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Distribution of Elements and Minerals in the Tippecanoe Sequence of the Western United States--Basic Data and Statistical Summaries

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DISTRIBUTION OF ELEMENTS AND MINERALS IN THE TIPPECANOE SEQUENCE OF THE WESTERN UNITED STATES--BASIC DATA AND STATISTICAL SUMMARIES

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INTRODUCTION

The Tippecanoe sequence is one of six major Phanerozoic units defined by Sloss (1963) that are bounded by continent-wide unconformities. The Tippecanoe includes rocks ranging in age from Middle Ordovician to Late Silurian, or possibly Early Devonian in deeper parts of the geosyncline in California, Nevada, and western Utah (fig. 1). In 1974, I undertook a regional geochemical survey of the Tippecanoe in the Western United States in order to provide background data to support detailed work on selected problems in more limited areas. Previously, A. T. Miesch and J. J. Connor conducted a similar survey of the underlying Sauk sequence, which included rocks of Cambrian and Early Ordovician age.

Regional distribution of sampling for the Tippecanoe sequence is shown on figure 2. Names for various groupings of samples are formally designated in this report as follows, from the largest to the smallest group: (1) a "Province" consists of pairs of "major Regions" about 250 mi apart (e.g., regions 1 and 13, upper right of figure 2, comprise of province); (2) "major Regions", numbered 1 to 14 consist of two "Areas" approximately 50 mi apart (see inset, lower left corner of fig. 2); (3) an "Area" consists of two "Pairs of sections" about 10 mi apart; (4) "Pairs of sections" consist of two sections about 2 mi apart; and (5) a "Section" is a more-or-less continuous stratigraphic exposure of Tippecanoe sediments where various lithologies were sampled. In addition, "minor Regions", numbered 20 to 32 on figure 2, consist of two sections about 10 mi apart, and are intended to fill in compositional or stratigraphic data between major regions.

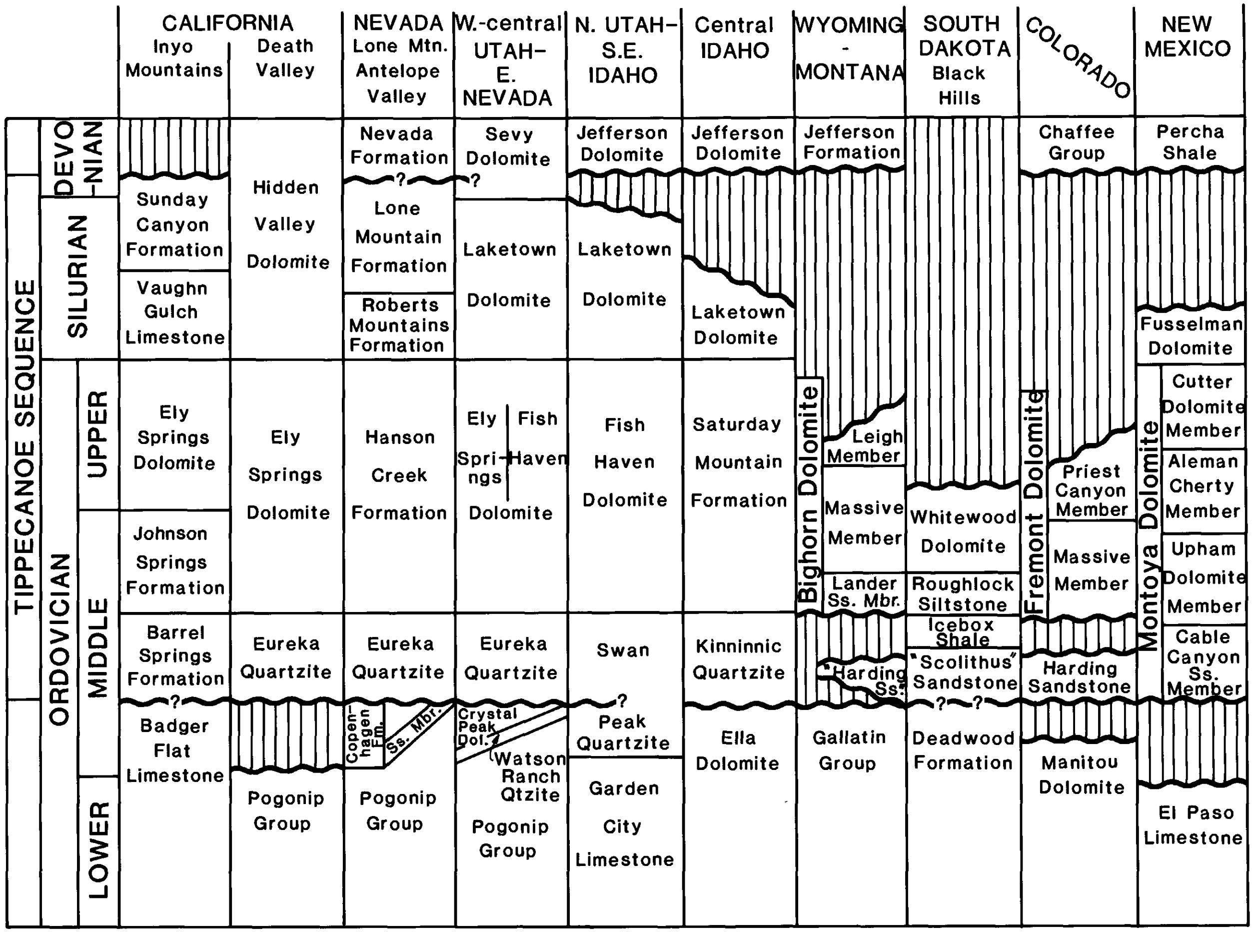
LITHOLOGIC SUBDIVISIONS

Tippecanoe Sequence

Three lithologies were sampled as separate targets--sandstone, shale, and carbonate rocks.

