Na, Al, Si, K , Ca, Fe Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total.R	Sim. Co
1	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	1.0000
2	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.9885
3	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.9217
4	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8946
5	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8418
6	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8418
7	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.8183
8	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.7964
9	1454	RABEK Y8 T115-6	01/27/86	78.73	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.97	100.01	0.7876
10	1470	RABEK Y8 T115-6 CORR K	1/27/86	78.72	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.98	100.01	0.7872
11	337	SALTON-2, T2-14		77.55	12.98	0.76	0.04	0.05	0.46	0.07	4.48	3.60	99.99	0.7819
12	598	SM-ASH-34, T56-7	07/01/83	77.08	13.59	0.54	0.10	0.06	0.54	0.08	3.95	4.07	100.01	0.7797
13	1453	LOS CHOCOYOS SC-7 T116-3	01/28/86	78.24	12.84	0.44	0.11	0.09	0.65	0.10	3.36	4.16	99.99	0.7791
14	1936	NH-5 T155-8	5/15/88	77.56	13.10	0.75	0.04	0.09	0.47	0.08	4.40	3.51	100.00	0.7789
15	277	PICO-43, T36-3		76.85	12.90	0.73	0.03	0.03	0.47	0.05	3.93	4.02	99.01	0.7782
16	218	MILLVILLE-5, T28-3		75.91	14.43	0.65	0.13	0.11	0.53	0.05	4.25	3.94	100.00	0.7780
17	114	GV-76-6, T16-11		77.28	12.92	0.73	0.05	0.10	0.44	0.11	2.86	5.50	99.99	0.7779
18	2013	SAFZ-2 T167-5	7/19/88	77.75	12.93	0.60	0.05	0.06	0.42	0.12	4.35	3.72	100.00	0.7777
19	17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.7775
20	436	4-252A, T40-7		76.02	14.41	0.69	0.13	0.08	0.53	0.05	4.19	3.90	100.00	0.7772
21	1856	FLV-27-WW T147-3	9/30/87	77.81	12.35	0.54	0.05	0.08	0.43	0.10	2.95	5.69	100.00	0.7772
22	275	PICO-40A, T8-7		77.94	12.89	0.81	0.04	0.03	0.45	0.05	3.82	3.97	100.00	0.7758
23	254	P-100, T22-4		77.78	12.86	0.75	0.03	0.05	0.45	0.06	4.27	3.75	100.00	0.7757
24	1538	PICO 82 T124-9	5/5/86	79.30	13.14	0.67	0.06	0.04	0.71	0.08	2.78	3.22	100.00	0.7746
25	239	OAK RUN-2, T27-6		76.04	14.25	0.64	0.13	0.09	0.54	0.06	4.43	3.82	100.00	0.7744
26	2147	SAFZ-5, T167-8, lo Ca 10sh		77.15	13.53	0.55	0.05	0.09	0.58	0.08	4.35	3.64	100.02	0.7744
27	1844	FLV-19-WW T146-7	8/25/87	77.31	13.24	0.72	0.04	0.08	0.48	0.06	3.76	4.31	100.00	0.7734
28	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	0.7728
29	444	63CJ-26(3), T1, N-ASW-2, P		77.64	12.88	0.74	0.03	0.02	0.46	0.07	3.72	4.43	99.99	0.7721
30	338	SALTON-2A, T20-4		77.84	12.72	0.69	0.03	0.01	0.48	0.07	4.41	3.75	100.00	0.7718
31	2221	KRL-880828-N T181B-7	1/23/89	77.35	12.96	0.71	0.03	0.03	0.46	0.07	3.48	4.90	99.99	0.7713
32	1671	84 NV 14-1	10/21/86	77.45	12.68	0.58	0.05	0.06	0.46	0.07	3.75	4.89	99.99	0.7710
33	7	ASH CREEK-1, T28-1		75.93	14.35	0.63	0.12	0.10	0.54	0.05	3.98	4.30	100.00	0.7710
34	668	CAPIS-1, T54-1	xx/xx/xx	78.43	12.27	1.29	0.08	0.04	0.48	0.18	3.05	4.17	99.99	0.7710
35	104	FRIANT-2, T18-6		77.53	12.86	0.68	0.03	0.03	0.47	0.06	3.40	4.94	100.00	0.7709
36	1441	0808502 SILICIC FR.	12/12/85	77.58	12.68	0.67	0.05	0.08	0.45	0.10	3.28	5.11	100.00	0.7707
37	336	SALTON-1, T20-3		77.94	12.65	0.76	0.02	0.03	0.48	0.05	4.47	3.61	100.01	0.7706
38	2001	WL-5-12 (61.28M) lo Ca fract.	5/22/88	77.54	12.80	0.61	0.01	0.06	0.45	0.05	3.85	4.63	100.00	0.7688
39	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.7686
40	1989	WL-5-22 (85.15m) T165-2	5/22/88	77.93	12.32	0.60	0.05	0.06	0.46	0.11	3.77	4.71	100.01	0.7682
41	1865	FLV-36-WW T147-10	9/30/87	77.47	12.83	0.58	0.05	0.09	0.43	0.11	3.66	4.76	99.98	0.7680
42	1827	FLV-2-CS T145-5	8/24/87	77.61	12.81	0.72	0.05	0.09	0.47	0.06	3.73	4.47	100.01	0.7678
43	128	GV-78-22, T16-1		77.07	12.94	0.67	0.05	0.06	0.48	0.10	3.22	5.41	100.00	0.7672
44	273	PICO-39A(1), T8-6		77.32	12.99	0.75	0.04	0.05	0.46	0.05	3.90	4.44	100.00	0.7671
45	1252	TLN-4 T96-11	5/29/85	77.26	12.83	0.58	0.04	0.08	0.45	0.08	3.95	4.74	100.01	0.7669
46	452	81B051, T35-5		76.52	12.77	0.74	0.04	0.02	0.46	0.07	3.67	4.72	99.01	0.7667
47	1174	ALT-4 t89-1	3/1/85	77.64	12.84	0.64	0.08	0.05	0.50	0.10	3.86	4.28	99.99	0.7666
48	1497	AMAR-1 T80-1	7/20/84	76.72	12.93	0.77	0.06	0.07	0.49	0.08	2.80	6.08	100.00	0.7666
49	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.7661
50	2150	JT-DV45BB-1 T177-3	12/5/88	78.19	12.38	0.75	0.04	0.04	0.44	0.07	3.17	4.93	100.01	0.7658

Listing of 50 closest matches for COMP. NO. 1899 for elements: Na, Mg, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	1.0000
2	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.9364
3	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.9044
4	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.9002
5	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8943
6	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8943
7	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	0.8356
8	673	TULELAKE-715 (wh pum), T59-A1	xx/xx/xx	70.87	15.50	2.67	0.68	0.06	1.99	0.42	4.14	3.68	100.01	0.7908
9	653	6R008A, T66-1	10/25/83	69.98	15.75	2.74	0.77	0.05	2.82	0.52	3.82	3.54	99.99	0.7763
10	68	DSDP-1, T9-3, low total		75.79	14.88	0.11	0.49	0.01	0.96	0.01	2.43	5.32	100.00	0.7744
11	654	57M(1), T55-3 (not orig oxids)	xx/xx/xx	71.59	15.64	2.90	0.71	0.07	2.45	0.44	3.45	2.75	100.00	0.7718
12	1842	FLV-17-WW T146-5	8/25/87	71.88	15.85	2.30	0.60	0.05	2.15	0.29	3.72	3.15	99.99	0.7707
13	1428	ASW-6985-3 T103-3	08/26/85	70.60	15.08	2.68	0.69	0.07	2.17	0.42	4.38	3.91	100.00	0.7695
14	671	TULELAKE-715 (tan pum), T59-A2	xx/xx/xx	70.79	15.00	2.65	0.66	0.08	1.98	0.44	4.79	3.62	100.01	0.7684
15	674	TULELAKE-715 (int pum), T59-A3	xx/xx/xx	70.65	15.15	2.69	0.65	0.07	1.97	0.46	4.69	3.68	100.01	0.7668
16	638	TULELAKE-712, T67-3	11/18/83	70.65	15.19	2.70	0.64	0.07	1.97	0.45	4.64	3.69	100.00	0.7654
17	1740	BRICE-2 T-136-7	4/22/87	77.25	13.45	1.26	0.15	0.08	0.56	0.21	3.59	3.47	100.02	0.7639
18	1124	T-693 T83-12	10/12/84	71.02	14.62	2.67	0.67	0.06	2.00	0.45	4.83	3.68	100.00	0.7636
19	639	TULELAKE-712(200-325), T67-4	11/18/83	70.25	15.31	2.82	0.77	0.06	2.20	0.46	4.53	3.60	100.00	0.7629
20	1154	15-IV-84-9A T86-8	12/4/84	71.75	14.69	2.57	0.63	0.06	2.17	0.46	4.26	3.41	100.00	0.7618
21	668	CAPIS-1, T54-1	xx/xx/xx	78.43	12.27	1.29	0.08	0.04	0.48	0.18	3.05	4.17	99.99	0.7606
22	1676	RUSH CR-1 T133-2	10/21/86	71.66	14.65	2.76	0.62	0.08	1.71	0.64	4.57	3.31	100.00	0.7562
23	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.7557
24	1366	B7-1/2-TM1-Z2 T104-2	8/26/85	72.51	13.42	3.12	0.59	0.03	1.96	0.71	3.67	4.00	100.01	0.7534
25	436	4-252A, T40-7		76.02	14.41	0.69	0.13	0.08	0.53	0.05	4.19	3.90	100.00	0.7531
26	218	MILLVILLE-5, T28-3		75.91	14.43	0.65	0.13	0.11	0.53	0.05	4.25	3.94	100.00	0.7504
27	869	LM-25		73.87	15.54	2.03	0.36	0.07	1.73	0.28	3.01	3.11	100.00	0.7501
28	17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.7499
29	1125	T-704 T83-13	10/12/84	70.51	14.66	2.78	0.76	0.08	2.18	0.49	4.92	3.63	100.01	0.7497
30	2374	PU-17 T201-2	10/12/89	77.09	13.55	1.31	0.19	0.04	0.84	0.25	3.20	3.53	100.00	0.7478
31	239	OAK RUN-2, T27-6		76.04	14.25	0.64	0.13	0.09	0.54	0.06	4.43	3.82	100.00	0.7460
32	1095	61384-24 ASW T81-12	9/4/84	70.95	14.70	3.20	0.56	0.10	1.82	0.55	3.94	4.16	99.98	0.7444
33	1316	ASW-6985-4C T103-6	8/26/85	69.82	15.16	3.25	0.68	0.10	1.92	0.63	5.30	3.12	99.98	0.7442
34	1314	ASW-6985-1 T103-1	8/26/85	69.68	15.16	3.27	0.71	0.10	1.98	0.67	5.25	3.18	100.00	0.7440
35	1426	ASW-6985-1 T103-1 Bel	08/26/85	69.68	15.16	3.27	0.71	0.10	1.98	0.67	5.25	3.18	100.00	0.7440
36	890	CB-25		77.97	11.42	1.78	0.13	0.03	0.44	0.51	3.71	4.01	100.00	0.7433
37	488	758-354H, T16-15, low total		76.93	14.04	1.46	0.03	0.01	0.52	0.10	3.62	3.29	100.00	0.7427
38	1427	ASW-6985-2 T103-2 Bel	08/26/85	71.17	15.46	2.49	0.53	0.07	1.69	0.42	4.77	3.40	100.00	0.7421
39	1454	RABEK Y8 T115-6	01/27/86	78.73	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.97	100.01	0.7421
40	1470	RABEK Y8 T115-6 CORR K	1/27/86	78.72	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.98	100.01	0.7417
41	2229	FLV-76-WW T185-2	2/28/89	77.93	12.16	0.86	0.11	0.02	0.46	0.18	3.20	5.09	100.01	0.7416
42	1011	TULE LAKE 715 (682) T74-8	5/30/84	71.49	14.92	2.41	0.55	0.05	1.64	0.41	4.60	3.93	100.00	0.7415
43	337	SALTON-2, T2-14		77.55	12.98	0.76	0.04	0.05	0.46	0.07	4.48	3.60	99.99	0.7411
44	824	GS-70		70.64	14.97	3.96	0.83	0.05	2.40	0.81	3.52	2.81	99.99	0.7402
45	96	DSDP-173-1-4(1), T42-5		70.75	14.72	3.13	0.67	0.06	2.14	0.72	4.78	3.01	99.98	0.7396
46	7	ASH CREEK-1, T28-1		75.93	14.35	0.63	0.12	0.10	0.54	0.05	3.98	4.30	100.00	0.7391
47	1026	KRL-71082N-3 (591) T58-2	6/22/84	67.94	16.62	2.48	0.77	0.00	2.90	0.48	4.99	3.81	99.99	0.7391
48	2199	FLV-115-WW T182-6	1/24/89	77.09	12.37	1.27	0.08	0.01	0.47	0.19	2.89	5.63	100.00	0.7390
49	95	DSDP-173-1-3(2), T42-1		70.43	15.03	3.14	0.68	0.08	2.25	0.66	4.80	2.93	100.00	0.7386
50	1315	ASW-6985-4B T103-5	8/26/85	69.83	15.17	3.27	0.66	0.10	1.88	0.66	5.33	3.09	99.99	0.7385

