**Appendix of Supplimentary Data follows: Table A, Table B, Table C**

**Table A. Analyses of lavas from the southwest submarine rift zone of Mauna Loa**

Microprobe glass analyses

| Sample | P5-77-8 | P5-78-3 | Su9-64 | P5-77-2 | P5-77-1 | Su8a-64 | Su8b-64 | Su8c-64 | Su6-64 | Su13a-64 |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 215 | 355 | 550 | 640 | 680 | 1100 | 1100 | 1100 | 1865 | 2200 |
| SiO2 | 53.2 | 52.8 | 53.3 | 53.4 | 53.0 | 51.6 | 52.0 | 51.3 | 52.4 | 51.9 |
| Al2O3 | 14.2 | 14.1 | 13.1 | 12.9 | 13.3 | 13.3 | 14.1 | 12.7 | 14.3 | 14.2 |
| FeO | 9.79 | 10.70 | 12.30 | 11.00 | 11.60 | 12.40 | 10.70 | 12.40 | 10.80 | 9.65 |
| MnO | 0.14 | 0.15 | 0.17 | 0.16 | 0.17 | 0.17 | 0.16 | 0.17 | 0.14 | 0.13 |
| MgO | 6.68 | 6.71 | 4.52 | 5.71 | 5.65 | 5.59 | 6.53 | 5.61 | 6.66 | 6.71 |
| CaO | 10.90 | 10.50 | 8.52 | 9.47 | 9.60 | 9.45 | 10.70 | 9.38 | 10.50 | 10.30 |
| Na2O | 2.52 | 2.43 | 2.84 | 2.79 | 2.61 | 2.65 | 2.31 | 2.81 | 2.41 | 2.41 |
| K2O | 0.31 | 0.34 | 0.79 | 0.57 | 0.53 | 0.54 | 0.33 | 0.54 | 0.36 | 0.38 |
| P2O5 | 0.22 | 0.22 | 0.45 | 0.36 | 0.37 | 0.35 | 0.19 | 0.31 | 0.26 | 0.29 |
| TiO2 | 2.17 | 2.30 | 3.57 | 2.84 | 3.02 | 3.17 | 2.13 | 3.11 | 2.24 | 2.20 |
| S | 0.014 | 0.020 | 0.075 | 0.003 | 0.012 | 0.082 | 0.014 | 0.084 | 0.059 | 0.054 |
| Total | 100.1 | 100.3 | 99.6 | 99.2 | 99.9 | 99.3 | 99.2 | 98.4 | 100.1 | 98.2 |

| Sample | Su13b-64 | Su13c-64 | Su14a-64 | Su14b-64 | Su14c-64 | Su14d-64 | Su15c-64 | Su15d-64 | Su15e-64 | Su15f-64 |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 2200 | 2200 | 2925 | 2925 | 2925 | 2925 | 3660 | 3660 | 3660 | 3660 |
| SiO2 | 53.0 | 52.5 | 51.8 | 51.9 | 52.0 | 52.1 | 51.2 | 51.9 | 51.5 | 52.0 |
| Al2O3 | 13.9 | 13.9 | 13.8 | 14.4 | 14.4 | 14.1 | 13.8 | 13.8 | 13.8 | 14.2 |
| FeO | 9.71 | 9.67 | 11.20 | 11.10 | 10.20 | 11.20 | 11.40 | 11.30 | 10.25 | 10.20 |
| MnO | 0.17 | 0.13 | 0.16 | 0.16 | 0.14 | 0.17 | 0.17 | 0.17 | 0.16 | 0.15 |
| MgO | 6.82 | 6.96 | 6.67 | 6.67 | 7.12 | 6.41 | 6.47 | 6.45 | 8.00 | 7.64 |
| CaO | 10.60 | 10.50 | 10.40 | 10.40 | 11.00 | 10.70 | 10.30 | 10.40 | 10.60 | 10.80 |
| Na2O | 2.41 | 2.45 | 2.53 | 2.47 | 2.34 | 2.51 | 2.50 | 2.53 | 2.30 | 2.31 |
| K2O | 0.38 | 0.39 | 0.36 | 0.36 | 0.32 | 0.37 | 0.37 | 0.37 | 0.31 | 0.31 |
| P2O5 | 0.26 | 0.28 | 0.22 | 0.24 | 0.20 | 0.25 | 0.20 | 0.21 | 0.18 | 0.21 |
| TiO2 | 2.21 | 2.21 | 2.30 | 2.25 | 2.08 | 2.27 | 2.36 | 2.30 | 2.04 | 2.04 |
| S | 0.057 | 0.061 | 0.052 | 0.044 | 0.041 | 0.053 | 0.053 | 0.049 | 0.074 | 0.072 |
| Total | 99.5 | 99.1 | 99.5 | 100.0 | 99.8 | 100.1 | 98.8 | 99.5 | 99.2 | 99.9 |