Sandstone, or quartzite where metamorphosed, typically is stratigraphically the lowest lithologic type, and was deposited as the Tippecanoe sea transgressed from the geosyncline in the west across the craton to the east. As a unit, these basal sandstone layers vary in thickness from a few feet near the transcontinental arch in the east to more than 1,000 ft in parts of Idaho and northern Nevada (fig. 3A). Where thin, the sandstone in many places is a sandy dolomite. In a large area in Montana and northwestern Wyoming, where other Tippecanoe sediments are present, sandstone was not deposited.

Figure 1.--Stratigraphic units in the Tippecanoe and adjacent sequences in the western U.S.



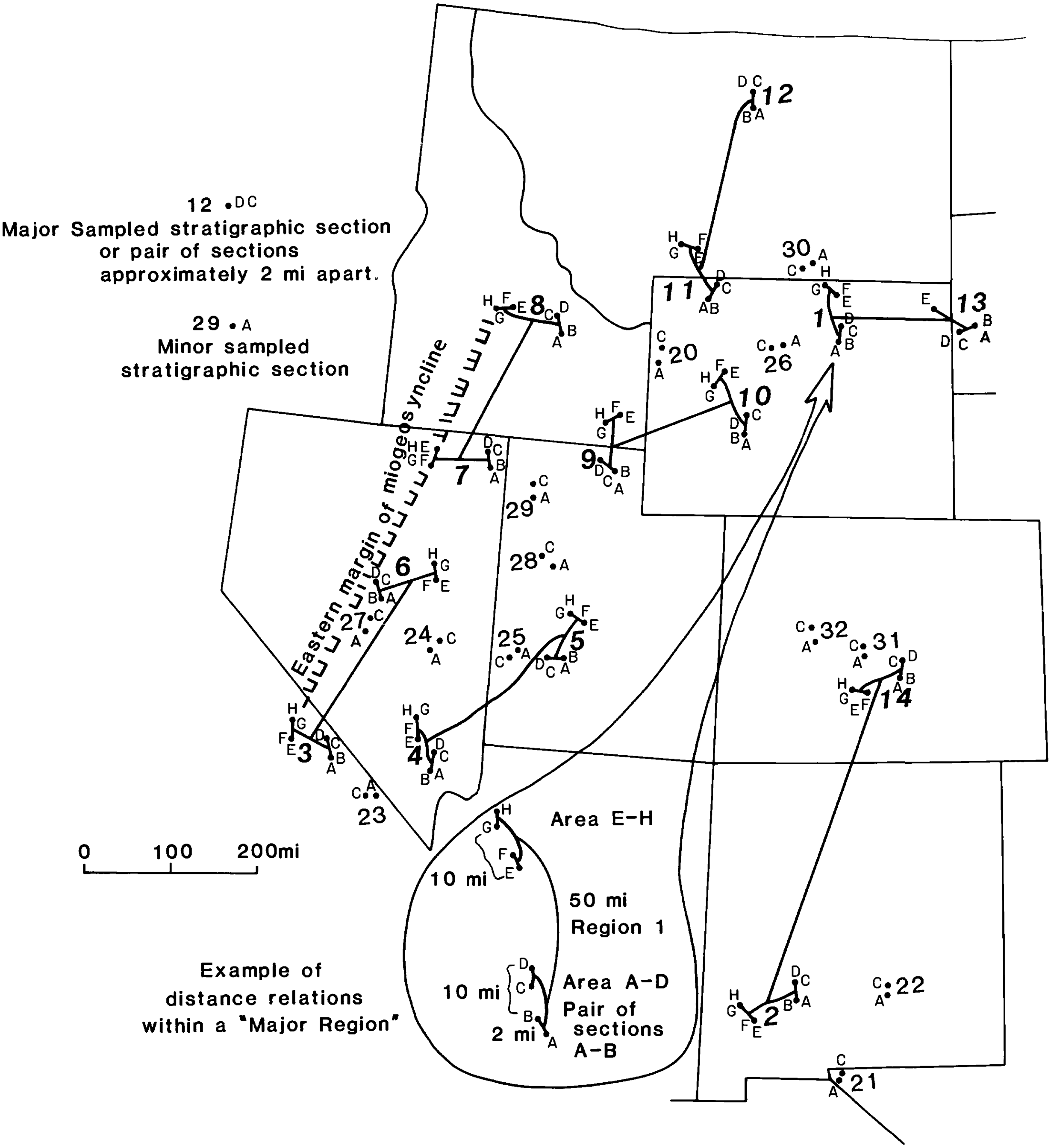


Figure 2.--General locations where Tippecanoe rocks were Sampled. All lithologic types were not sampled at all sections. See Appendix I for detailed sample locations.

Theoretically, shale should be the next lithologic unit above sandstone deposited some distance offshore in deeper water than the sandstone. Actually, shale is poorly represented in the Tippecanoe sequence, and where it occurs is most commonly interbedded with sandstone. In the Black Hills, the Icebox shale occurs below the Roughlock siltstone, and in a few westernmost sections, shale is interbedded with carbonate rocks. No attempt is made to portray distribution and thickness of Tippecanoe shale because it is so erratic.

The uppermost lithologic unit is carbonate rock--dolomite in most areas but less commonly limestone--deposited in offshore, relatively deep and clear water. The carbonates range in thickness from a few tens of feet generally in the east to a few thousand feet in the west (fig. 3C). The geographic extent of the Tippecanoe carbonates once was considerably wider than at present, but was largely removed by erosion during the time of the post-Tippecanoe unconformity, particularly high on the cration (fig. 1). In such areas, sediment thickness is determined as much by erosion as by deposition. No regressive clastic sediments have been recognized at the top of the Tippecanoe sequence.