IV. Listing of 50 closest matches for COMP. NO. 1900 for elements: Na, Al, Si, Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	1.0000
2	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.9722
3	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9457
4	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.9433
5	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.9389
6	131	GV-78-29, T16-4		76.22	13.26	0.85	0.03	0.00	0.48	0.09	2.70	6.37	100.00	0.9300
7	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.9262
8	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.9241
9	1344	BE-15-A1 T106-6	8/29/85	77.12	12.52	0.82	0.06	0.07	0.48	0.14	2.68	6.11	100.00	0.9209
10	1451	126-1265 t115-13	1/28/86	77.58	12.59	0.89	0.07	0.08	0.44	0.12	2.36	5.87	100.00	0.9197
11	2276	T191-6 FLV-77-HT	5/10/89	76.97	12.56	0.73	0.05	0.04	0.46	0.11	2.64	6.44	100.00	0.9150
12	2367	PR-77 T197-5	9/14/89	76.95	12.59	0.87	0.04	0.07	0.47	0.09	2.71	6.20	99.99	0.9149
13	1497	AMAR-1 T80-1	7/20/84	76.72	12.93	0.77	0.06	0.07	0.49	0.08	2.80	6.08	100.00	0.9133
14	2356	FLV-110-WW T196-4	8/7/89	77.16	12.22	1.28	0.08	0.03	0.48	0.18	2.74	5.84	100.01	0.9111
15	1927	86LP39, T157-1	03/14/88	76.57	12.90	0.57	0.04	0.08	0.56	0.07	2.47	6.75	100.01	0.9105
16	2141	HPDA-11.06 A 2 sh		76.10	12.95	1.15	0.05	0.03	0.47	0.13	2.87	6.24	99.99	0.9063
17	2120	N-6 T175-10	10/28/88	77.13	13.06	0.92	0.05	0.07	0.52	0.09	2.76	5.39	99.99	0.9036
18	1921	86LP-38 T154-7	2/24/88	77.15	12.70	0.58	0.05	0.08	0.42	0.09	2.59	6.33	99.99	0.9002
19	2073	CCP-C T172-2	9/28/88	77.06	12.19	1.53	0.05	0.02	0.50	0.14	2.09	6.42	100.00	0.8979
20	2199	FLV-115-WW T182-6	1/24/89	77.09	12.37	1.27	0.08	0.01	0.47	0.19	2.89	5.63	100.00	0.8971
21	2230	FLV-111-WW T185-3	2/28/89	76.95	12.50	0.82	0.02	0.08	0.46	0.06	2.87	6.23	99.99	0.8958
22	130	GV-78-27, T16-3		76.55	13.38	1.26	0.04	0.00	0.56	0.11	2.72	5.38	100.00	0.8956
23	2197	FLV-111B-WW T182-4	1/24/89	76.75	12.95	0.80	0.02	0.02	0.47	0.07	3.06	5.85	99.99	0.8954
24	1452	126-1303 t115-14	1/28/86	77.67	12.53	0.89	0.04	0.08	0.39	0.11	2.44	5.84	99.99	0.8945
25	851	LM-4		76.91	12.63	1.19	0.02	0.03	0.49	0.10	3.01	5.62	100.00	0.8936
26	2200	FLV-116-WW T182-7	1/24/89	76.89	12.40	1.31	0.09	0.02	0.49	0.21	2.96	5.63	100.00	0.8934
27	751	HC-11		77.33	12.22	1.32	0.09	0.04	0.49	0.20	2.90	5.41	100.00	0.8934
28	114	GV-76-6, T16-11		77.28	12.92	0.73	0.05	0.10	0.44	0.11	2.86	5.50	99.99	0.8917
29	856	LM-10		76.85	12.61	0.97	0.05	0.05	0.51	0.15	2.90	5.90	99.99	0.8914
30	1850	FLV-29-WW T146-13	8/25/87	76.85	12.65	0.55	0.06	0.08	0.41	0.06	2.20	7.13	99.99	0.8908
31	1840	FLV-16-WW T146-4	8/25/87	77.22	12.84	0.75	0.07	0.05	0.49	0.10	3.09	5.39	100.00	0.8907
32	2204	M86TH-106 T183-3	1/25/89	76.64	11.96	1.79	0.07	0.02	0.56	0.25	2.30	6.39	99.98	0.8906
33	128	GV-78-22, T16-1		77.07	12.94	0.67	0.05	0.06	0.48	0.10	3.22	5.41	100.00	0.8900
34	2231	FLV-112-WW LIGHT T185-4	2/28/89	76.98	12.66	0.80	0.03	0.07	0.46	0.06	2.99	5.96	100.01	0.8898
35	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.8897
36	1889	JT-NOVA-1 T150-6	11/9/87	77.01	13.15	0.75	0.04	0.08	0.48	0.05	3.31	5.14	100.01	0.8884
37	2232	FLV-112-WW DARK T185-5	2/28/89	77.20	12.47	0.81	0.04	0.04	0.49	0.08	3.04	5.82	99.99	0.8881
38	235	MV-I, T39-2		76.39	13.20	0.99	0.05	0.06	0.50	0.05	3.15	5.60	99.99	0.8877
39	875	LM-41		76.58	13.01	0.70	0.05	0.06	0.49	0.09	3.20	5.81	99.99	0.8872
40	2139	FL86C-5.41 B 1 sh		77.20	12.21	1.16	0.06	0.06	0.38	0.08	2.39	6.45	99.99	0.8868
41	1863	FLV-34-WW T147-8	9/30/87	76.85	12.93	0.62	0.08	0.06	0.62	0.10	2.52	6.22	100.00	0.8861
42	668	CAPIS-1, T54-1	xx/xx/xx	78.43	12.27	1.29	0.08	0.04	0.48	0.18	3.05	4.17	99.99	0.8855
43	2192	RFIP-1 (HIFE) AV24SHARDS T179-	12/21/88	77.08	12.15	1.46	0.03	0.04	0.48	0.14	3.09	5.53	100.00	0.8854
44	134	GV-78-34A, T16-7		77.10	12.88	0.92	0.04	0.05	0.51	0.08	3.04	5.38	100.00	0.8853
45	2352	FLV-75-FC T196-6	8/7/89	77.35	12.69	0.84	0.05	0.03	0.50	0.08	3.06	5.40	100.00	0.8849
46	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.8845
47	392	TECO-30G, T17-14		76.75	12.66	1.72	0.03	0.03	0.55	0.13	2.78	5.36	100.01	0.8840
48	1907	OT-2 T149-5	11/11/87	78.22	12.23	0.58	0.05	0.08	0.39	0.08	2.33	6.05	100.01	0.8829
49	2117	RFIP-1 (-100+200) T175-6	10/28/88	76.68	12.44	1.55	0.06	0.04	0.49	0.15	3.14	5.46	100.01	0.8822
50	1186	VW-CIMA (2) t89-14	2/28/85	76.59	11.91	1.88	0.06	0.04	0.54	0.17	2.70	6.12	100.01	0.8822

Listing of 50 closest matches for COMP. NO. 1900 for elements: Na, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	1.0000
2	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.9726
3	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9527
4	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.9022
5	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.8933
6	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8817
7	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8817
8	488	758-354H, T16-15, low total		76.93	14.04	1.46	0.03	0.01	0.52	0.10	3.62	3.29	100.00	0.8812
9	668	CAPIS-1, T54-1	xx/xx/xx	78.43	12.27	1.29	0.08	0.04	0.48	0.18	3.05	4.17	99.99	0.8773
10	1740	BRICE-2 T-136-7	4/22/87	77.25	13.45	1.26	0.15	0.08	0.56	0.21	3.59	3.47	100.02	0.8711
11	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.8683
12	1936	NH-5 T155-8	5/15/88	77.56	13.10	0.75	0.04	0.09	0.47	0.08	4.40	3.51	100.00	0.8679
13	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.8660
14	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.8633
15	336	SALTON-1, T20-3		77.94	12.65	0.76	0.02	0.03	0.48	0.05	4.47	3.61	100.01	0.8593
16	209	LOCK-4, T41-3		77.42	13.05	0.88	0.05	0.04	0.50	0.10	4.52	3.45	100.01	0.8574
17	1844	FLV-19-WW T146-7	8/25/87	77.31	13.24	0.72	0.04	0.08	0.48	0.06	3.76	4.31	100.00	0.8570
18	637	TULELAKE-542, T61-12(2)	08/26/83	77.31	13.35	0.87	0.09	0.05	0.55	0.08	4.17	3.53	100.00	0.8564
19	337	SALTON-2, T2-14		77.55	12.98	0.76	0.04	0.05	0.46	0.07	4.48	3.60	99.99	0.8564
20	436	4-252A, T40-7		76.02	14.41	0.69	0.13	0.08	0.53	0.05	4.19	3.90	100.00	0.8561
21	277	PICO-43, T36-3		76.85	12.90	0.73	0.03	0.03	0.47	0.05	3.93	4.02	99.01	0.8560
22	1451	126-1265 t115-13	1/28/86	77.58	12.59	0.89	0.07	0.08	0.44	0.12	2.36	5.87	100.00	0.8557
23	338	SALTON-2A, T20-4		77.84	12.72	0.69	0.03	0.01	0.48	0.07	4.41	3.75	100.00	0.8546
24	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.8545
25	131	GV-78-29, T16-4		76.22	13.26	0.85	0.03	0.00	0.48	0.09	2.70	6.37	100.00	0.8545
26	211	LOUIS-19, T35-8		75.84	13.05	2.12	0.09	0.02	0.66	0.27	2.63	4.32	99.00	0.8535
27	2120	N-6 T175-10	10/28/88	77.13	13.06	0.92	0.05	0.07	0.52	0.09	2.76	5.39	99.99	0.8535
28	218	MILLVILLE-5, T28-3		75.91	14.43	0.65	0.13	0.11	0.53	0.05	4.25	3.94	100.00	0.8526
29	17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.8522
30	1344	BE-15-A1 T106-6	8/29/85	77.12	12.52	0.82	0.06	0.07	0.48	0.14	2.68	6.11	100.00	0.8520
31	1538	PICO 82 T124-9	5/5/86	79.30	13.14	0.67	0.06	0.04	0.71	0.08	2.78	3.22	100.00	0.8508
32	275	PICO-40A, T8-7		77.94	12.89	0.81	0.04	0.03	0.45	0.05	3.82	3.97	100.00	0.8505
33	1454	RABEK Y8 T115-6	01/27/86	78.73	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.97	100.01	0.8496
34	2356	FLV-110-WW T196-4	8/7/89	77.16	12.22	1.28	0.08	0.03	0.48	0.18	2.74	5.84	100.01	0.8495
35	1470	RABEK Y8 T115-6 CORR K	1/27/86	78.72	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.98	100.01	0.8492
36	2140	FL86C-5.41 C 2 sh		78.26	12.59	1.01	0.08	0.07	0.55	0.04	3.70	3.72	100.02	0.8489
37	208	LOCK-3, T41-2		77.38	13.02	0.83	0.06	0.05	0.52	0.12	4.57	3.45	100.00	0.8486
38	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.8484
39	239	OAK RUN-2, T27-6		76.04	14.25	0.64	0.13	0.09	0.54	0.06	4.43	3.82	100.00	0.8483
40	1889	JT-NOVA-1 T150-6	11/9/87	77.01	13.15	0.75	0.04	0.08	0.48	0.05	3.31	5.14	100.01	0.8477
41	254	P-100, T22-4		77.78	12.86	0.75	0.03	0.05	0.45	0.06	4.27	3.75	100.00	0.8476
42	130	GV-78-27, T16-3		76.55	13.38	1.26	0.04	0.00	0.56	0.11	2.72	5.38	100.00	0.8473
43	1542	CHV-3 T124-13	5/5/86	77.65	12.33	1.58	0.03	0.03	0.53	0.13	4.12	3.60	100.00	0.8468
44	1497	AMAR-1 T80-1	7/20/84	76.72	12.93	0.77	0.06	0.07	0.49	0.08	2.80	6.08	100.00	0.8465
45	19	BHA-5II, T18-8		77.38	12.94	0.74	0.04	0.02	0.48	0.03	4.23	4.12	99.98	0.8463
46	2367	PR-77 T197-5	9/14/89	76.95	12.59	0.87	0.04	0.07	0.47	0.09	2.71	6.20	99.99	0.8454
47	1890	JT-NOVA-1600 T150-7	11/9/87	77.18	12.98	0.81	0.04	0.08	0.48	0.06	3.42	4.96	100.01	0.8454
48	207	LOCK-2, T-41-1		77.79	12.94	0.85	0.05	0.05	0.51	0.08	4.42	3.30	99.99	0.8452
49	751	HC-11		77.33	12.22	1.32	0.09	0.04	0.49	0.20	2.90	5.41	100.00	0.8448
50	339	SALTON-5, T2-10		77.38	12.82	0.76	0.04	0.05	0.47	0.05	4.58	3.84	99.99	0.8444