**Table A--Mauna Loa (continued)**

Whole-rock analyses

| Sample | P5-77-8* | P5-78-3* | P5-78-1* | P5-78-2* | Su9-64† | P5-77-2* | P5-77-1* | Su8-64-4 | Su8-64-5 | Su8-64-6 |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 215 | 355 | 480 | 480 | 550 | 640 | 680 | 1100 | 1100 | 1100 |
| $SiO_2$ | 47.55 | 48.97 | 48.98 | 48.01 | 52.12 | 50.17 | 50.22 | 51.5 | 50.5 | 50.7 |
| $Al_2O_3$ | 9.47 | 11.04 | 12.69 | 11.27 | 13.41 | 11.01 | 11.57 | 13.0 | 12.4 | 11.9 |
| $Fe_2O_3$ | 11.85 | 11.77 | 12.37 | 11.85 | 2.47 | 11.56 | 11.83 | 1.94 | 1.56 | 1.88 |
| FeO | - | - | - | - | 9.45 | - | - | 9.50 | 9.85 | 9.29 |
| MnO | 0.17 | 0.17 | 0.18 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| MgO | 19.73 | 15.59 | 11.49 | 15.96 | 5.50 | 14.04 | 7.43 | 9.16 | 11.2 | 12.4 |
| CaO | 7.76 | 8.67 | 9.71 | 8.77 | 8.89 | 8.56 | 10.37 | 10.5 | 9.78 | 9.74 |
| $Na_2O$ | 1.57 | 2.00 | 2.19 | 1.99 | 2.97 | 2.05 | 2.32 | 2.09 | 2.00 | 1.82 |
| $K_2O$ | 0.21 | 0.25 | 0.24 | 0.20 | 0.72 | 0.37 | 0.48 | 0.33 | 0.29 | 0.29 |
| $P_2O_5$ | 0.14 | 0.16 | 0.22 | 0.16 | 0.42 | 0.20 | 0.26 | 0.23 | 0.20 | 0.19 |
| $TiO_2$ | 1.40 | 1.69 | 2.04 | 1.69 | 3.17 | 1.95 | 2.53 | 2.21 | 1.97 | 1.91 |
| $H_2O^+$ | - | - | - | - | 0.61 | - | - | 0.25 | 0.28 | 0.19 |
| $H_2O^-$ | - | - | - | - | 0.08 | - | - | 0.04 | 0.04 | 0.01 |
| $CO_2$ | - | - | - | - | 0.01 | - | - | 0.11 | 0.01 | <0.01 |
| Total | 99.85 | 100.31 | 100.11 | 100.06 | 100.17 | 100.11 | 99.53 | 101.03 | 100.25 | 100.49 |