The Watson Ranch Problem

Interpretation of what should be included in the basal sandstone of the Tippecanoe sequence can be problematical because regressive sandstone of the underlying Sauk sequence may immediately underly Tippecanoe sandstone at some localities. For example, Sloss (1963, fig. 1), shows the Swan Peak Quartzite as being in the upper part of the Sauk sequence, below the basal Tippecanoe unconfomirty at the base of the Eureka Quartzite. Yet, in the type area of the Swan Peak in the Bear Mountains of northern Utah, Vandorston (1970) interprets only the lower part of the Swan Peak as a regressive phase, and therefore in the Sauk sequence (fig. 1); he interprets the more massive and prominent sandstones in the upper part of the Swan Peak as transgressive, and therefore equivalent to the Eureka Quartzite and part of the Tippecanoe, although Van Dorston did not use the sequence terminology. Farther south, in west-central Utah and adjacent parts of Nevada, Webb (1958, fig. 13) showed a Swan Peak Quartzita below the Eureka Quartzite, and Hintz (1960) later gave the name Watson Ranch to this lower quartzite (fig. 1), apparently to distinguish it from the more stratigraphically inclusive Swan Peak of northern Utah. Similarily in central Nevada, at Lone Mountain and in Antelope Valley, a regressive sandstone at the base of the Copenhagen Formation is overlain unconformably by the Eureka Quartzite.

At 15 sections in Utah and Nevada where a distinction could be made between presumably regressive sandstones near the top of the Sauk sequence, and transgressive sandstones at the base of the Tippecanoe, two samples were randomly selected from each to determine if they were compositionally different. The Sauk samples, whether locally called Copenhagen, Watson Ranch, Swan Peak, or were included by others in the Eureka, are collectively referred to, herein, as the Watson Ranch. The Eureka quartzite and several other similar units at the base of the Tippecanoe sequence in New Mexico, Colorado, Wyoming, Idaho, and South Dakota are collectively called Eureka. Watson Ranch samples are not included in statistical summaries of Tippecanoe sandstones.

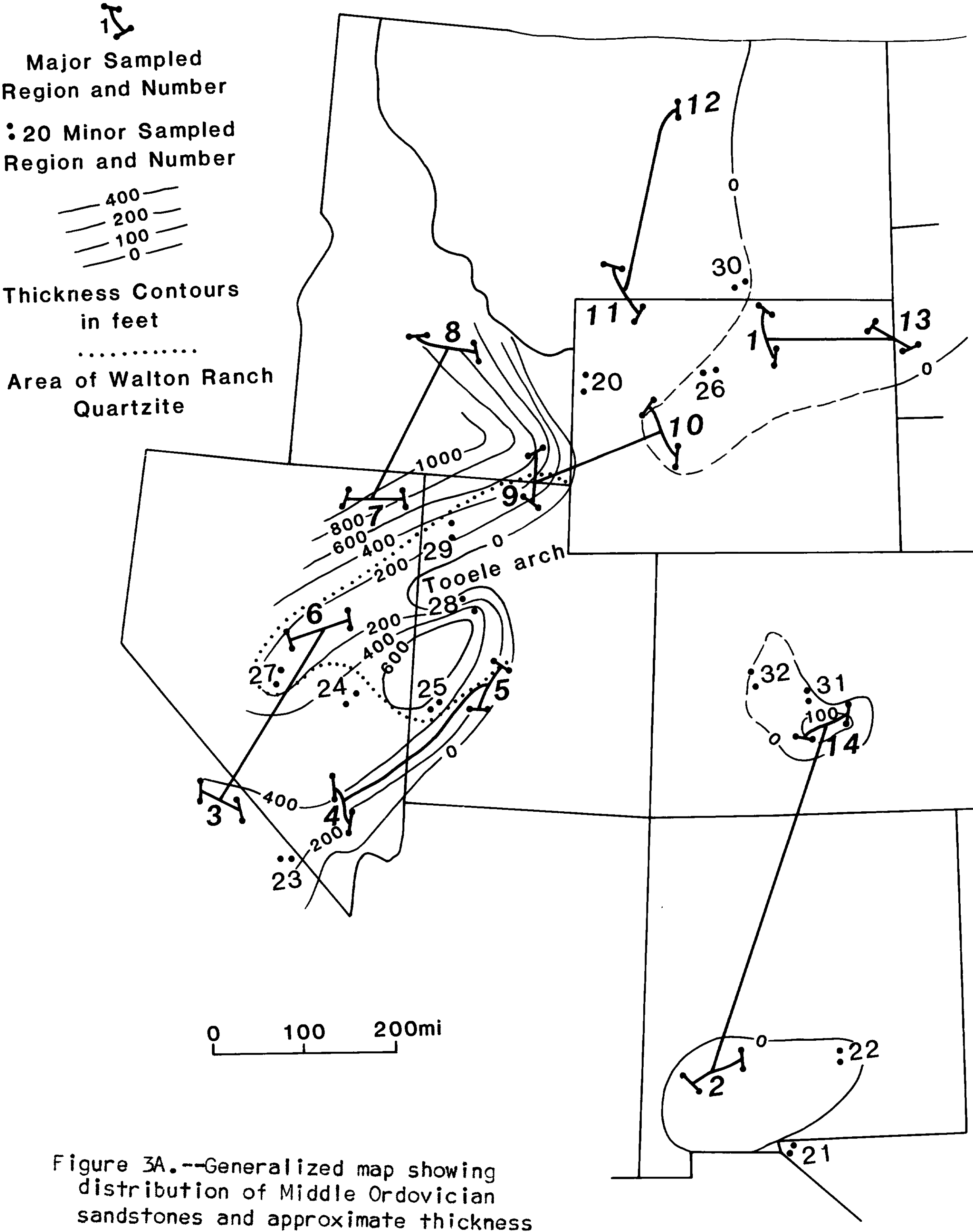


Figure 3A.--Generalized map showing distribution of Middle Ordovician sandstones and approximate thickness of the lower Tippecanoe sandstone.