Listing of 50 closest matches for COMP. NO. 1900 for elements: Na, Al, Si, K , Ca, Fe Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	1.0000
2	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.9383
3	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9217
4	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8685
5	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8459
6	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8459
7	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.8379
8	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.8322
9	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.8047
10	1454	RABEK Y8 T115-6	01/27/86	78.73	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.97	100.01	0.7957
11	1453	LOS CHOCOYOS SC-7 T116-3	01/28/86	78.24	12.84	0.44	0.11	0.09	0.65	0.10	3.36	4.16	99.99	0.7957
12	1470	RABEK Y8 T115-6 CORR K	1/27/86	78.72	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.98	100.01	0.7954
13	598	SM-ASH-34, T56-7	07/01/83	77.08	13.59	0.54	0.10	0.06	0.54	0.08	3.95	4.07	100.01	0.7953
14	2147	SAFZ-5, T167-8, lo Ca 10sh		77.15	13.53	0.55	0.05	0.09	0.58	0.08	4.35	3.64	100.02	0.7903
15	1936	NH-5 T155-8	5/15/88	77.56	13.10	0.75	0.04	0.09	0.47	0.08	4.40	3.51	100.00	0.7899
16	218	MILLVILLE-5, T28-3		75.91	14.43	0.65	0.13	0.11	0.53	0.05	4.25	3.94	100.00	0.7874
17	17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.7871
18	436	4-252A, T40-7		76.02	14.41	0.69	0.13	0.08	0.53	0.05	4.19	3.90	100.00	0.7859
19	239	OAK RUN-2, T27-6		76.04	14.25	0.64	0.13	0.09	0.54	0.06	4.43	3.82	100.00	0.7851
20	338	SALTON-2A, T20-4		77.84	12.72	0.69	0.03	0.01	0.48	0.07	4.41	3.75	100.00	0.7846
21	1844	FLV-19-WW T146-7	8/25/87	77.31	13.24	0.72	0.04	0.08	0.48	0.06	3.76	4.31	100.00	0.7836
22	1538	PICO 82 T124-9	5/5/86	79.30	13.14	0.67	0.06	0.04	0.71	0.08	2.78	3.22	100.00	0.7836
23	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.7823
24	336	SALTON-1, T20-3		77.94	12.65	0.76	0.02	0.03	0.48	0.05	4.47	3.61	100.01	0.7818
25	277	PICO-43, T36-3		76.85	12.90	0.73	0.03	0.03	0.47	0.05	3.93	4.02	99.01	0.7818
26	1927	86LP39, T157-1	03/14/88	76.57	12.90	0.57	0.04	0.08	0.56	0.07	2.47	6.75	100.01	0.7816
27	7	ASH CREEK-1, T28-1		75.93	14.35	0.63	0.12	0.10	0.54	0.05	3.98	4.30	100.00	0.7802
28	2013	SAFZ-2 T167-5	7/19/88	77.75	12.93	0.60	0.05	0.06	0.42	0.12	4.35	3.72	100.00	0.7796
29	337	SALTON-2, T2-14		77.55	12.98	0.76	0.04	0.05	0.46	0.07	4.48	3.60	99.99	0.7794
30	1921	86LP-38 T154-7	2/24/88	77.15	12.70	0.58	0.05	0.08	0.42	0.09	2.59	6.33	99.99	0.7790
31	1174	ALT-4 t89-1	3/1/85	77.64	12.84	0.64	0.08	0.05	0.50	0.10	3.86	4.28	99.99	0.7789
32	1864	FLV-35-WW T147-9	9/30/87	77.58	12.69	0.60	0.06	0.07	0.49	0.10	3.76	4.65	100.00	0.7778
33	128	GV-78-22, T16-1		77.07	12.94	0.67	0.05	0.06	0.48	0.10	3.22	5.41	100.00	0.7764
34	1683	MRSN-1 T134-4	11/25/86	77.63	12.49	0.61	0.07	0.07	0.49	0.09	3.21	5.35	100.01	0.7760
35	2126	CRAW-88-3H T176-5	10/27/88	76.92	13.24	0.61	0.04	0.11	0.51	0.06	4.09	4.41	99.99	0.7755
36	1856	FLV-27-WW T147-3	9/30/87	77.81	12.35	0.54	0.05	0.08	0.43	0.10	2.95	5.69	100.00	0.7753
37	1165	ALT 3 T87-2	12/24/84	77.77	12.68	0.63	0.09	0.05	0.51	0.10	3.87	4.28	99.98	0.7748
38	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.7746
39	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.7743
40	104	FRIANT-2, T18-6		77.53	12.86	0.68	0.03	0.03	0.47	0.06	3.40	4.94	100.00	0.7737
41	1164	ALT 2A T87-1	12/24/84	77.89	12.55	0.65	0.08	0.05	0.50	0.10	3.91	4.27	100.00	0.7731
42	1889	JT-NOVA-1 T150-6	11/9/87	77.01	13.15	0.75	0.04	0.08	0.48	0.05	3.31	5.14	100.01	0.7731
43	254	P-100, T22-4		77.78	12.86	0.75	0.03	0.05	0.45	0.06	4.27	3.75	100.00	0.7730
44	19	BHA-5II, T18-8		77.38	12.94	0.74	0.04	0.02	0.48	0.03	4.23	4.12	99.98	0.7728
45	1907	OT-2 T149-5	11/11/87	78.22	12.23	0.58	0.05	0.08	0.39	0.08	2.33	6.05	100.01	0.7717
46	286	PICO-93, T22-7		77.49	12.81	0.73	0.03	0.02	0.49	0.08	4.45	3.91	100.01	0.7717
47	1671	84 NV 14-1	10/21/86	77.45	12.68	0.58	0.05	0.06	0.46	0.07	3.75	4.89	99.99	0.7714
48	209	LOCK-4, T41-3		77.42	13.05	0.88	0.05	0.04	0.50	0.10	4.52	3.45	100.01	0.7714
49	2220	KRL-880828-Q T181B-6	1/23/89	77.26	12.97	0.72	0.03	0.03	0.48	0.07	3.53	4.91	100.00	0.7712
50	637	TULELAKE-542, T61-12(2)	08/26/83	77.31	13.35	0.87	0.09	0.05	0.55	0.08	4.17	3.53	100.00	0.7711

Listing of 50 closest matches for COMP. No. 1900 for elements: Na, Mg, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	1.0000
2	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.9489
3	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9364
4	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8958
5	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8958
6	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8903
7	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	0.8183
8	68	DSDP-1, T9-3, low total		75.79	14.88	0.11	0.49	0.01	0.96	0.01	2.43	5.32	100.00	0.8179
9	1842	FLV-17-WW T146-5	8/25/87	71.88	15.85	2.30	0.60	0.05	2.15	0.29	3.72	3.15	99.99	0.7805
10	1740	BRICE-2 T-136-7	4/22/87	77.25	13.45	1.26	0.15	0.08	0.56	0.21	3.59	3.47	100.02	0.7683
11	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.7642
12	1366	B7-1/2-TM1-Z2 T104-2	8/26/85	72.51	13.42	3.12	0.59	0.03	1.96	0.71	3.67	4.00	100.01	0.7618
13	1676	RUSH CR-1 T133-2	10/21/86	71.66	14.65	2.76	0.62	0.08	1.71	0.64	4.57	3.31	100.00	0.7593
14	1427	ASW-6985-2 T103-2 Bel	08/26/85	71.17	15.46	2.49	0.53	0.07	1.69	0.42	4.77	3.40	100.00	0.7589
15	1154	15-IV-84-9A T86-8	12/4/84	71.75	14.69	2.57	0.63	0.06	2.17	0.46	4.26	3.41	100.00	0.7586
16	673	TULELAKE-715 (wh pum), T59-A1	xx/xx/xx	70.87	15.50	2.67	0.68	0.06	1.99	0.42	4.14	3.68	100.01	0.7577
17	668	CAPIS-1, T54-1	xx/xx/xx	78.43	12.27	1.29	0.08	0.04	0.48	0.18	3.05	4.17	99.99	0.7536
18	1095	61384-24 ASW T81-12	9/4/84	70.95	14.70	3.20	0.56	0.10	1.82	0.55	3.94	4.16	99.98	0.7534
19	1152	11-IV-84-0 T86-6	12/4/84	71.71	14.91	2.26	0.51	0.09	1.50	0.50	5.05	3.46	99.99	0.7529
20	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.7527
21	638	TULELAKE-712, T67-3	11/18/83	70.65	15.19	2.70	0.64	0.07	1.97	0.45	4.64	3.69	100.00	0.7525
22	1011	TULE LAKE 715 (682) T74-8	5/30/84	71.49	14.92	2.41	0.55	0.05	1.64	0.41	4.60	3.93	100.00	0.7525
23	869	LM-25		73.87	15.54	2.03	0.36	0.07	1.73	0.28	3.01	3.11	100.00	0.7520
24	436	4-252A, T40-7		76.02	14.41	0.69	0.13	0.08	0.53	0.05	4.19	3.90	100.00	0.7501
25	674	TULELAKE-715 (int pum), T59-A3	xx/xx/xx	70.65	15.15	2.69	0.65	0.07	1.97	0.46	4.69	3.68	100.01	0.7493
26	2374	PU-17 T201-2	10/12/89	77.09	13.55	1.31	0.19	0.04	0.84	0.25	3.20	3.53	100.00	0.7489
27	218	MILLVILLE-5, T28-3		75.91	14.43	0.65	0.13	0.11	0.53	0.05	4.25	3.94	100.00	0.7472
28	17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.7469
29	2354	FLV-108-WW T196-2	8/7/89	72.25	14.56	2.54	0.54	0.07	1.68	0.53	4.66	3.18	100.01	0.7465
30	671	TULELAKE-715 (tan pum), T59-A2	xx/xx/xx	70.79	15.00	2.65	0.66	0.08	1.98	0.44	4.79	3.62	100.01	0.7463
31	653	6R008A, T66-1	10/25/83	69.98	15.75	2.74	0.77	0.05	2.82	0.52	3.82	3.54	99.99	0.7441
32	239	OAK RUN-2, T27-6		76.04	14.25	0.64	0.13	0.09	0.54	0.06	4.43	3.82	100.00	0.7437
33	488	758-354H, T16-15, low total		76.93	14.04	1.46	0.03	0.01	0.52	0.10	3.62	3.29	100.00	0.7428
34	2262	T189-1 912-M	5/9/89	72.22	14.03	2.75	0.54	0.03	1.64	0.54	3.79	4.46	100.00	0.7428
35	889	CB-19		74.92	13.02	2.25	0.41	0.03	1.26	0.49	4.11	3.51	100.00	0.7424
36	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.7420
37	1969	WL-4-32 (82.88M) T163-12	5/15/88	68.73	16.19	2.77	0.60	0.10	1.72	0.53	5.15	4.20	99.99	0.7407
38	637	TULELAKE-542, T61-12(2)	08/26/83	77.31	13.35	0.87	0.09	0.05	0.55	0.08	4.17	3.53	100.00	0.7391
39	1968	WL-4-31 (81.15M) T163-11	5/15/88	68.68	16.37	2.78	0.57	0.10	1.62	0.52	5.11	4.26	100.01	0.7374
40	654	57M(1), T55-3 (not orig oxids)	xx/xx/xx	71.59	15.64	2.90	0.71	0.07	2.45	0.44	3.45	2.75	100.00	0.7373
41	1124	T-693 T83-12	10/12/84	71.02	14.62	2.67	0.67	0.06	2.00	0.45	4.83	3.68	100.00	0.7369
42	1289	Tulelake 2382 T100-1	07/02/85	72.17	14.51	2.63	0.49	0.05	1.73	0.47	4.64	3.31	100.00	0.7368
43	211	LOUIS-19, T35-8		75.84	13.05	2.12	0.09	0.02	0.66	0.27	2.63	4.32	99.00	0.7367
44	955	DR-68M		72.31	15.24	2.48	0.57	0.06	1.94	0.47	4.31	2.61	99.99	0.7359
45	7	ASH CREEK-1, T28-1		75.93	14.35	0.63	0.12	0.10	0.54	0.05	3.98	4.30	100.00	0.7348
46	1936	NH-5 T155-8	5/15/88	77.56	13.10	0.75	0.04	0.09	0.47	0.08	4.40	3.51	100.00	0.7345
47	882	CB-8		72.63	14.47	2.41	0.51	0.05	1.80	0.49	4.52	3.11	99.99	0.7341
48	655	57M(2), T59-A4 (not org oxds)	xx/xx/xx	72.15	14.90	2.35	0.53	0.04	1.83	0.44	4.75	3.01	100.00	0.7335
49	1454	RABEK Y8 T115-6	01/27/86	78.73	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.97	100.01	0.7334
50	883	CB-9		72.30	14.54	2.46	0.52	0.05	1.80	0.50	4.71	3.11	99.99	0.7334