| Sample | Su11-64* | Su13-64† | Su13-64* | Su14a-64 | Su14b-64 | Su14c-64 | Su14e-64 | Su15a-64 | Su15b-64 |
|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 1370 | 2195 | 2195 | 2925 | 2925 | 2925 | 2925 | 3660 | 3660 |
| $SiO_2$ | 48.71 | 48.50 | 48.69 | 50.0 | 50.9 | 51.3 | 51.1 | 47.2 | 50.8 |
| $Al_2O_3$ | 10.27 | 10.42 | 10.10 | 11.3 | 12.4 | 12.9 | 12.9 | 8.51 | 12.7 |
| $Fe_2O_3$ | 12.11 | 1.69 | 11.92 | 1.76 | 2.19 | 2.11 | 1.96 | 2.23 | 2.18 |
| FeO | - | 9.41 | - | 9.58 | 9.01 | 9.26 | 9.40 | 9.33 | 9.20 |
| MnO | 0.17 | 0.17 | 0.16 | 0.17 | 0.16 | 0.17 | 0.17 | 0.17 | 0.17 |
| MgO | 16.75 | 17.83 | 17.36 | 13.5 | 11.1 | 8.97 | 9.78 | 22.2 | 10.2 |
| CaO | 8.07 | 7.72 | 7.82 | 9.33 | 9.85 | 10.4 | 10.1 | 7.15 | 10.0 |
| $Na_2O$ | 1.79 | 1.76 | 1.81 | 1.78 | 2.18 | 2.08 | 2.08 | 1.39 | 2.12 |
| $K_2O$ | 0.26 | 0.32 | 0.31 | 0.28 | 0.28 | 0.33 | 0.30 | 0.20 | 0.31 |
| $P_2O_5$ | 0.16 | 0.16 | 0.17 | 0.18 | 0.19 | 0.21 | 0.20 | 0.14 | 0.20 |
| $TiO_2$ | 1.58 | 1.59 | 1.61 | 1.85 | 1.98 | 2.14 | 2.06 | 1.40 | 2.03 |
| $H_2O^+$ | - | 0.52 | - | 0.31 | 0.36 | 0.36 | 0.25 | 0.27 | 0.35 |
| $H_2O^-$ | - | 0.05 | - | 0.05 | 0.06 | 0.06 | 0.01 | 0.05 | 0.10 |
| $CO_2$ | - | 0.02 | - | <0.01 | 0.01 | <0.01 | <0.01 | 0.01 | <0.01 |
| Total | 99.87 | 100.19 | 99.95 | 100.09 | 100.67 | 100.29 | 100.31 | 100.25 | 100.36 |

† Analyses from Moore (1966). Su9-64 includes Cl=0.20 and F=0.05. Su13-64 includes Cl=0.03 and F=0.02.

* Analyses by X-ray fluorescence spectroscopy at the University of Massachusetts at Amherst. Analyst: J. M. Rhodes.

All other analyses by X-ray fluorescence spectroscopy at the U.S. Geological Survey, Denver. Analysts: J. Taggart, A. Bartel, and D. Siems. $H_2O^+$, $H_2O^-$, $CO_2$, and FeO analyses by classical tecniques, Analyst: S. Pribble.

## Table B. Analyses of lavas from the submarine east rift zone of Mauna Kea

Microprobe glass analyses

| Sample | Su20-64 | Su46a-66 | Su46b-66 | Su46c-66 | Su46d-66 | Su21-64 | Su22a-64 | Su22b-64 |
|---|---|---|---|---|---|---|---|---|
| Depth (m) | 1645 | 2135 | 2135 | 2135 | 2135 | 2865 | 3285 | 3285 |
| $SiO_2$ | 52.5 | 51.4 | 50.6 | 51.6 | 51.2 | 52.8 | 49.4 | 49.5 |
| $Al_2O_3$ | 13.8 | 14.1 | 14.2 | 14.0 | 14.1 | 13.4 | 14.8 | 13.6 |
| FeO | 11.2 | 10.5 | 10.5 | 10.5 | 10.6 | 11.2 | 11.3 | 11.8 |
| MnO | 0.16 | 0.16 | 0.15 | 0.16 | 0.16 | 0.18 | 0.17 | 0.16 |
| MgO | 5.38 | 6.90 | 6.75 | 6.90 | 6.89 | 6.05 | 5.60 | 5.44 |
| CaO | 9.40 | 10.9 | 10.9 | 11.3 | 11.1 | 10.0 | 10.1 | 9.90 |
| $Na_2O$ | 2.90 | 2.44 | 2.55 | 2.52 | 2.49 | 2.16 | 3.00 | 3.03 |
| $K_2O$ | 0.59 | 0.36 | 0.37 | 0.37 | 0.37 | 0.45 | 0.83 | 0.79 |
| $P_2O_5$ | 0.36 | 0.21 | 0.20 | 0.21 | 0.21 | 0.31 | 0.40 | 0.41 |
| $TiO_2$ | 3.19 | 2.33 | 2.37 | 2.40 | 2.36 | 2.86 | 3.36 | 3.67 |
| S | 0.081 | 0.042 | 0.034 | 0.048 | 0.045 | 0.123 | 0.099 | 0.102 |
| Total | 99.6 | 99.4 | 98.7 | 100.0 | 99.5 | 99.5 | 99.1 | 98.4 |