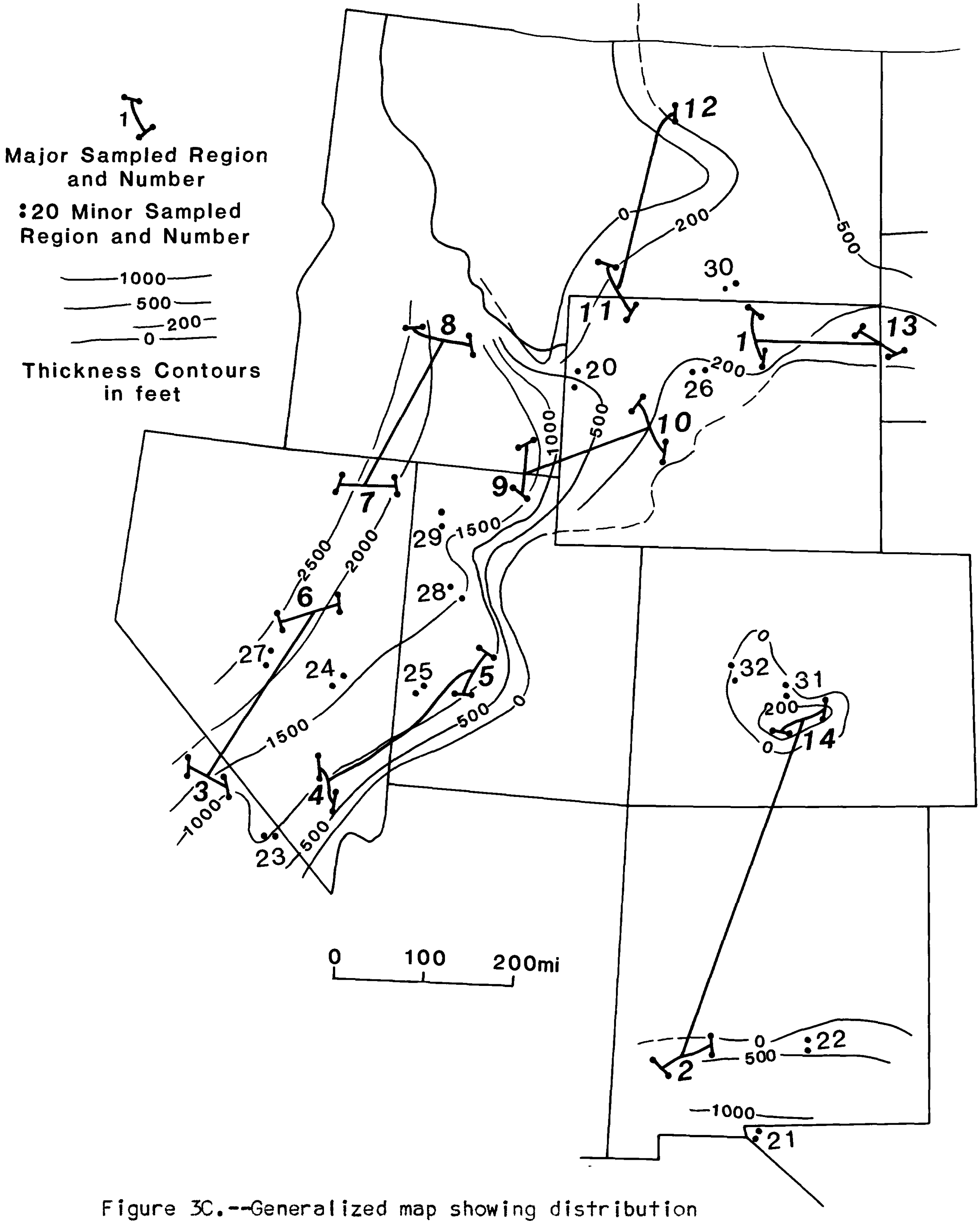


Figure 3C.--Generalized map showing distribution and thickness of Tippecanoe carbonate rocks.

SAMPLING DESIGN

Sampling of the Tippecanoe sequence is similar to that used by Miesch and Connor in their study of the Sauk sequence, and the rational behind it comes largely from those workers (written commun., 1982).

The primary purpose in sampling the Sauk and Tippecanoe sequences was to determine whether or not stratigraphic units of such broad stratigraphic and geographic extent could be studied in a meaningful way with a reasonably small number of samples and laboratory analyses. Specifically, the data of this study would be most useful for estimating the minimum amount of sampling necessary to draw firm conclusion about the distribution of elements in the three lithologic units of the sequence. The results did indeed demonstrate that some regional geochemical or mineral variations are so noisy as to be indescribable in any efficient or meaningful way. Data on other geochemical or mineral constituents, however, proved to be sufficient for describing some broad-scale variations. For many constituents, the limiting factor in this work was that concentrations in so many samples were below the limit of detection by the methods used.

The problem of determining the best ("most efficient") sampling design for studying any stratigraphic unit is two-fold. Because stratigraphic units are known to vary vertically much more rapidly than geographically, we can be sure that the best sampling plan involves sampling of stratigraphic sections separated by some selected distance that is generally much greater than the separation of samples within sections. The problem is two-fold because it requires the selection of (1) the optimum number of samples to take from each section, and (2) the most efficient spacing between sections. Because the sampling in this work is essentially exploratory and no *a priori* basis was available for either of these selections, only two samples were taken from each lithologic unit in each stratigraphic section and the sections were spaced at intervals of about 2 mi up to about 250 mi.

The decision to take only two samples from each lithologic unit within each stratigraphic section regardless of thickness is justified by the fact that the proper number of samples is a function of geochemical variability within the section, not thickness. It has been noted both in the field and from the results of the Sauk and Tippecanoe studies that section thickness and geochemical variability are related inversely, so that if some sections were to be sampled more heavily than others, they should be those that are thin. However, when the within-section variability is measured on a logarithmic scale, the correlation between variability and thickness tends towards small values, and sampling without regard to section thickness is appropriate. The two samples taken from each lithologic unit within each section provided ample data for estimating the within-section variability.

Search for an optimum spacing between stratigraphic sections to be sampled was done by spacing sections 2 mi apart, pairs of sections 10 mi apart, areas (groups of 4 sections) 50 mi apart, and regions (2 areas) 250 mi apart, as explained earlier in connection with figure 2. At least, those distances were used as closely as the distribution of suitable outcrop allowed.