V. Listing of 50 closest matches for COMP. NO. 1902 for elements: Na, Al, Si, Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	1.0000
2	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.9722
3	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.9352
4	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9339
5	1927	86LP39, T157-1	03/14/88	76.57	12.90	0.57	0.04	0.08	0.56	0.07	2.47	6.75	100.01	0.9298
6	2120	N-6 T175-10	10/28/88	77.13	13.06	0.92	0.05	0.07	0.52	0.09	2.76	5.39	99.99	0.9292
7	131	GV-78-29, T16-4		76.22	13.26	0.85	0.03	0.00	0.48	0.09	2.70	6.37	100.00	0.9246
8	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.9228
9	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.9213
10	130	GV-78-27, T16-3		76.55	13.38	1.26	0.04	0.00	0.56	0.11	2.72	5.38	100.00	0.9183
11	1497	AMAR-1 T80-1	7/20/84	76.72	12.93	0.77	0.06	0.07	0.49	0.08	2.80	6.08	100.00	0.9176
12	1344	BE-15-A1 T106-6	8/29/85	77.12	12.52	0.82	0.06	0.07	0.48	0.14	2.68	6.11	100.00	0.9174
13	856	LM-10		76.85	12.61	0.97	0.05	0.05	0.51	0.15	2.90	5.90	99.99	0.9151
14	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.9128
15	2276	T191-6 FLV-77-HT	5/10/89	76.97	12.56	0.73	0.05	0.04	0.46	0.11	2.64	6.44	100.00	0.9113
16	2367	PR-77 T197-5	9/14/89	76.95	12.59	0.87	0.04	0.07	0.47	0.09	2.71	6.20	99.99	0.9105
17	134	GV-78-34A, T16-7		77.10	12.88	0.92	0.04	0.05	0.51	0.08	3.04	5.38	100.00	0.9103
18	1863	FLV-34-WW T147-8	9/30/87	76.85	12.93	0.62	0.08	0.06	0.62	0.10	2.52	6.22	100.00	0.9082
19	2356	FLV-110-WW T196-4	8/7/89	77.16	12.22	1.28	0.08	0.03	0.48	0.18	2.74	5.84	100.01	0.9077
20	392	TECO-30G, T17-14		76.75	12.66	1.72	0.03	0.03	0.55	0.13	2.78	5.36	100.01	0.9066
21	120	GV-77-3, T15-11		77.13	12.78	0.91	0.06	0.07	0.52	0.08	3.01	5.44	100.00	0.9060
22	1186	VW-CIMA (2) t89-14	2/28/85	76.59	11.91	1.88	0.06	0.04	0.54	0.17	2.70	6.12	100.01	0.9050
23	127	GV-78-21, T15-15		77.16	12.94	0.92	0.06	0.06	0.52	0.08	3.07	5.18	99.99	0.9046
24	852	LM-5		77.56	12.31	0.76	0.05	0.04	0.56	0.12	2.70	5.90	100.00	0.9039
25	1451	126-1265 t115-13	1/28/86	77.58	12.59	0.89	0.07	0.08	0.44	0.12	2.36	5.87	100.00	0.9027
26	1168	VW-CIMA-1 T87-13	12/24/84	76.79	11.87	1.84	0.06	0.04	0.55	0.19	2.69	5.98	100.01	0.9016
27	235	MV-I, T39-2		76.39	13.20	0.99	0.05	0.06	0.50	0.05	3.15	5.60	99.99	0.9011
28	2352	FLV-75-FC T196-6	8/7/89	77.35	12.69	0.84	0.05	0.03	0.50	0.08	3.06	5.40	100.00	0.9009
29	2141	HPDA-11.06 A 2 sh		76.10	12.95	1.15	0.05	0.03	0.47	0.13	2.87	6.24	99.99	0.9007
30	751	HC-11		77.33	12.22	1.32	0.09	0.04	0.49	0.20	2.90	5.41	100.00	0.8998
31	2073	CCP-C T172-2	9/28/88	77.06	12.19	1.53	0.05	0.02	0.50	0.14	2.09	6.42	100.00	0.8993
32	1921	86LP-38 T154-7	2/24/88	77.15	12.70	0.58	0.05	0.08	0.42	0.09	2.59	6.33	99.99	0.8990
33	2372	083089-A T201-1	10/12/89	76.95	12.15	1.84	0.05	0.03	0.59	0.21	2.60	5.58	100.00	0.8989
34	2204	M86TH-106 T183-3	1/25/89	76.64	11.96	1.79	0.07	0.02	0.56	0.25	2.30	6.39	99.98	0.8979
35	851	LM-4		76.91	12.63	1.19	0.02	0.03	0.49	0.10	3.01	5.62	100.00	0.8979
36	2200	FLV-116-WW T182-7	1/24/89	76.89	12.40	1.31	0.09	0.02	0.49	0.21	2.96	5.63	100.00	0.8977
37	849	LM-2		77.99	12.51	0.74	0.06	0.03	0.56	0.10	2.80	5.21	100.00	0.8975
38	2281	T190-5 FLV-121-WW	5/10/89	76.61	12.95	0.65	0.04	0.06	0.57	0.07	2.85	6.20	100.00	0.8972
39	2373	08309-A (2) T201-1	10/13/89	77.05	12.20	1.84	0.05	0.03	0.62	0.19	2.46	5.55	99.99	0.8971
40	1840	FLV-16-WW T146-4	8/25/87	77.22	12.84	0.75	0.07	0.05	0.49	0.10	3.09	5.39	100.00	0.8969
41	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.8965
42	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.8959
43	2232	FLV-112-WW DARK T185-5	2/28/89	77.20	12.47	0.81	0.04	0.04	0.49	0.08	3.04	5.82	99.99	0.8943
44	2236	FLV-118-WW DARK T186-1	2/28/89	77.07	12.70	0.81	0.04	0.04	0.50	0.10	3.17	5.57	100.00	0.8940
45	1439	2011854 T114-8	12/12/85	76.98	12.35	1.51	0.02	0.05	0.51	0.11	3.16	5.31	100.00	0.8937
46	2199	FLV-115-WW T182-6	1/24/89	77.09	12.37	1.27	0.08	0.01	0.47	0.19	2.89	5.63	100.00	0.8931
47	1862	FLV-33-WW T147-7	9/30/87	76.87	12.95	0.64	0.07	0.07	0.62	0.12	2.69	5.96	99.99	0.8930
48	2230	FLV-111-WW T185-3	2/28/89	76.95	12.50	0.82	0.02	0.08	0.46	0.06	2.87	6.23	99.99	0.8914
49	1443	03068506B SILICIC FR. T114-12	12/12/85	77.56	12.63	0.71	0.05	0.07	0.51	0.10	3.27	5.09	99.99	0.8911
50	1854	FLV-25-WW T147-1	9/30/87	77.60	12.45	0.61	0.07	0.07	0.56	0.10	2.89	5.66	100.01	0.8908