Whole-rock analyses

| Sample | Su19a-64 | Su19b-64 | Su19c-64 | Su19d-64 | Su20-64† | Su21-64† | Su22-64† |
|---|---|---|---|---|---|---|---|
| Depth (m) | 1280 | 1280 | 1280 | 1280 | 1645 | 2865 | 3285 |
| $SiO_2$ | 47.3 | 47.2 | 49.5 | 47.3 | 47.94 | 47.28 | 47.01 |
| $Al_2O_3$ | 12.3 | 12.2 | 12.7 | 9.22 | 10.43 | 10.00 | 12.12 |
| $Fe_2O_3$ | 1.96 | 2.08 | 2.46 | 2.10 | 2.03 | 2.30 | 2.86 |
| FeO | 10.56 | 10.37 | 9.57 | 9.54 | 9.54 | 9.05 | 9.29 |
| MnO | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 | 0.17 | 0.17 |
| MgO | 13.2 | 13.2 | 9.06 | 20.4 | 17.43 | 19.82 | 12.61 |
| CaO | 9.80 | 9.81 | 10.9 | 7.58 | 7.42 | 7.55 | 8.98 |
| $Na_2O$ | 2.21 | 2.20 | 2.28 | 1.65 | 1.99 | 1.59 | 2.36 |
| $K_2O$ | 0.36 | 0.35 | 0.49 | 0.23 | 0.39 | 0.26 | 0.72 |
| $P_2O_5$ | 0.23 | 0.22 | 0.30 | 0.17 | 0.24 | 0.14 | 0.27 |
| $TiO_2$ | 2.17 | 2.15 | 2.78 | 1.55 | 1.98 | 1.46 | 2.48 |
| $H2O^+$ | 0.28 | 0.30 | 0.30 | 0.31 | 0.49 | 0.39 | 0.66 |
| $H2O^-$ | 0.06 | 0.06 | 0.04 | 0.08 | 0.09 | 0.12 | 0.41 |
| $CO_2$ | 0.08 | 0.06 | 0.07 | 0.08 | 0.02 | 0.01 | 0.02 |
| Cl | - | - | - | - | 0.10 | 0.05 | 0.10 |
| F | - | - | - | - | 0.03 | 0.02 | 0.04 |
| Total | 100.7 | 100.4 | 100.6 | 100.4 | 100.17 | 100.19 | 100.06 |

†Analyses from Moore (1966). Additional whole-rock analyses by X-ray spectroscopy; D. F. Siems and J. E. Taggart, analysts; $H_2O^+$, $H_2O^-$, $CO_2$, and FeO by classical techniques; S. T. Pribble, analyst.