SAMPLING DESIGN

Sample Numbering Scheme

Each sample number (see Appendix 1 and Appendixes 2, p. 2A-1, 2B-1, and 2C-1) consists of four or five parts--a number and three or four letters. The first number, from 1 to 32, identifies the region (fig. 2). The first letter identifies the section within the region. For major regions, the eight sections have letters from A to H, generally arranged geographically from south and east to north and west (fig. 2). An exception is region 6 in Nevada, where A-D are west of E-H. Also note that all major regions are not complete--regions 12 and 13. Sections A and B, C and D, E and F, and G and H are two miles apart; pairs of sections A-B and C-D are 10 miles apart, as are E-F and G-H; and areas A-D and E-H are 50 mi apart. Regions have been paired for statistical purposes into provinces with other regions approximately 250 mi distant. For minor regions, the letters A and C identify the two sections 10 miles apart.

The second letter of a sample number identifies lithology: S for sandstone, H for shale, and C for carbonate. However, sandstone from the Watson Ranch or its correlatives is designated by W rather than S. The third letter of each sample number designates the relative stratigraphic position of the two samples from each rock type--U for upper, and L for lower. The fourth letter, always R if present, indicates a replicate sample. Replicates were used only to determine analytical error. Thus, for example, sample 1HSU is the upper of two sandstone samples from the "Harding Sandstone" at section H in region 1, in the northern part of the Bighorn Mountains of Wyoming (figs. 1 and 2).

Randomization Procedures in the Field and Laboratory

Formal randomization procedures were used in the selection of the two samples from each lithologic unit within each stratigraphic section. After at least an approximate measurement of the thickness of the lithologic unit was obtained from either the literature or measurement in the field, the numbers were selected from a table of uniform random numbers. The random number was taken as the stratigraphic distance, in feet, above the base of the unit. Stratigraphic distances above the base were actually measured with tape or surveying equipment only if the unit was less than a few hundred feet in thickness. With thicker units, crude measurements to the approximate horizon were made by hand leveling, pacing, or with dividers on maps showing the upper and lower boundaries of the unit. On arrival at the general vicinity of the stratigraphic horizon to be sampled, two different procedures were used, depending on the quality of the outcrop. If the lithologic unit was well exposed and the sample could be taken almost anywhere in the general vicinity using an ordinary geologic pick and hammer with a heavy steel cold chisel, then a 20-50 ft section of tape was laid out across the strike of the bedding and a random number was drawn to identify the point along the tape at which the sample was to be taken.

If the lithologic unit was only poorly exposed at the general horizon chosen to be sampled, then about a dozen points or so within an area 20-50 ft across where samples could be taken were identified and numbered. The point to be sampled was then chosen by means of the random number table.

No formal randomization procedures were used in the selection of stratigraphic sections to be sampled. Rather, this selection was governed by compromise in satisfying the requirements of distance between sections and the need for the best possible exposure of the three lithologic units. Rarely was it necessary to choose between two or more sections that met these conditions equally, and in these cases ease of access provided the determining factor. In no case did the lithologic character of any of the lithologic units serve directly as the basis for selection.

Completion of the sampling program produced 246 sandstone samples, including 30 from the Watson Ranch, 36 shale samples, and 258 carbonate samples. From these, 30 sandstones, 10 shales, and 26 carbonate samples were selected at random for duplication in the chemical and mineral determinations. Twice as much of these duplicate samples as the others was ground to 100 mesh and then split into two parts with a Jones-type splitter. Each sample and duplicate sample was assigned a place in a random sequence by drawing slips of paper with field numbers out of a hat--i.e. from 1 to 276 for the sandstones, 1 to 46 for the shales, and 1 to 284 for the carbonates--and the samples were physically reordered according to these sequence numbers. Each randomized group was then submitted to the analytical laboratory for analysis in that order so that duplicate samples or samples from the same stratigraphic section might be analysed at about the same time, at widely separate times, or any time in between. Before submission to analytical laboratories for chemical analysis, a small split was taken from each ground sample for mineralogical analysis, which was also performed and interpreted in the randomized sequence before the results were sorted according to field numbers.

Analysis of Variance

The analysis of variance of the data obtained from each lithologic type was based on the following model (Miesch, 1976):

$$\chi_{ijklmno} = \mu + a_i + b_{ij} + c_{ijk} + d_{ijkl} + e_{ijklm} + f_{ijklmn} + g_{ijklmno} \quad \text{(eq. 1)}$$

where $\chi_{ijklmno}$ is the <u>oth</u> analysis of the <u>nth</u> sample from the <u>mth</u> section from the <u>lth</u> pair from the <u>kth</u> area from the <u>jth</u> region from the <u>ith</u> province. The term μ is the grand mean of χ in the entire lithologic unit throughout the western part of the craton, and the subscripted terms, a through o, respectively, represent the provinces, regions, areas, section pairs, sections, samples, and analyses. (It is common to replace χ with Log χ where the data are strongly skewed in a positive fashion.) The total variance in χ is partitioned among the seven sources of variance according to:

$$\sigma^2_\chi = \sigma^2_a + \sigma^2_b + \sigma^2_c + \sigma^2_d + \sigma^2_e + \sigma^2_f + \sigma^2_g \quad \text{(eq. 2)}$$

Variance due to analyses (analytical error, σ^2_g), because it was determined from only about 10 percent of the samples that were replicated, was estimated separately from the main analysis-of-variance computations. This analytical variance (σ^2_g) was substracted from the residual variance from the analysis-of-variance computations (which includes analytical variance) in order to determine the variance between samples from the same section (σ^2_f). Only data from sections in major regions were used to calculate these variance components. Because sampling from some of the major regions was incomplete, particularly so for the shales, the analysis-of-variance computation followed that for an unbalanced design (Anderson and Bancroft, 1952).