Listing of 50 closest matches for COMP. NO. 1902 for elements: Na, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total.R	Sim. Co
1	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	1.0000
2	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.9726
3	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9382
4	488	758-354H, T16-15, low total		76.93	14.04	1.46	0.03	0.01	0.52	0.10	3.62	3.29	100.00	0.9044
5	1740	BRICE-2 T-136-7	4/22/87	77.25	13.45	1.26	0.15	0.08	0.56	0.21	3.59	3.47	100.02	0.8904
6	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.8832
7	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.8817
8	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8775
9	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8765
10	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8765
11	1538	PICO 82 T124-9	5/5/86	79.30	13.14	0.67	0.06	0.04	0.71	0.08	2.78	3.22	100.00	0.8733
12	209	LOCK-4, T41-3		77.42	13.05	0.88	0.05	0.04	0.50	0.10	4.52	3.45	100.01	0.8714
13	2120	N-6 T175-10	10/28/88	77.13	13.06	0.92	0.05	0.07	0.52	0.09	2.76	5.39	99.99	0.8707
14	208	LOCK-3, T41-2		77.38	13.02	0.83	0.06	0.05	0.52	0.12	4.57	3.45	100.00	0.8700
15	668	CAPIS-1, T54-1	xx/xx/xx	78.43	12.27	1.29	0.08	0.04	0.48	0.18	3.05	4.17	99.99	0.8698
16	637	TULELAKE-542, T61-12(2)	08/26/83	77.31	13.35	0.87	0.09	0.05	0.55	0.08	4.17	3.53	100.00	0.8697
17	207	LOCK-2, T-41-1		77.79	12.94	0.85	0.05	0.05	0.51	0.08	4.42	3.30	99.99	0.8691
18	436	4-252A, T40-7		76.02	14.41	0.69	0.13	0.08	0.53	0.05	4.19	3.90	100.00	0.8684
19	211	LOUIS-19, T35-8		75.84	13.05	2.12	0.09	0.02	0.66	0.27	2.63	4.32	99.00	0.8660
20	17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.8651
21	218	MILLVILLE-5, T28-3		75.91	14.43	0.65	0.13	0.11	0.53	0.05	4.25	3.94	100.00	0.8649
22	1454	RABEK Y8 T115-6	01/27/86	78.73	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.97	100.01	0.8635
23	1470	RABEK Y8 T115-6 CORR K	1/27/86	78.72	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.98	100.01	0.8631
24	2140	FL86C-5.41 C 2 sh		78.26	12.59	1.01	0.08	0.07	0.55	0.04	3.70	3.72	100.02	0.8628
25	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.8623
26	130	GV-78-27, T16-3		76.55	13.38	1.26	0.04	0.00	0.56	0.11	2.72	5.38	100.00	0.8621
27	1542	CHV-3 T124-13	5/5/86	77.65	12.33	1.58	0.03	0.03	0.53	0.13	4.12	3.60	100.00	0.8604
28	239	OAK RUN-2, T27-6		76.04	14.25	0.64	0.13	0.09	0.54	0.06	4.43	3.82	100.00	0.8601
29	1936	NH-5 T155-8	5/15/88	77.56	13.10	0.75	0.04	0.09	0.47	0.08	4.40	3.51	100.00	0.8596
30	1450	126-1254 t115-12	1/28/85	77.26	12.70	0.91	0.08	0.08	0.48	0.14	2.67	5.68	100.00	0.8578
31	1106	61384-34 ASW T82-7	10/11/84	78.09	12.58	0.73	0.08	0.05	0.51	0.10	3.70	4.17	100.01	0.8577
32	598	SM-ASH-34, T56-7	07/01/83	77.08	13.59	0.54	0.10	0.06	0.54	0.08	3.95	4.07	100.01	0.8570
33	127	GV-78-21, T15-15		77.16	12.94	0.92	0.06	0.06	0.52	0.08	3.07	5.18	99.99	0.8561
34	134	GV-78-34A, T16-7		77.10	12.88	0.92	0.04	0.05	0.51	0.08	3.04	5.38	100.00	0.8557
35	2131	CCPC-5.36 A lsh		78.14	12.58	1.01	0.06	0.06	0.56	0.09	3.62	3.87	99.99	0.8555
36	1739	BRICE-1 T-136-6	4/22/87	77.88	12.55	1.05	0.07	0.06	0.53	0.09	3.73	4.04	100.00	0.8545
37	7	ASH CREEK-1, T28-1		75.93	14.35	0.63	0.12	0.10	0.54	0.05	3.98	4.30	100.00	0.8537
38	1118	61484-47 ASW T83-6	10/12/84	77.53	12.96	0.83	0.10	0.05	0.57	0.08	4.38	3.50	100.00	0.8535
39	392	TECO-30G, T17-14		76.75	12.66	1.72	0.03	0.03	0.55	0.13	2.78	5.36	100.01	0.8533
40	2321	NAP-1L T193-2	6/1/89	78.32	12.39	0.73	0.10	0.05	0.53	0.09	3.20	4.59	100.00	0.8531
41	636	TULELAKE-542, T61-12(1)	08/17/83	77.08	13.15	0.90	0.10	0.06	0.56	0.06	4.56	3.55	100.02	0.8524
42	2147	SAFZ-5, T167-8, lo Ca 10sh		77.15	13.53	0.55	0.05	0.09	0.58	0.08	4.35	3.64	100.02	0.8517
43	120	GV-77-3, T15-11		77.13	12.78	0.91	0.06	0.07	0.52	0.08	3.01	5.44	100.00	0.8509
44	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.8499
45	1145	15-VI-84-7 T85-7 lt col. fra	12/4/84	77.41	12.97	0.86	0.10	0.06	0.58	0.09	4.40	3.51	99.98	0.8498
46	1165	ALT 3 T87-2	12/24/84	77.77	12.68	0.63	0.09	0.05	0.51	0.10	3.87	4.28	99.98	0.8497
47	849	LM-2		77.99	12.51	0.74	0.06	0.03	0.56	0.10	2.80	5.21	100.00	0.8496
48	336	SALTON-1, T20-3		77.94	12.65	0.76	0.02	0.03	0.48	0.05	4.47	3.61	100.01	0.8496
49	1844	FLV-19-WW T146-7	8/25/87	77.31	13.24	0.72	0.04	0.08	0.48	0.06	3.76	4.31	100.00	0.8489
50	625	TULELAKE-315, T63-7	09/02/83	77.88	12.39	1.20	0.02	0.04	0.53	0.07	3.76	4.11	100.00	0.8485

Listing of 50 closest matches for COMP. NO. 1902 for elements: Na, Al, Si, K , Ca, Fe Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total.R	Sim. Co
1	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	1.0000
2	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9985
3	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.9983
4	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.9834
5	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.9239
6	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.9156
7	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.9156
8	115	GV-76-8, T16-12		78.03	12.88	0.46	0.03	0.03	0.45	0.11	2.48	5.53	100.00	0.9019
9	1454	RABEK Y8 T115-6	01/27/86	78.73	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.97	100.01	0.7868
10	1470	RABEK Y8 T115-6 CORR K	1/27/86	78.72	12.90	0.57	0.09	0.07	0.63	0.08	2.97	3.98	100.01	0.7865
11	598	SM-ASH-34, T56-7	07/01/83	77.08	13.59	0.54	0.10	0.06	0.54	0.08	3.95	4.07	100.01	0.7851
12	1538	PICO 82 T124-9	5/5/86	79.30	13.14	0.67	0.06	0.04	0.71	0.08	2.78	3.22	100.00	0.7850
13	1453	LOS CHOCOYOS SC-7 T116-3	01/28/86	78.24	12.84	0.44	0.11	0.09	0.65	0.10	3.36	4.16	99.99	0.7801
14	488	758-354H, T16-15, low total		76.93	14.04	1.46	0.03	0.01	0.52	0.10	3.62	3.29	100.00	0.7799
15	17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.7799
16	218	MILLVILLE-5, T28-3		75.91	14.43	0.65	0.13	0.11	0.53	0.05	4.25	3.94	100.00	0.7797
17	2147	SAFZ-5, T167-8, lo Ca 10mh		77.15	13.53	0.55	0.05	0.09	0.58	0.08	4.35	3.64	100.02	0.7794
18	436	4-252A, T40-7		76.02	14.41	0.69	0.13	0.08	0.53	0.05	4.19	3.90	100.00	0.7792
19	239	OAK RUN-2, T27-6		76.04	14.25	0.64	0.13	0.09	0.54	0.06	4.43	3.82	100.00	0.7766
20	1740	BRICE-2 T-136-7	4/22/87	77.25	13.45	1.26	0.15	0.08	0.56	0.21	3.59	3.47	100.02	0.7725
21	7	ASH CREEK-1, T28-1		75.93	14.35	0.63	0.12	0.10	0.54	0.05	3.98	4.30	100.00	0.7723
22	1927	86LP39, T157-1	03/14/88	76.57	12.90	0.57	0.04	0.08	0.56	0.07	2.47	6.75	100.01	0.7718
23	208	LOCK-3, T41-2		77.38	13.02	0.83	0.06	0.05	0.52	0.12	4.57	3.45	100.00	0.7712
24	209	LOCK-4, T41-3		77.42	13.05	0.88	0.05	0.04	0.50	0.10	4.52	3.45	100.01	0.7698
25	1882	FLV-38-WW T147-12	9/30/87	79.16	12.71	0.54	0.05	0.08	0.42	0.10	2.15	4.79	100.00	0.7695
26	207	LOCK-2, T-41-1		77.79	12.94	0.85	0.05	0.05	0.51	0.08	4.42	3.30	99.99	0.7693
27	1165	ALT 3 T87-2	12/24/84	77.77	12.68	0.63	0.09	0.05	0.51	0.10	3.87	4.28	99.98	0.7689
28	637	TULELAKE-542, T61-12(2)	08/26/83	77.31	13.35	0.87	0.09	0.05	0.55	0.08	4.17	3.53	100.00	0.7688
29	2126	CRAW-88-3H T176-5	10/27/88	76.92	13.24	0.61	0.04	0.11	0.51	0.06	4.09	4.41	99.99	0.7677
30	1936	NH-5 T155-8	5/15/88	77.56	13.10	0.75	0.04	0.09	0.47	0.08	4.40	3.51	100.00	0.7674
31	1106	61384-34 ASW T82-7	10/11/84	78.09	12.58	0.73	0.08	0.05	0.51	0.10	3.70	4.17	100.01	0.7673
32	2120	N-6 T175-10	10/28/88	77.13	13.06	0.92	0.05	0.07	0.52	0.09	2.76	5.39	99.99	0.7672
33	1174	ALT-4 t89-1	3/1/85	77.64	12.84	0.64	0.08	0.05	0.50	0.10	3.86	4.28	99.99	0.7669
34	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.7650
35	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	0.7643
36	2321	NAP-1L T193-2	6/1/89	78.32	12.39	0.73	0.10	0.05	0.53	0.09	3.20	4.59	100.00	0.7635
37	1164	ALT 2A T87-1	12/24/84	77.89	12.55	0.65	0.08	0.05	0.50	0.10	3.91	4.27	100.00	0.7613
38	66	D77-27B, T30-4		77.05	13.00	0.58	0.04	0.04	0.53	0.09	3.45	5.22	100.00	0.7611
39	1844	FLV-19-WW T146-7	8/25/87	77.31	13.24	0.72	0.04	0.08	0.48	0.06	3.76	4.31	100.00	0.7607
40	68	DSDP-1, T9-3, low total		75.79	14.88	0.11	0.49	0.01	0.96	0.01	2.43	5.32	100.00	0.7605
41	1443	03068506B SILICIC FR. T114-12	12/12/85	77.56	12.63	0.71	0.05	0.07	0.51	0.10	3.27	5.09	99.99	0.7604
42	1442	03068506A SILICIC FR. T114-1	12/12/85	77.71	12.67	0.74	0.04	0.08	0.49	0.07	3.04	5.15	99.99	0.7601
43	849	LM-2		77.99	12.51	0.74	0.06	0.03	0.56	0.10	2.80	5.21	100.00	0.7598
44	338	SALTON-2A, T20-4		77.84	12.72	0.69	0.03	0.01	0.48	0.07	4.41	3.75	100.00	0.7598
45	1863	FLV-34-WW T147-8	9/30/87	76.85	12.93	0.62	0.08	0.06	0.62	0.10	2.52	6.22	100.00	0.7592
46	1864	FLV-35-WW T147-9	9/30/87	77.58	12.69	0.60	0.06	0.07	0.49	0.10	3.76	4.65	100.00	0.7584
47	336	SALTON-1, T20-3		77.94	12.65	0.76	0.02	0.03	0.48	0.05	4.47	3.61	100.01	0.7584
48	1683	MRSN-1 T134-4	11/25/86	77.63	12.49	0.61	0.07	0.07	0.49	0.09	3.21	5.35	100.01	0.7580
49	1854	FLV-25-WW T147-1	9/30/87	77.60	12.45	0.61	0.07	0.07	0.56	0.10	2.89	5.66	100.01	0.7577
50	1118	61484-47 ASW T83-6	10/12/84	77.53	12.96	0.83	0.10	0.05	0.57	0.08	4.38	3.50	100.00	0.7575