**Table C** **Analyses of lavas from Hualalai volcano**

Microprobe glass analyses

| Sample | P5-70-1 | P5-70-7 | P5-70-6 | P5-68-3 | P5-68-4 | P5-68-1 | P5-68-6 | P5-68-7? | P5-74-5 | P5-74-6 |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 510 | 530 | 535 | 745 | 750 | 780 | 780 | 820? | 860 | 860 |
| $SiO_2$ | 52.6 | 52.4 | 52.5 | 52.5 | 52.2 | 52.4 | 52.4 | 52.6 | 53.2 | 53.4 |
| $Al_2O_3$ | 14.3 | 14.6 | 14.3 | 13.2 | 14.1 | 13.3 | 14.2 | 13.6 | 13.9 | 13.9 |
| FeO | 9.92 | 9.96 | 9.76 | 11.4 | 10.2 | 12.8 | 10.4 | 11.7 | 9.70 | 9.73 |
| MnO | 0.14 | 0.15 | 0.15 | 0.16 | 0.15 | 0.18 | 0.16 | 0.18 | 0.14 | 0.14 |
| MgO | 6.98 | 7.43 | 7.04 | 6.42 | 7.58 | 5.92 | 6.68 | 6.15 | 6.83 | 6.70 |
| CaO | 11.0 | 11.1 | 11.1 | 10.3 | 10.9 | 9.83 | 11.1 | 9.93 | 10.6 | 10.6 |
| $Na_2O$ | 2.35 | 2.40 | 2.40 | 2.45 | 2.42 | 2.46 | 2.46 | 2.39 | 2.51 | 2.54 |
| $K_2O$ | 0.32 | 0.31 | 0.31 | 0.36 | 0.31 | 0.42 | 0.32 | 0.39 | 0.36 | 0.37 |
| $P_2O_5$ | 0.21 | 0.20 | 0.24 | 0.26 | 0.22 | 0.29 | 0.22 | 0.27 | 0.27 | 0.26 |
| $TiO_2$ | 2.20 | 2.12 | 2.18 | 2.39 | 2.11 | 2.64 | 2.26 | 2.49 | 2.41 | 2.44 |
| S | 0.010 | 0.006 | 0.007 | 0.007 | 0.006 | 0.005 | 0.006 | 0.018 | 0.004 | 0.004 |
| Total | 100.0 | 100.7 | 100.0 | 99.4 | 100.2 | 100.2 | 100.2 | 99.7 | 99.9 | 100.1 |

| Sample | P5-74-3 | P5-74-4 | P5-74-2 | 10-1,2,4 | 10-8 | 9-1,2,3, 12,14,15 | P5-74-1A | P5-74-1B | 11-6,7 | 11-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 935 | 965 | 1000 | 1020 | 1020 | 1025 | 1030 | 1030 | 1175 | 1175 |
| $SiO_2$ | 52.6 | 52.8 | 52.3 | 52.8 | 51.9 | 52.2 | 52.9 | 52.4 | 51.3 | 50.6 |
| $Al_2O_3$ | 13.9 | 14.1 | 14.1 | 14.1 | 13.7 | 14.0 | 13.9 | 14.0 | 14.8 | 14.3 |
| FeO | 10.4 | 9.70 | 10.5 | 9.70 | 10.3 | 10.7 | 9.44 | 10.5 | 9.80 | 11.7 |
| MnO | 0.16 | 0.14 | 0.15 | 0.16 | 0.16 | 0.16 | 0.13 | 0.17 | 0.17 | 0.19 |
| MgO | 6.89 | 7.67 | 6.74 | 7.31 | 8.05 | 6.72 | 7.32 | 6.87 | 6.68 | 6.45 |
| CaO | 10.7 | 10.7 | 10.9 | 10.6 | 10.6 | 10.5 | 10.8 | 10.4 | 11.1 | 10.8 |
| $Na_2O$ | 2.43 | 2.37 | 2.46 | 2.35 | 2.27 | 2.40 | 2.44 | 2.40 | 2.36 | 2.56 |
| $K_2O$ | 0.34 | 0.32 | 0.33 | 0.34 | 0.32 | 0.33 | 0.33 | 0.34 | 0.33 | 0.56 |
| $P_2O_5$ | 0.26 | 0.24 | 0.24 | 0.24 | 0.23 | 0.24 | 0.20 | 0.24 | 0.23 | 0.28 |
| $TiO_2$ | 2.23 | 2.21 | 2.18 | 2.16 | 2.03 | 2.24 | 2.18 | 2.18 | 2.07 | 2.09 |
| S | 0.054 | 0.007 | 0.057 | 0.004 | 0.044 | 0.050 | 0.004 | 0.060 | 0.017 | 0.052 |
| Total | 100.0 | 100.3 | 100.0 | 99.8 | 99.6 | 99.5 | 99.6 | 99.6 | 98.9 | 99.6 |