The 12 major regions in which sandstones were sampled (14 for the carbonates) are about equally spaced over the cratonic part of the western U.S. and could serve to construct very low-resolution maps of rock composition. The areas and smaller scale elements of the sampling design are very unequally spaced (as close as 2 miles and as far as several hundred miles) and could not be used in this way. However, even low-resolution maps would be meaningless if the variance among regions and provinces is small compared to variance within regions. The variance among regions for any oxide, element, or mineral is estimated by $\sigma^2_a + \sigma^2_b$, and the variance of the region mean (for a major region) is estimated by:

$$D_m = \frac{\sigma^2_{f+g}}{16} + \frac{\sigma^2_e}{8} + \frac{\sigma^2_d}{4} + \frac{\sigma^2_c}{2} \quad \text{(eq. 3)}$$

The variance mean ratio, V_m (Connor and others, 1972; Miesch, 1976) defined as the variance between regions, ($\sigma^2_a + \sigma^2_b$), divided by the variance of the region mean (eq.3) is given in tables 7A and 7C; it is not given for shales because of their sparse sampling.

METHODS OF LABORATORY ANALYSIS

Chemical

All chemical determinations, including major oxides and trace elements, were made in laboratories of the U.S. Geological Survey. Methods used to obtain data reported in Appendix 2 and names of the analysts are as follows:

Major oxides, SiO_2, Al_2O_3, Total Fe as Fe_2O_3, MgO, CaO, Na_2O, K_2O, TiO_2, P_2O_5, and S by X-ray fluorescence (XRF), J. S. Wahlberg, J. W. Baker, and J. E. Taggert Jr., except P_2O_5 and S in sandstones by XRF, B. King, M. Villarreal, and L. Espos; amounts below limits of XRF detection for Al_2O_3 (<0.02 for sandstones, <0.5 for carbonates), CaO(<0.02), and TiO_2 (<0.02 for sandstones, <0.05 for carbonates) are from spectrographic data, for MgO (<0.1) are from atomic adsorption, and for SiO_2 (<0.5) and K_2O (<0.02 for sandstones, <0.03 for carbonates) are calculated from mineralogy (see following section).

F, by specific ion electrode, V. Gardner and P. Guest

Ag, B, Ba, Be, Co, Cr, Cu, Ga, La, Mn, Mo, Nb, Nd, Li, Pb, Pr, Sc, Sr, V, Y, Yb, and Zr by 6-step spectrographic analysis, M. J. Malcolm for sandstones and shales, J. C. Hamilton and R. Havens for carbonates

As, Ge, Sb, Se, and Sn, by XRF-sulfide method, J. S. Wahlberg, M. L. Tuttle, and J. W. Baker, Br and I by XRF-halide method, J. W. Wahlberg, J. W. Baker, A. J. Bartel, M. L. Tuttle, and Wm. Walz

Mg, Na_2O, Li, and Rb, by atomic adsorption (AA), V. M. Merritt, W. F. Montjoy, and I. Frost

Hg, by wet oxidation and AA, J. A. Thomas and G. O. Riddle
Th and U, by neutron activation, H. T. Millard, R. J. Knight, and A. J. Bartel

Carbon, by combustion-gasometric method, P. H. Briggs and N. M. Conklin for sandstones, V. E. Shaw for shales and carbonates

Mineralogy

Minerals in Tippecanoe samples were determined by X-ray diffraction. Quantification of this mineralogy depended partly on chemical data and partly on the X-ray data.

Two types of sample mounts were used to obtain X-ray data. For all lithologies--sandstone, shale, and carbonate--a trace was made on a strip-chart recorder of unoriented, finely ground portion of the whole sample mounted in an end-loading holder with a cross-striated nylon front piece (Schultz, 1978). Simultaneously, X-ray intensity data from each sample were digitized on tape for quantitative comparison by computer with X-ray peak intensity data obtained from pure minerals under identical operating conditions. As lower limits of detection for minerals is generally on the order of a percent, but as low as 1/4 percent for strongly diffracting minerals like quartz or 3-5 percent for weakly diffracting minerals like the clays, powder samples served to identify and quantify only the more abundant minerals. Only a single mineral was detected in many unoriented samples of quartzite and dolomite.

Oriented aggregates for X-ray diffraction, prepared from ground powders in several ways, served to identify the less abundant minerals. Methods of sample preparation involved various chemical treatments, different degrees of size-fractionation, and particle concentration and orientation, depending upon lithology and the mineralogy determined from the X-ray trace of the unoriented powder. Carbonate minerals were dissolved from all samples containing them by repeated treatment with 1/2 N HCl; this acid concentration did not dissolve chlorite, talc, or corrensite. Residues were then repeatedly washed and centrifuged until defloculated. If the residue was small, as in the case of many carbonates, it was concentrated in a high speed centrifuge. The concentrate was resuspended in a small amount of water by ultrasonic probe, and the entire slurry pipetted onto a glass slide, where it air-dried and platey minerals oriented to some degree. If there was more carbonate residue than needed for a glass slide, only the finer-grained portion was used. Ground quartzites were disaggregated in water by an ultrasonic probe, and an appropriate amount of the finest material was separated by settling and centrifugation, and this was then oriented on a glass slide. Shales were ultrasonically disaggrated in water, allowed to settle for about 10 minutes, and the disbursed slurry was oriented on porous tiles by suction. X-ray diffraction traces of each oriented aggregate were made of the air-dried slide, of the same slide after glycolation, and after heating for 1/2 hour at 300°C and 500°C.

Because of the highly variable manner in which different samples for this study were handled, the quantitative estimates from X-ray data are, in fact, more semi-quantative than quantitative. Use of chemical data, however, add to the precision of the estimates considerably. Amounts of minerals in concentrations less than 1-2 percent are generally reported in standardized amounts like those of the 6-step semi-quantative spectrographic method used to determine many of the trace elements, where each order of magnitude is divided into six groupings of equal logarithmic width and reported as the approximate center value of each group--1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. This practice eliminates hair splitting when values may not be very accurate anyway; furthermore, some chemical constituents used to calculate amounts of minerals, notably Al_2O_3 below 0.1-0.5 percent, are reported on a 6-step semiquantitative basis. Amounts of chemical constituents assumed in the mineralogical calculations are given in table 1. Two examples, one for a sandstone and one for a dolomite, will illustrate the process and rationale of the mineralogical quantification.