Listing of 50 closest matches for COMP. NO. 1902 for elements: Na, Mg, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	1.0000
2	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.9489
3	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9002
4	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8737
5	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	0.8737
6	68	DSDP-1, T9-3, low total		75.79	14.88	0.11	0.49	0.01	0.96	0.01	2.43	5.32	100.00	0.8475
7	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8463
8	1740	BRICE-2 T-136-7	4/22/87	77.25	13.45	1.26	0.15	0.08	0.56	0.21	3.59	3.47	100.02	0.7931
9	1898	E67-113 1543 T151-1	11/10/87	74.47	17.18	0.10	0.85	0.01	0.28	0.03	2.46	4.64	100.02	0.7879
10	869	LM-25		73.87	15.54	2.03	0.36	0.07	1.73	0.28	3.01	3.11	100.00	0.7856
11	1152	11-IV-84-0 T86-6	12/4/84	71.71	14.91	2.26	0.51	0.09	1.50	0.50	5.05	3.46	99.99	0.7779
12	1289	Tulelake 2382 T100-1	07/02/85	72.17	14.51	2.63	0.49	0.05	1.73	0.47	4.64	3.31	100.00	0.7765
13	1427	ASW-6985-2 T103-2 Bel	08/26/85	71.17	15.46	2.49	0.53	0.07	1.69	0.42	4.77	3.40	100.00	0.7750
14	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.7721
15	889	CB-19		74.92	13.02	2.25	0.41	0.03	1.26	0.49	4.11	3.51	100.00	0.7712
16	2374	PU-17 T201-2	10/12/89	77.09	13.55	1.31	0.19	0.04	0.84	0.25	3.20	3.53	100.00	0.7683
17	436	4-252A, T40-7		76.02	14.41	0.69	0.13	0.08	0.53	0.05	4.19	3.90	100.00	0.7679
18	1060	SW-C T76-8	7/28/84	72.85	14.66	1.98	0.42	0.07	1.61	0.41	4.56	3.43	99.99	0.7668
19	17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.7651
20	1602	MOD-16 T130-12	9/19/86	72.88	13.84	2.42	0.50	0.08	1.52	0.54	4.97	3.24	99.99	0.7650
21	218	MILLVILLE-5, T28-3		75.91	14.43	0.65	0.13	0.11	0.53	0.05	4.25	3.94	100.00	0.7650
22	1598	MOD-12 T130-8	9/19/86	72.25	14.12	2.30	0.47	0.11	1.15	0.53	5.00	4.06	99.99	0.7640
23	488	758-354H, T16-15, low total		76.93	14.04	1.46	0.03	0.01	0.52	0.10	3.62	3.29	100.00	0.7638
24	1674	PAOH-3(A) T132-15	10/21/86	73.84	13.96	2.26	0.45	0.04	2.10	0.28	3.89	3.19	100.01	0.7634
25	833	GS-78		70.05	15.05	3.43	0.50	0.07	1.68	0.49	5.42	3.31	100.00	0.7629
26	881	CB-7		72.38	14.56	2.49	0.50	0.05	1.80	0.49	4.62	3.11	100.00	0.7629
27	1413	MADRAS T112-4	10/22/85	73.18	15.21	2.63	0.44	0.07	1.87	0.37	3.55	2.69	100.01	0.7628
28	813	GS-57		72.38	14.74	2.38	0.49	0.03	1.77	0.49	4.71	3.01	100.00	0.7624
29	882	CB-8		72.63	14.47	2.41	0.51	0.05	1.80	0.49	4.52	3.11	99.99	0.7613
30	239	OAK RUN-2, T27-6		76.04	14.25	0.64	0.13	0.09	0.54	0.06	4.43	3.82	100.00	0.7610
31	887	CB-15		72.90	14.44	2.18	0.41	0.04	1.57	0.44	4.61	3.41	100.00	0.7606
32	1563	WA 9-F T127-6	7/18/86	75.57	12.38	1.43	0.49	0.04	1.49	2.17	3.74	2.69	100.00	0.7604
33	1842	FLV-17-WW T146-5	8/25/87	71.88	15.85	2.30	0.60	0.05	2.15	0.29	3.72	3.15	99.99	0.7599
34	1461	FABY 37 T115-2	1/27/86	77.50	13.01	1.32	0.07	0.04	0.49	0.12	2.37	5.08	100.00	0.7598
35	1222	CRL-9 T88-12	5/2/85	72.29	14.33	2.51	0.51	0.06	1.74	0.45	4.88	3.22	99.99	0.7592
36	319	RBW-80-133C, MSH6-1		72.70	15.16	2.26	0.50	0.03	1.97	0.35	4.23	2.80	100.00	0.7591
37	951	DR-63		74.27	13.93	2.16	0.48	0.04	1.87	0.43	4.01	2.81	100.00	0.7575
38	862	LM-18		75.67	14.65	1.21	0.24	0.06	1.61	0.13	3.01	3.41	99.99	0.7575
39	2033	PF-88-E T169-2	10/2/88	73.41	14.61	2.14	0.43	0.04	2.06	0.26	3.95	3.10	100.00	0.7574
40	1554	SIMP-3 T126-10	7/17/86	77.19	13.50	1.59	0.17	0.04	0.85	0.20	3.19	3.26	99.99	0.7568
41	2354	FLV-108-WW T196-2	8/7/89	72.25	14.56	2.54	0.54	0.07	1.68	0.53	4.66	3.18	100.01	0.7565
42	834	GS-79		70.22	14.85	3.49	0.50	0.09	1.63	0.50	5.52	3.21	100.01	0.7565
43	1374	B7-1/2-TM1-Z3 T104-3	8/26/85	74.24	13.05	2.41	0.43	0.02	1.51	0.64	3.43	4.29	100.02	0.7561
44	1068	324-M-RT T76-2	7/28/84	71.86	14.99	2.43	0.49	0.10	1.96	0.44	4.77	2.96	100.00	0.7557
45	765	GS-4		75.48	14.53	2.22	0.24	0.05	1.37	0.29	2.81	3.01	100.00	0.7554
46	1376	ASW-61085-15 T108-2	9/23/85	77.68	12.49	0.98	0.30	0.03	0.96	0.14	3.75	3.68	100.01	0.7554
47	637	TULELAKE-542, T61-12(2)	08/26/83	77.31	13.35	0.87	0.09	0.05	0.55	0.08	4.17	3.53	100.00	0.7553
48	1536	M7810 T124-7	5/5/86	73.36	14.56	2.19	0.44	0.03	2.08	0.26	4.03	3.05	100.00	0.7552
49	1515	MOD-4 (2) (373) T119-14	4/28/86	74.85	14.90	1.26	0.39	0.12	1.86	0.12	3.59	2.90	99.99	0.7552
50	883	CB-9		72.30	14.54	2.46	0.52	0.05	1.80	0.50	4.71	3.11	99.99	0.7545

VI. Listing of 50 closest matches for COMP. NO. 1901 for elements: Na, Al, Si, Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total	R	Sim. Co
1	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00		1.0000
2	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00		1.0000
3	2251	T187-6 103-M	5/9/89	76.09	13.16	0.96	0.02	0.03	0.41	0.06	3.57	5.69	99.99		0.9469
4	201	LD-70, T3,4		77.22	12.91	0.79	0.04	0.04	0.43	0.07	3.58	4.93	100.01		0.9402
5	41	BT-11D2, T13-13		77.17	13.13	0.76	0.02	0.04	0.42	0.05	3.73	4.66	99.98		0.9395
6	719	LD-70		77.20	12.92	0.79	0.04	0.04	0.43	0.07	3.60	4.91	100.00		0.9390
7	293	PICO-141, T39-7		77.29	12.84	0.73	0.03	0.02	0.42	0.07	3.68	4.91	99.99		0.9379
8	1897	YJC-4-87 T150-14	11/9/87	77.17	12.92	0.56	0.04	0.10	0.42	0.07	3.45	5.28	100.01		0.9373
9	2004	FLV-54-CS T166-4	19-JUL-8	77.24	12.73	0.77	0.03	0.05	0.41	0.07	3.58	5.12	100.00		0.9372
10	29	BT-1C, T13-5		77.84	12.73	0.77	0.03	0.05	0.42	0.06	3.52	4.57	99.99		0.9371
11	377	TECO-10, T17-1		76.77	13.09	0.78	0.04	0.03	0.42	0.08	3.78	5.01	100.00		0.9370
12	2006	FLV-56-CS T166-6	7/19/88	77.18	12.83	0.77	0.04	0.06	0.42	0.06	3.72	4.92	100.00		0.9355
13	375	TECO-7, T14-2		77.09	12.90	0.81	0.03	0.05	0.42	0.06	3.75	4.89	100.00		0.9349
14	2005	FLV-55-CS T166-5	7/19/88	77.07	12.89	0.73	0.03	0.07	0.41	0.07	3.66	5.07	100.00		0.9348
15	268	PICO-14, T1, N-ASW-64, P		77.15	12.67	0.83	0.04	0.10	0.43	0.07	3.55	5.16	100.00		0.9346
16	380	TECO-24, T17-3		76.58	13.07	0.76	0.03	0.03	0.44	0.07	3.65	5.37	100.00		0.9344
17	2375	FLV-136-WP T201-3	10/12/89	77.63	12.74	0.72	0.03	0.03	0.43	0.05	3.61	4.75	99.99		0.9342
18	1940	AV12.1-T3 T154-14	4/30/88	76.78	12.47	1.48	0.03	0.03	0.43	0.12	3.60	5.07	100.01		0.9334
19	38	BT-11C1, T13-10		77.71	12.59	0.72	0.03	0.04	0.42	0.06	3.67	4.76	100.00		0.9334
20	25	BROAD-1, T41-6		76.84	13.16	0.74	0.04	0.06	0.45	0.07	3.56	5.08	100.00		0.9331
21	1865	FLV-36-WW T147-10	9/30/87	77.47	12.83	0.58	0.05	0.09	0.43	0.11	3.66	4.76	99.98		0.9327
22	27	BT-1A, T13-3		77.53	12.65	0.74	0.03	0.04	0.42	0.06	3.71	4.81	99.99		0.9322
23	1772	IHO51A T141-14	5/27/87	77.84	12.60	0.72	0.05	0.04	0.43	0.08	3.62	4.62	100.00		0.9307
24	1166	WEB-1 T87-11	12/24/84	77.26	12.68	0.76	0.04	0.05	0.41	0.06	3.67	5.09	100.02		0.9302
25	2194	FLV-65-MA T182-1	1/24/89	77.63	12.95	0.70	0.02	0.02	0.43	0.06	3.72	4.45	99.98		0.9301
26	288	PICO-108, T39-5		77.01	12.81	0.73	0.03	0.04	0.42	0.07	3.81	5.07	99.99		0.9300
27	663	BT-2, T62-15	08/26/83	77.64	12.67	0.74	0.03	0.03	0.43	0.07	3.66	4.73	100.00		0.9297
28	1167	WEB-3 T87-12	12/24/84	77.41	12.52	0.76	0.04	0.05	0.41	0.06	3.52	5.21	99.98		0.9292
29	2062	FLV-63-CS T170-8	9/3/88	76.87	12.94	0.58	0.04	0.09	0.43	0.06	3.77	5.23	100.01		0.9292
30	34	BT-11A1, T13-6		77.55	12.72	0.69	0.03	0.04	0.43	0.06	3.69	4.78	99.99		0.9288
31	1732	CMT-3 T137-13	4/21/87	77.55	12.62	0.75	0.05	0.05	0.41	0.06	3.67	4.86	100.02		0.9284
32	295	PICO-152, T39-1		76.98	12.97	0.79	0.03	0.06	0.42	0.05	3.89	4.80	99.99		0.9278
33	384	TECO-29, T17-6		76.68	13.12	0.81	0.04	0.04	0.43	0.07	3.85	4.96	100.00		0.9277
34	387	TECO-30B-2, T17-9		76.88	13.08	0.74	0.03	0.04	0.44	0.07	3.75	4.98	100.01		0.9271
35	382	TECO-28A, T17-4		76.74	13.09	0.81	0.03	0.04	0.43	0.06	3.85	4.94	99.99		0.9270
36	953	DR-66		77.71	12.70	0.73	0.03	0.04	0.42	0.07	3.80	4.50	100.00		0.9267
37	294	PICO-143, T36-4		76.45	12.91	0.76	0.04	0.01	0.42	0.06	3.93	4.43	99.01		0.9262
38	374	TECO-6, T14-1		77.47	12.84	0.73	0.03	0.04	0.41	0.05	3.76	4.67	100.00		0.9262
39	383	TECO-28B, T17-5		77.00	12.89	0.75	0.04	0.03	0.43	0.06	3.80	5.00	100.00		0.9261
40	1730	WEB-2 T137-11	4/21/87	77.44	12.50	0.80	0.05	0.06	0.43	0.04	3.69	4.99	100.00		0.9257
41	2278	T191-8 FLV-80-HT	5/10/89	74.55	13.45	1.17	0.07	0.10	0.37	0.19	3.58	6.52	100.00		0.9253
42	271	PICO-23, T2-11		77.28	12.87	0.77	0.04	0.05	0.42	0.07	3.89	4.61	100.00		0.9253
43	40	BT-11D1, T13-12		77.47	12.75	0.74	0.03	0.04	0.41	0.04	3.76	4.76	100.00		0.9248
44	1304	CF-2 SILICIC FRACT. BULK T100	7/2/85	77.27	12.67	0.76	0.05	0.07	0.45	0.11	3.59	5.05	100.02		0.9248
45	662	BT-1C, T62-10	08/26/83	77.47	12.75	0.73	0.03	0.03	0.43	0.07	3.77	4.72	100.00		0.9243
46	442	63CJ-26(1), T1, N-ASW-2, P		77.37	12.69	0.73	0.04	0.05	0.45	0.08	3.60	4.99	100.00		0.9241
47	30	BT-2, T1, N-ASW-55, P		77.95	12.25	0.71	0.03	0.05	0.41	0.06	3.53	5.00	99.99		0.9240
48	1032	FRIANT 12A T74-6	6/22/84	77.31	12.55	0.67	0.04	0.00	0.44	0.06	3.65	5.29	100.01		0.9240
49	1894	YJC-1-87 T150-11	11/9/87	77.28	12.91	0.73	0.04	0.05	0.44	0.07	3.74	4.75	100.01		0.9238
50	2007	FLV-57-CS T166-7	7/19/88	77.34	12.71	0.69	0.02	0.04	0.44	0.07	3.69	4.98	99.98		0.9237