| Sample | P5-71-3 | 12-9,11,13 | P5-71-1 | 13-2,5 | 14-4,9 | 14-5,6,7 | 26-1,2,3 | 26-4,5,6 | 27-1,2 | 27-3,4 |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 1225 | 1345 | 1385 | 1660 | 1760 | 1760 | 2330 | 2330 | 2680 | 2680 |
| $SiO_2$ | 52.7 | 52.1 | 52.4 | 52.2 | 52.1 | 51.9 | 52.4 | 52.5 | 52.5 | 52.1 |
| $Al_2O_3$ | 13.9 | 14.3 | 13.4 | 14.2 | 13.5 | 14.1 | 14.1 | 13.8 | 14.2 | 13.9 |
| FeO | 9.67 | 9.80 | 11.8 | 9.80 | 11.9 | 10.6 | 10.2 | 10.2 | 10.5 | 10.5 |
| MnO | 0.15 | 0.16 | 0.17 | 0.15 | 0.19 | 0.17 | 0.16 | 0.17 | 0.17 | 0.17 |
| MgO | 7.55 | 6.96 | 6.11 | 7.24 | 6.28 | 6.71 | 6.97 | 7.46 | 6.74 | 7.60 |
| CaO | 10.5 | 10.6 | 9.93 | 10.6 | 10.2 | 10.5 | 10.6 | 10.9 | 10.7 | 10.9 |
| $Na_2O$ | 2.36 | 2.38 | 2.44 | 2.41 | 2.42 | 2.37 | 2.42 | 2.45 | 2.39 | 2.34 |
| $K_2O$ | 0.36 | 0.35 | 0.38 | 0.35 | 0.35 | 0.33 | 0.34 | 0.35 | 0.35 | 0.32 |
| $P_2O_5$ | 0.26 | 0.24 | 0.24 | 0.24 | 0.27 | 0.23 | 0.25 | 0.24 | 0.25 | 0.18 |
| $TiO_2$ | 2.03 | 2.00 | 2.58 | 1.98 | 2.36 | 2.16 | 2.09 | 2.21 | 2.17 | 2.04 |
| S | 0.024 | 0.023 | 0.029 | 0.029 | 0.030 | 0.062 | 0.062 | 0.062 | 0.063 | 0.062 |
| Total | 99.5 | 98.9 | 99.4 | 99.2 | 99.6 | 99.1 | 99.6 | 100.3 | 100.0 | 100.1 |