Chemical and mineralogical data for sample 01ASL from the south end of the Bighorn Mountains are given in table 2A. Quartz, calcite, and K-feldspar were identified in the unoriented sample; amounts are normalized by the computer program to 100 percent. As illite and hematite were identified only in the oriented aggregate of the fine material, amounts are small and would lower amounts of the major minerals only slightly; the amount of quartz is probably a percent or so too high, because it exceeds the reported amount of SiO_2. Al_2O_3 and K_2O occur in both K-feldspar and illite--illite, rather than muscovite, as judged from the sharpness of the basal X-ray peaks from the oriented aggregate. Therefore, two simultaneous equations are set up for amounts of Al_2O_3 and K_2O in illite and K-feldspar (25 and 18 percent Al_2O_3, and 7 and 17 percent K_2O, respectively, from table 1. Solution of the equations gives 1.5 percent illite and 2.5 percent K-feldspar--in reasonably good agreement with the X-ray data. The amount of total carbon, 0.41 percent, corresponds to 3.4 percent calcite--more than the 2.21 estimated from X-ray and the 2.27 percent allowed by CaO. Therefore, 2.2 percent calcite is estimated in table 2, and the excess 0.15 percent carbon is assumed to be organic carbon. The amount of hematite is limited to about 0.2 percent by total Fe_2O_3; this amount must be highly concentrated in the fine fraction to be detectable by X-ray, and it illustrates how little hematite can give a sample a purple color. The amount of quartz estimated, 93 percent, is the maximum that will keep the total mineral content below 100 percent. The general agreement between the calculated totals of chemical constituents in minerals at the bottom of table 2A and the determined amounts at the top of table 2A is considered a good verification of the adequacy of both the chemical and mineralogical analyses.

Chemical and mineralogical data for sample 01HCL, a dolomite from the north end of the Bighorn Mountains, are given in table 2B. The only mineral detected in the unoriented sample other than dolomite is about 1/2 percent quartz. Illite, a slightly smaller amount of kaolinite, and some goethite were detected in the oriented fine fraction. After 0.5 percent of the 0.8 percent SiO_2 is assigned to quartz, 0.3 percent SiO_2 remain for a total of about 0.6 percent illite and kaolinite, which was divided into 0.3 percent illite and a slightly less 0.2 percent kaolinite. Had the next higher amounts of 0.5 illite and 0.3 kaolinite been assigned, total calculated SiO_2 would have been 0.88 percent SiO_2, or even farther from the determined amount. The

Fe_2O_3 allows a maximum of 0.3 goethite; 0.2 was assigned. Calculated amounts of 0.15 percent Al_2O_3 and 0.02 percent K_2O were substituted for the reported less-than values in Appendix 2C and were used in all the statistical summaries.

It should be noted that carbon (C) was handled differently in carbonates and sandstones. For sandstones, only total-C was actually determined. But in most sandstones the carbonate minerals were undetected or so sparse that mineral-C was only a small part of total-C. In this case total-C or a slightly reduced value is reported as organic-C. If carbonate minerals were abundant and calculated mineral-C was a large part of the determined total-C, then organic-C by difference was considered unreliable and reported as B (no data) in Appendix 2A. For carbonate samples, organic- and total-C were determined independently, and mineral-C by difference.

For sample 01HCL (table 2B) the 12.77 percent carbonate-C difference with total-C corresponds to 98.1 percent of ideal dolomite--in fairly close agreement with the 98.8 percent difference between the sum of the other minerals and 100 percent. However, the 20.4 percent MgO, when divided by 21.83 percent MgO in ideal dolomite, corresponds to only 93.3 percent ideal dolomite. This discrepancy is typical of Tippecanoe dolomites, as is an excess of CaO. The ratio of the amount of ideal dolomite calculated from determined MgO to the amount of dolomite determined from X-ray diffraction and carbonate-C (93.3/98.8 = 0.944, sample 1HCL appendix 2C-1 and 2C-76). The ratio averages 0.95 for all Tippecanoe carbonates that contain no or minor calcite.

Other indices in Appendix 2 that are indicative of the character of minerals in Tippecanoe rocks are as follows:

p. 2A-, 2B-, 2C-54, Muscovite or illite based mostly on sharpness of x-ray peaks.

p. 2A-, 2B-, 2C-56, types of layers in mixed layer clay.

p. 2A-, 2B-, 2C-57, Kaolinite crystallinity.

p. 2A-, 2B-, 2C-65, Monoclinic or Triclinic K-feldspar.

p. 2C-75, Dolomites only. For the 50-51° 2θ peak pair (CuK_α) the ratio between average peak height above background (usually fairly equal) and the height of the valley between the peaks.

SUMMARY OF RESULTS

Approximate locations of the sampled stratigraphic sections are shown on figure 2; more precise sampling locations are listed in Appendix 1, which also gives lithology, stratigraphic position, and references to the literature that were particularly helpful in planning the field work.

Raw Analytical Data

The three parts of appendix 2 (A, B, and C) show data for all constituents investigated in all samples and replicates of sandstone, shale, and carbonate rock in a way that allows relatively easy comparison of individual samples, areas, and regions. The first page of each part (2A-1, etc.) shows sample numbers, with western locations to the left and northern localities at the top, in the usual way a map is viewed. All constituents on subsequent pages have the same page number in parts A, B, and C; if all values for a constituent are indeterminate (L, N, B) or otherwise inapplicable (properties for mineral dolomite in sandstone and shale), then that page is omitted. Several letters and numbers from the page of sample numbers are repeated on subsequent pages, so that such things as regions, areas, localities, unsampled lithologies, and replicate samples can be identified without continually referring back to the sample numbers.