Listing of 50 closest matches for COMP. NO. 1901 for elements: Na, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	1.0000
2	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	1.0000
3	488	758-354H, T16-15, low total		76.93	14.04	1.46	0.03	0.01	0.52	0.10	3.62	3.29	100.00	0.9206
4	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.9080
5	1747	K87-74 T136-14	4/22/87	78.43	12.78	0.66	0.07	0.06	0.42	0.10	4.53	2.94	99.99	0.8987
6	1740	BRICE-2 T-136-7	4/22/87	77.25	13.45	1.26	0.15	0.08	0.56	0.21	3.59	3.47	100.02	0.8927
7	2013	SAFZ-2 T167-5	7/19/88	77.75	12.93	0.60	0.05	0.06	0.42	0.12	4.35	3.72	100.00	0.8881
8	281	PICO-76, T36-6		76.92	12.92	0.76	0.03	0.05	0.40	0.05	4.16	3.72	99.01	0.8880
9	280	PICO-74, T36-5		76.55	12.99	0.74	0.03	0.04	0.42	0.07	4.12	4.05	99.01	0.8874
10	29	BT-1C, T13-5		77.84	12.73	0.77	0.03	0.05	0.42	0.06	3.52	4.57	99.99	0.8862
11	275	PICO-40A, T8-7		77.94	12.89	0.81	0.04	0.03	0.45	0.05	3.82	3.97	100.00	0.8860
12	41	BT-11D2, T13-13		77.17	13.13	0.76	0.02	0.04	0.42	0.05	3.73	4.66	99.98	0.8855
13	2194	FLV-65-MA T182-1	1/24/89	77.63	12.95	0.70	0.02	0.02	0.43	0.06	3.72	4.45	99.98	0.8843
14	1744	J82-22-3 T-136-11	4/22/87	78.75	12.53	0.63	0.06	0.06	0.41	0.08	4.59	2.88	99.99	0.8841
15	294	PICO-143, T36-4		76.45	12.91	0.76	0.04	0.01	0.42	0.06	3.93	4.43	99.01	0.8818
16	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.8817
17	284	PICO-78(3), T36-7		76.59	12.86	0.72	0.04	0.04	0.42	0.05	4.13	4.16	99.01	0.8812
18	2015	SAFZ-4 T167-7	7/19/88	78.08	12.91	0.57	0.05	0.08	0.37	0.09	4.66	3.19	100.00	0.8801
19	953	DR-66		77.71	12.70	0.73	0.03	0.04	0.42	0.07	3.80	4.50	100.00	0.8801
20	1772	IH051A T141-14	5/27/87	77.84	12.60	0.72	0.05	0.04	0.43	0.08	3.62	4.62	100.00	0.8796
21	201	LD-70, T3,4		77.22	12.91	0.79	0.04	0.04	0.43	0.07	3.58	4.93	100.01	0.8787
22	2375	FLV-136-WP T201-3	10/12/89	77.63	12.74	0.72	0.03	0.03	0.43	0.05	3.61	4.75	99.99	0.8787
23	719	LD-70		77.20	12.92	0.79	0.04	0.04	0.43	0.07	3.60	4.91	100.00	0.8783
24	38	BT-11C1, T13-10		77.71	12.59	0.72	0.03	0.04	0.42	0.06	3.67	4.76	100.00	0.8778
25	1936	NH-5 T155-8	5/15/88	77.56	13.10	0.75	0.04	0.09	0.47	0.08	4.40	3.51	100.00	0.8775
26	276	PICO-41A, T8-8		77.38	12.94	0.73	0.03	0.05	0.42	0.04	4.01	4.39	99.99	0.8775
27	293	PICO-141, T39-7		77.29	12.84	0.73	0.03	0.02	0.42	0.07	3.68	4.91	99.99	0.8774
28	1865	FLV-36-WW T147-10	9/30/87	77.47	12.83	0.58	0.05	0.09	0.43	0.11	3.66	4.76	99.98	0.8773
29	2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.8772
30	2129	CCPC-5.36 lo Fe av. 8		78.80	12.84	0.60	0.05	0.07	0.39	0.08	4.42	2.76	100.01	0.8766
31	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.8765
32	890	CB-25		77.97	11.42	1.78	0.13	0.03	0.44	0.51	3.71	4.01	100.00	0.8759
33	2320	IH8907A T193-1	6/1/89	78.35	12.32	0.75	0.04	0.02	0.43	0.05	4.37	3.67	100.00	0.8759
34	663	BT-2, T62-15	08/26/83	77.64	12.67	0.74	0.03	0.03	0.43	0.07	3.66	4.73	100.00	0.8757
35	271	PICO-23, T2-11		77.28	12.87	0.77	0.04	0.05	0.42	0.07	3.89	4.61	100.00	0.8756
36	375	TECO-7, T14-2		77.09	12.90	0.81	0.03	0.05	0.42	0.06	3.75	4.89	100.00	0.8756
37	254	P-100, T22-4		77.78	12.86	0.75	0.03	0.05	0.45	0.06	4.27	3.75	100.00	0.8755
38	27	BT-1A, T13-3		77.53	12.65	0.74	0.03	0.04	0.42	0.06	3.71	4.81	99.99	0.8755
39	2006	FLV-56-CS T166-6	7/19/88	77.18	12.83	0.77	0.04	0.06	0.42	0.06	3.72	4.92	100.00	0.8752
40	2136	FL86C-5.41 lo Fe lo Ca 3 sh		78.83	12.71	0.59	0.04	0.05	0.40	0.05	4.55	2.76	99.98	0.8751
41	2228	FLV-66-MA T185-1	2/28/89	77.74	12.66	0.75	0.02	0.04	0.43	0.07	3.79	4.51	100.01	0.8750
42	374	TECO-6, T14-1		77.47	12.84	0.73	0.03	0.04	0.41	0.05	3.76	4.67	100.00	0.8746
43	26	BT-1, T2-13		77.32	12.91	0.80	0.03	0.03	0.43	0.05	3.85	4.57	99.99	0.8744
44	2072	ARCH-88-1 T172-1	9/28/88	77.66	12.73	0.74	0.04	0.03	0.43	0.07	3.87	4.44	100.01	0.8744
45	377	TECO-10, T17-1		76.77	13.09	0.78	0.04	0.03	0.42	0.08	3.78	5.01	100.00	0.8742
46	277	PICO-43, T36-3		76.85	12.90	0.73	0.03	0.03	0.47	0.05	3.93	4.02	99.01	0.8738
47	34	BT-11A1, T13-6		77.55	12.72	0.69	0.03	0.04	0.43	0.06	3.69	4.78	99.99	0.8735
48	1745	J82-22-4 T-136-12	4/22/87	78.84	12.58	0.60	0.06	0.07	0.39	0.10	4.54	2.82	100.00	0.8729
49	2146	HPDA-11.06 loFe,Ca 4sh		78.27	12.98	0.58	0.04	0.07	0.36	0.08	4.63	2.99	100.00	0.8728
50	337	SALTON-2, T2-14		77.55	12.98	0.76	0.04	0.05	0.46	0.07	4.48	3.60	99.99	0.8726

Listing of 50 closest matches for COMP. NO. 1901 for elements: Na, Al, Si, K , Ca, Fe Date of Update: 2/12/90