**Table C (continued)**
Whole-rock analyses

| Sample | P5-66-3A | P5-66-4 | P5-66-5 | P5-68-3 | P5-68-4 | P5-68-1 | P5-68-6 | P5-74-5 | P5-74-2 | 10-1 | 10-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 440 | 460 | 460 | 745 | 750 | 780 | 780 | 860 | 1000 | 1020 | 1020 |
| $SiO_2$ | 43.6 | 45.3 | 44.8 | 48.5 | 45.0 | 51.3 | 48.7 | 45.4 | 51.8 | 43.9 | 45.8 |
| $Al_2O_3$ | 6.19 | 6.02 | 6.00 | 9.88 | 6.11 | 13.6 | 10.4 | 6.29 | 13.4 | 5.51 | 7.96 |
| $Fe_2O_3$ | 1.75 | 1.36 | 1.52 | 1.73 | 1.28 | 1.94 | 1.49 | 1.50 | 2.21 | 1.03 | 1.24 |
| FeO | 10.0 | 10.1 | 10.2 | 10.1 | 10.2 | 9.4 | 9.8 | 10.0 | 8.45 | 10.3 | 10.58 |
| MnO | 0.17 | 0.16 | 0.17 | 0.18 | 0.16 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 | 0.18 |
| MgO | 29.9 | 29.4 | 30.2 | 18.5 | 29.9 | 8.06 | 17.1 | 29.5 | 7.93 | 30.8 | 23.9 |
| CaO | 5.42 | 4.79 | 4.87 | 8.13 | 4.83 | 11.0 | 8.56 | 4.96 | 10.7 | 4.35 | 6.61 |
| $Na_2O$ | 1.05 | 1.06 | 1.01 | 1.64 | 1.09 | 2.16 | 1.68 | 1.12 | 2.21 | 0.88 | 1.17 |
| $K_2O$ | 0.09 | 0.13 | 0.12 | 0.22 | 0.13 | 0.31 | 0.23 | 0.15 | 0.31 | 0.12 | 0.14 |
| $P_2O_5$ | 0.13 | 0.09 | 0.09 | 0.14 | 0.10 | 0.19 | 0.15 | 0.11 | 0.20 | 0.09 | 0.10 |
| $TiO_2$ | 0.96 | 0.91 | 0.90 | 1.52 | 0.93 | 2.03 | 1.58 | 1.00 | 2.10 | 0.87 | 1.07 |
| $H_2O^+$ | 0.20 | 0.11 | 0.12 | 0.29 | 0.06 | 0.24 | 0.26 | 0.09 | 0.39 | 0.01 | 0.27 |
| $H_2O^-$ | 0.09 | 0.14 | 0.04 | 0.06 | 0.02 | 0.06 | 0.05 | 0.01 | 0.04 | 0.07 | 0.01 |
| $CO_2$ | 0.17 | <0.01 | 0.02 | <0.01 | <0.01 | <0.01 | <0.01 | 0.02 | 0.01 | 0.01 | 0.01 |
| Total | 99.7 | 99.6 | 100.0 | 100.9 | 99.8 | 100.5 | 100.2 | 100.3 | 99.9 | 98.1 | 99.0 |

| Sample | 10-10 | 9-2 | P5-74-1A | P5-74-1B | 11-2 | 11-5 | P5-71-7 | P5-71-3 | P5-74-3 | P5-71-4 | P5-71-2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 1020 | 1025 | 1030 | 1030 | 1175 | 1175 | 1180 | 1225 | 1225 | 1260 | 1275 |
| $SiO_2$ | 43.8 | 50.8 | 45.2 | 51.3 | 48.6 | 46.0 | 46.7 | 49.0 | 51.4 | 47.8 | 48.5 |
| $Al_2O_3$ | 14.2 | 13.3 | 5.65 | 13.1 | 13.7 | 7.22 | 8.22 | 10.6 | 13.0 | 9.14 | 9.83 |
| $Fe_2O_3$ | 4.63 | 2.33 | 1.48 | 1.92 | 2.28 | 1.59 | 1.52 | 1.78 | 2.30 | 1.44 | 1.53 |
| FeO | 7.71 | 8.43 | 10.2 | 8.80 | 8.12 | 10.2 | 10.2 | 9.56 | 8.55 | 10.2 | 10.1 |
| MnO | 0.19 | 0.16 | 0.16 | 0.16 | 0.16 | 0.18 | 0.18 | 0.17 | 0.16 | 0.18 | 0.19 |
| MgO | 9.47 | 7.57 | 31.1 | 9.59 | 10.3 | 25.7 | 23.4 | 16.2 | 9.32 | 20.1 | 18.6 |
| CaO | 11.5 | 10.6 | 4.51 | 10.6 | 11.7 | 6.07 | 7.20 | 8.50 | 10.5 | 7.31 | 7.83 |
| $Na_2O$ | 2.01 | 2.15 | 1.02 | 2.15 | 2.01 | 1.13 | 1.29 | 1.78 | 2.17 | 1.54 | 1.66 |
| $K_2O$ | 0.13 | 0.33 | 0.13 | 0.30 | 0.41 | 0.17 | 0.14 | 0.27 | 0.32 | 0.23 | 0.24 |
| $P_2O_5$ | 0.52 | 0.24 | 0.10 | 0.20 | 0.17 | 0.11 | 0.11 | 0.17 | 0.20 | 0.15 | 0.16 |
| $TiO_2$ | 2.10 | 2.14 | 0.91 | 2.04 | 1.55 | 1.12 | 1.05 | 1.63 | 2.09 | 1.39 | 1.50 |
| $H_2O^+$ | 1.49 | 0.36 | 0.03 | 0.39 | 0.38 | 0.29 | 0.19 | 0.49 | 0.35 | 0.35 | 0.39 |
| $H_2O^-$ | 0.74 | 0.05 | 0.01 | 0.04 | 0.06 | 0.07 | 0.03 | <0.01 | 0.15 | 0.02 | 0.03 |
| $CO_2$ | 0.10 | <0.01 | 0.02 | 0.02 | 0.03 | 0.01 | <0.01 | <0.01 | 0.02 | <0.01 | <0.01 |
| Total | 98.6 | 98.5 | 100.5 | 100.6 | 99.5 | 99.8 | 100.3 | 100.2 | 100.5 | 99.9 | 100.5 |