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total,R	Sim. Co
1 1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	1.0000
2 2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	1.0000
3 2376	FLV-148-CS T201-4	10/12/89	77.47	13.76	0.43	0.11	0.00	0.51	0.05	3.51	4.17	100.01	0.8903
4 2013	SAFZ-2 T167-5	7/19/88	77.75	12.93	0.60	0.05	0.06	0.42	0.12	4.35	3.72	100.00	0.8651
5 2015	SAFZ-4 T167-7	7/19/88	78.08	12.91	0.57	0.05	0.08	0.37	0.09	4.66	3.19	100.00	0.8650
6 1747	K87-74 T136-14	4/22/87	78.43	12.78	0.66	0.07	0.06	0.42	0.10	4.53	2.94	99.99	0.8625
7 1865	FLV-36-WW T147-10	9/30/87	77.47	12.83	0.58	0.05	0.09	0.43	0.11	3.66	4.76	99.98	0.8604
8 1251	TLN-3 T96-10	5/29/85	77.20	12.87	0.54	0.04	0.09	0.43	0.09	4.03	4.70	99.99	0.8573
9 1897	YJC-4-87 T150-14	11/9/87	77.17	12.92	0.56	0.04	0.10	0.42	0.07	3.45	5.28	100.01	0.8573
10 2146	HPDA-11.06 loFe,Ca 4sh		78.27	12.98	0.58	0.04	0.07	0.36	0.08	4.63	2.99	100.00	0.8566
11 2136	FL86C-5.41 lo Fe lo Ca 3 sh		78.83	12.71	0.59	0.04	0.05	0.40	0.05	4.55	2.76	99.98	0.8564
12 1744	J82-22-3 T-136-11	4/22/87	78.75	12.53	0.63	0.06	0.06	0.41	0.08	4.59	2.88	99.99	0.8558
13 2129	CCPC-5.36 lo Fe av. 8		78.80	12.84	0.60	0.05	0.07	0.39	0.08	4.42	2.76	100.01	0.8555
14 1745	J82-22-4 T-136-12	4/22/87	78.84	12.58	0.60	0.06	0.07	0.39	0.10	4.54	2.82	100.00	0.8524
15 598	SM-ASH-34, T56-7	07/01/83	77.08	13.59	0.54	0.10	0.06	0.54	0.08	3.95	4.07	100.01	0.8520
16 1997	WL-5-26 (97.21m) T165-10	5/22/88	78.07	12.00	0.55	0.02	0.07	0.43	0.07	3.64	5.15	100.00	0.8502
17 1250	TLN-2 T96-9	5/29/85	77.06	12.96	0.58	0.05	0.09	0.42	0.09	4.22	4.54	100.01	0.8501
18 2062	FLV-63-CS T170-8	9/3/88	76.87	12.94	0.58	0.04	0.09	0.43	0.06	3.77	5.23	100.01	0.8482
19 1453	LOS CHOCOYOS SC-7 T116-3	01/28/86	78.24	12.84	0.44	0.11	0.09	0.65	0.10	3.36	4.16	99.99	0.8466
20 1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.8459
21 1249	TLN-1 T96-8	5/29/85	77.28	12.76	0.56	0.04	0.08	0.44	0.08	4.09	4.69	100.02	0.8454
22 2194	FLV-65-MA T182-1	1/24/89	77.63	12.95	0.70	0.02	0.02	0.43	0.06	3.72	4.45	99.98	0.8441
23 1252	TLN-4 T96-11	5/29/85	77.26	12.83	0.58	0.04	0.08	0.45	0.08	3.95	4.74	100.01	0.8421
24 1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.8418
25 1671	84 NV 14-1	10/21/86	77.45	12.68	0.58	0.05	0.06	0.46	0.07	3.75	4.89	99.99	0.8414
26 2001	WL-5-12 (61.28M) lo Ca fract.	5/22/88	77.54	12.80	0.61	0.01	0.06	0.45	0.05	3.85	4.63	100.00	0.8413
27 1529	85-G-54 T113-2	10/22/85	77.45	12.65	0.57	0.06	0.06	0.38	0.09	3.69	5.05	100.00	0.8412
28 2147	SAFZ-5, T167-8, lo Ca 10sh		77.15	13.53	0.55	0.05	0.09	0.58	0.08	4.35	3.64	100.02	0.8410
29 280	PICO-74, T36-5		76.55	12.99	0.74	0.03	0.04	0.42	0.07	4.12	4.05	99.01	0.8408
30 281	PICO-76, T36-6		76.92	12.92	0.76	0.03	0.05	0.40	0.05	4.16	3.72	99.01	0.8387
31 284	PICO-78(3), T36-7		76.59	12.86	0.72	0.04	0.04	0.42	0.05	4.13	4.16	99.01	0.8385
32 17	BF-4, T28-7		76.05	14.34	0.65	0.13	0.08	0.52	0.04	4.04	4.15	100.00	0.8377
33 1716	TTC-13 T138-9	4/23/87	77.96	12.59	0.58	0.05	0.10	0.36	0.05	3.79	4.51	99.99	0.8374
34 1772	IHO51A T141-14	5/27/87	77.84	12.60	0.72	0.05	0.04	0.43	0.08	3.62	4.62	100.00	0.8372
35 34	BT-11A1, T13-6		77.55	12.72	0.69	0.03	0.04	0.43	0.06	3.69	4.78	99.99	0.8367
36 41	BT-11D2, T13-13		77.17	13.13	0.76	0.02	0.04	0.42	0.05	3.73	4.66	99.98	0.8366
37 2375	FLV-136-WP T201-3	10/12/89	77.63	12.74	0.72	0.03	0.03	0.43	0.05	3.61	4.75	99.99	0.8364
38 953	DR-66		77.71	12.70	0.73	0.03	0.04	0.42	0.07	3.80	4.50	100.00	0.8361
39 1715	TTC-12 T138-8	4/23/87	77.70	12.69	0.62	0.06	0.09	0.38	0.07	3.81	4.58	100.00	0.8360
40 29	BT-1C, T13-5		77.84	12.73	0.77	0.03	0.05	0.42	0.06	3.52	4.57	99.99	0.8359
41 218	MILLVILLE-5, T28-3		75.91	14.43	0.65	0.13	0.11	0.53	0.05	4.25	3.94	100.00	0.8358
42 38	BT-11C1, T13-10		77.71	12.59	0.72	0.03	0.04	0.42	0.06	3.67	4.76	100.00	0.8357
43 1989	WL-5-22 (85.15m) T165-2	5/22/88	77.93	12.32	0.60	0.05	0.06	0.46	0.11	3.77	4.71	100.01	0.8356
44 1868	FLV-40-WW T147-14	9/30/87	77.97	12.55	0.55	0.04	0.10	0.34	0.09	3.78	4.57	99.99	0.8350
45 1866	FLV-37-WW T147-11	9/30/87	77.74	12.65	0.55	0.05	0.08	0.40	0.09	3.17	5.28	100.01	0.8347
46 7	ASH CREEK-1, T28-1		75.93	14.35	0.63	0.12	0.10	0.54	0.05	3.98	4.30	100.00	0.8346
47 599	SM-ASH-35, T56-8	07/01/83	78.59	13.16	0.64	0.15	0.05	0.37	0.14	4.35	2.55	100.00	0.8345
48 276	PICO-41A. T8-8		77.38	12.94	0.73	0.03	0.05	0.42	0.04	4.01	4.39	99.99	0.8340
49 293	PICO-141, T39-7		77.29	12.84	0.73	0.03	0.02	0.42	0.07	3.68	4.91	99.99	0.8339
50 2322	NAP-2U T193-2	6/1/89	78.43	12.39	0.64	0.06	0.05	0.40	0.09	3.33	4.59	99.98	0.8337

Listing of 50 closest matches for COMP. NO. 1901 for elements: Na, Mg, Al, Si, K , Ca Date of Update: 2/12/90

	C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total.R	Sim. Co
1	1901	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	1.0000
2	2371	E67-113 2178 T151-12	11/10/87	75.77	16.08	0.45	0.57	0.01	0.42	0.00	3.58	3.12	100.00	1.0000
3	1900	E67-113 1640 (2) T151-2	11/10/87	76.81	15.88	0.30	0.59	0.01	0.48	0.01	2.41	3.52	100.01	0.8958
4	1899	E67-13 1640 T151-2	11/10/87	75.86	16.37	0.23	0.69	0.02	0.46	0.00	2.78	3.59	100.00	0.8943
5	1902	E67-113 1856 T151-11	11/10/87	77.21	15.64	0.23	0.49	0.00	0.51	0.00	2.49	3.43	100.00	0.8737
6	1842	FLV-17-WW T146-5	8/25/87	71.88	15.85	2.30	0.60	0.05	2.15	0.29	3.72	3.15	99.99	0.8388
7	1903	E67-113 1564 T151-3	11/10/87	75.20	16.70	0.21	0.71	0.01	0.47	0.00	2.04	4.66	100.00	0.8152
8	2354	FLV-108-WW T196-2	8/7/89	72.25	14.56	2.54	0.54	0.07	1.68	0.53	4.66	3.18	100.01	0.8010
9	955	DR-68M		72.31	15.24	2.48	0.57	0.06	1.94	0.47	4.31	2.61	99.99	0.7976
10	882	CB-8		72.63	14.47	2.41	0.51	0.05	1.80	0.49	4.52	3.11	99.99	0.7959
11	1413	MADRAS T112-4	10/22/85	73.18	15.21	2.63	0.44	0.07	1.87	0.37	3.55	2.69	100.01	0.7937
12	883	CB-9		72.30	14.54	2.46	0.52	0.05	1.80	0.50	4.71	3.11	99.99	0.7935
13	655	57M(2), T59-A4 (not org oxda)	xx/xx/xx	72.15	14.90	2.35	0.53	0.04	1.83	0.44	4.75	3.01	100.00	0.7928
14	1515	MOD-4 (2) (373) T119-14	4/28/86	74.85	14.90	1.26	0.39	0.12	1.86	0.12	3.59	2.90	99.99	0.7919
15	1676	RUSH CR-1 T133-2	10/21/86	71.66	14.65	2.76	0.62	0.08	1.71	0.64	4.57	3.31	100.00	0.7913
16	1427	ASW-6985-2 T103-2 8el	08/26/85	71.17	15.46	2.49	0.53	0.07	1.69	0.42	4.77	3.40	100.00	0.7912
17	881	CB-7		72.38	14.56	2.49	0.50	0.05	1.80	0.49	4.62	3.11	100.00	0.7905
18	654	57M(1), T55-3 (not orig oxids)	xx/xx/xx	71.59	15.64	2.90	0.71	0.07	2.45	0.44	3.45	2.75	100.00	0.7895
19	319	RBW-80-133C, MSH6-1		72.70	15.16	2.26	0.50	0.03	1.97	0.35	4.23	2.80	100.00	0.7894
20	2033	PF-88-E T169-2	10/2/88	73.41	14.61	2.14	0.43	0.04	2.06	0.26	3.95	3.10	100.00	0.7893
21	1674	PAOH-3(A) T132-15	10/21/86	73.84	13.96	2.26	0.45	0.04	2.10	0.28	3.89	3.19	100.01	0.7884
22	1586	ASW 61186-5C T129-1	8/19/86	71.11	15.43	3.27	0.52	0.13	1.41	0.56	4.82	2.74	99.99	0.7882
23	1563	WA 9-F T127-6	7/18/86	75.57	12.38	1.43	0.49	0.04	1.49	2.17	3.74	2.69	100.00	0.7880
24	1366	B7-1/2-TM1-Z2 T104-2	8/26/85	72.51	13.42	3.12	0.59	0.03	1.96	0.71	3.67	4.00	100.01	0.7879
25	1740	BRICE-2 T-136-7	4/22/87	77.25	13.45	1.26	0.15	0.08	0.56	0.21	3.59	3.47	100.02	0.7878
26	1095	61384-24 ASW T81-12	9/4/84	70.95	14.70	3.20	0.56	0.10	1.82	0.55	3.94	4.16	99.98	0.7871
27	1154	1S-IV-84-9A T86-8	12/4/84	71.75	14.69	2.57	0.63	0.06	2.17	0.46	4.26	3.41	100.00	0.7857
28	1536	M7810 T124-7	5/5/86	73.36	14.56	2.19	0.44	0.03	2.08	0.26	4.03	3.05	100.00	0.7856
29	228	MOD-4, T12-9		73.66	16.09	1.30	0.35	0.06	1.80	0.13	3.71	2.90	100.00	0.7856
30	951	DR-63		74.27	13.93	2.16	0.48	0.04	1.87	0.43	4.01	2.81	100.00	0.7844
31	506	CL-0315	08/16/83	73.62	14.20	2.11	0.50	0.04	2.22	0.35	4.13	2.84	100.01	0.7830
32	676	BUR-872, T59-B1	xx/xx/xx	70.15	15.13	3.39	0.57	0.08	1.88	0.47	5.40	2.94	100.01	0.7826
33	813	GS-57		72.38	14.74	2.38	0.49	0.03	1.77	0.49	4.71	3.01	100.00	0.7823
34	1222	CRL-9 T88-12	5/2/85	72.29	14.33	2.51	0.51	0.06	1.74	0.45	4.88	3.22	99.99	0.7807
35	2070	PF-88-E (2) T173-6	9/28/88	73.65	14.46	2.13	0.42	0.04	2.00	0.26	4.03	3.02	100.01	0.7791
36	2262	T189-1 912-M	5/9/89	72.22	14.03	2.75	0.54	0.03	1.64	0.54	3.79	4.46	100.00	0.7789
37	1289	Tulelake 2382 T100-1	07/02/85	72.17	14.51	2.63	0.49	0.05	1.73	0.47	4.64	3.31	100.00	0.7786
38	1548	PI-D5 (0.6CM)	7/17/86	74.31	13.86	1.92	0.46	0.06	2.15	0.35	3.99	2.89	99.99	0.7781
39	1539	KRL 10779-A T124-10	5/5/86	73.31	14.49	2.27	0.43	0.04	2.11	0.30	4.06	3.00	100.01	0.7776
40	1011	TULE LAKE 715 (682) T74-8	5/30/84	71.49	14.92	2.41	0.55	0.05	1.64	0.41	4.60	3.93	100.00	0.7774
41	673	TULELAKE-715 (wh pum), T59-A1	xx/xx/xx	70.87	15.50	2.67	0.68	0.06	1.99	0.42	4.14	3.68	100.01	0.7769
42	734	S-13		73.48	14.15	2.26	0.50	0.04	1.89	0.45	4.42	2.81	100.00	0.7766
43	1602	MOD-16 T130-12	9/19/86	72.88	13.84	2.42	0.50	0.08	1.52	0.54	4.97	3.24	99.99	0.7766
44	1152	11-IV-84-0 T86-6	12/4/84	71.71	14.91	2.26	0.51	0.09	1.50	0.50	5.05	3.46	99.99	0.7765
45	149	JCD-8, T1-16, P		73.66	14.98	1.85	0.36	0.07	1.30	0.35	4.38	3.06	100.01	0.7761
46	488	758-354H, T16-15, low total		76.93	14.04	1.46	0.03	0.01	0.52	0.10	3.62	3.29	100.00	0.7759
47	1068	324-M-RT T76-2	7/28/84	71.86	14.99	2.43	0.49	0.10	1.96	0.44	4.77	2.96	100.00	0.7756
48	869	LM-25		73.87	15.54	2.03	0.36	0.07	1.73	0.28	3.01	3.11	100.00	0.7755
49	726	LD-94		73.68	14.25	2.08	0.46	0.09	1.86	0.35	4.32	2.91	100.00	0.7755
50	2068	PF-88-I T170-14	9/3/88	71.73	14.87	3.59	0.50	0.11	1.73	0.48	4.38	2.62	100.01	0.7747