**Table C (continued)**

| Sample | 12-4 | 12-9 | P5-71-1 | 13-1 | 14-1 | 14-4 | 14-5 | 26-2 | 27-1 |
|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 1345 | 1345 | 1385 | 1660 | 1760 | 1760 | 1760 | 2330 | 2680 |
| $SiO_2$ | 45.2 | 46.7 | 50.7 | 45.6 | 50.6 | 50.0 | 47.9 | 47.8 | 46.0 |
| $Al_2O_3$ | 7.19 | 9.28 | 12.8 | 7.55 | 13.4 | 12.5 | 10.4 | 9.10 | 7.16 |
| $Fe_2O_3$ | 1.25 | 1.23 | 0.86 | 1.08 | 1.99 | 1.29 | 1.30 | 12.7 | 12.8 |
| FeO | 10.39 | 9.87 | 10.0 | 10.4 | 9.10 | 10.3 | 10.4 | - | - |
| MnO | 0.17 | 0.16 | 0.16 | 0.17 | 0.17 | 0.18 | 0.18 | 0.17 | 0.17 |
| MgO | 25.80 | 20.30 | 9.96 | 24.9 | 7.78 | 10.2 | 16.5 | 20.3 | 25.8 |
| CaO | 5.72 | 7.14 | 10.4 | 5.90 | 10.6 | 10.0 | 8.23 | 7.35 | 5.99 |
| $Na_2O$ | 1.14 | 1.51 | 2.00 | 1.25 | 2.15 | 1.98 | 1.64 | 1.57 | 1.22 |
| $K_2O$ | 0.17 | 0.23 | 0.27 | 0.19 | 0.34 | 0.27 | 0.22 | 0.22 | 0.18 |
| $P_2O_5$ | 0.11 | 0.14 | 0.18 | 0.12 | 0.19 | 0.17 | 0.14 | 0.16 | 0.13 |
| $TiO_2$ | 1.04 | 1.33 | 1.87 | 1.10 | 2.07 | 1.90 | 1.52 | 1.51 | 1.17 |
| $H_2O^+$ | 0.19 | 0.47 | 0.20 | 0.34 | 0.32 | 0.34 | 0.38 | - | - |
| $H_2O^-$ | 0.05 | 0.05 | 0.03 | 0.02 | 0.16 | 0.01 | 0.01 | - | - |
| $CO_2$ | 0.01 | 0.01 | <0.01 | 0.01 | 0.08 | <0.01 | 0.01 | - | - |
| Total | 98.4 | 98.4 | 99.5 | 98.6 | 98.9 | 99.1 | 98.9 | 100.9 | 100.6 |

All analyses by X-ray fluorescence spectrometry. J. Taggart, A. Bartel, and D. Siems, analysts. $H_2O^+$, $H_2O^-$, $CO_2$, and FeO by classical techniques. S. Pribble, analyst.