Percentiles and Concentration Ranges

Tables 3A, 3B, and 3C show ranges and concentrations of constituents in all samples of sandstone, shale, and carbonate rocks. The 50 percentile is, of course, the median concentration. Percentiles for the shales are different from the others, in that for the 36 shales a 99 or 97.5 percentile are meaningless because both represent less than a one sample difference from the maximum, whereas for sandstones and carbonates the 99th percentile represents a two sample difference from the maximum. The tables give a fairly simple picture of overall constituent concentration in lithologies as a whole, and facilitates comparisons between lithologies. For example, elements like B, Ba, Co, Cr, Cu, Ga, La, Nb, Ni, Rb, Sc, Th, and V, are an order of magnitude more abundant in shales than in sandstones or carbonate rocks, undoubtedly because they occur mostly in or on the clay minerals. For an element like Zn, the much larger median (50 percentile) in shale than sandstone indicates the occurrence of most Zn in clay, but the fairly large median content in carbonates indicates some Zn in carbonate minerals, and the high maximum Zn concentrations in sandstone and carbonate indicate mineralization. Sr is similarly concentrated in both clay and carbonate, but shows no mineralization factor. Relatively uniform concentrations of elements like As and Hg in the three groups indicate that they are unrelated to the major mineral components.

High Element or Mineral Concentration

Appendixes 3A, 3B, and 3C show samples of sandstone, shale, and carbonate rock that have concentrations above the amounts indicated in the headnotes and on the percentile tables. Because of the small number of shale samples, percentile concentration limits are used differently from those for sandstones and carbonates, and the number indicating the percentile requires some modification. For example, three shale samples have maximum Pb values of 70 ppm; but with only 36 shales, 3 samples span the interval from the 92nd percentile through the 95th to the maximum. Therefore all samples with 70 ppm Pb are reported as above the 95 percentile by the symbol "2" rather than the maximum by "5," and the one sample with 50 ppm Pb is recorded as "1," or above the 90 percentile.

It is readily apparent from appendices 3A, 3B, and 3C, particularly for the sandstones and carbonates, that certain samples, sections, and pairs of sections stand out as amomalous. For example, sandstone samples from sections E and F in region 2 in New Mexico are especially high in S, Ag, As, Cd, Cu, Mn, Pb, and Zn, and carbonate samples are high in Cd, Cu, Mn, Pb, and Zn. These samples are all located within a few miles of the Silver City mining district. Yet, sandstones at section 2H, just outside the Silver City limits show high concentrations only of Zn.

Another well known mineralized area is 13A-D in the northern Black Hills near the towns of Lead and Deadwood. Here, however, the effects of mineralization are not nearly so conspicuous. Most of the base metals concentrated in the Silver City area are not particularly high--only Pb and Zn are moderately concentrated in the sandstones. The trace elements that are concentrated--As, B, Ba, Co, Cr, Ga, Ni, Pb, Rb, Sc, Sr, Th, V, Y, Yb, Zn, Zr--particularly in the sandstones, are there because they occur in relativey large amounts of clay, K-feldspar, and heavy minerals like zircon.

Median and Mean Concentrations in Major Regions

Average concentrations of oxides, elements, and minerals in the major regions are expressed in two ways. Median concentrations in sandstones, shales, and carbonate rocks are listed in tables 4A, 4B, and 4C. Mean values are listed in tables 5A, 5B, and 5C. Most constituents have a geometric (log normal) distribution so the mean values given are geometric means (GM). However, constituents that comprise the predominant part of samples have more nearly normal distribution; for these the arithmetic mean (AM) is given. In sandstones, the AM of SiO_2 and quartz are given (table 5A) because quartz is the main constituent. In shale the AM of SiO_2, Al_2O_3, K_2O, and the minerals are given (table 5B), because quartz, illite or muscovite, and K-feldspar are the main constituents. In carbonate rocks the AM of dolomite, MgO, and mineral carbon are given (table 5C), because dolomite is the main constituent; presence of large amounts of calcite in some rocks gives CaO a more nearly log normal distribution. All other averages are geometric means.

The standard errors (SE or arithmetic deviation) or geometric errors (GE), whichever are appropriate for the average values in tables 5A, 5B, and 5C, are given in tables 6A, 6B, and 6C. The geometric error may be interpreted in much the same way as the standard error. Just as the true arithmetic mean has a 68 percent likelihood of being in the range AM ± SE, the true geometric mean has a 68 percent likelihood of being within the range GM ÷ GE to GM x GE. Similarly there is about a 95 percent likelihood that the true geometric mean is in the range GM ÷ GE^2 to GM x GE^2. The standard error of the arithmetic mean for a region (or the log of the geometric mean) for a major region is estimated by:

$$s_{\bar{x}}^{2} = \frac{\sigma_f^2}{16} + \frac{\sigma_e^2}{8} + \frac{\sigma_d^2}{4} + \frac{\sigma_c^2}{2}$$

where σ^2 is the variance between samples within sections (f), between localities (e), between pairs of localities (d) and between areas (c).

Some of the errors on tables 6A, 6B, and 6C are so high as to be meaningless. For example, on table 6A, the 13.26 geometric error for K_2O in region 13 implies that, with a geometric mean of 1.07 percent K_2O, (table 5A), 95 percent of the Tippecanoe sandstone in the region should have K_2O values between 0.0061 percent and 188 percent--$1.07 \underset{\div}{\times} (13.26)^2$. Any geometric errors greater than 3 or 4 imply severe nonnormality or even bimodality, and such computed errors cannot give realistic estimates of the range of values to be expected.

Analysis of Variance

Variance components in tables 7A, 7B, and 7C were determined for constituents having 80 percent or more of their values above the level of detection. Although statistical significance of variance between analyses (analytical precision) was not tested, for most elements precision looks good--that is, the analytical variance is generally 10 percent or less of the total variance. Analytical variance was tested by duplicate analysis of about a tenth of the total samples, and in some cases the result clearly overstates the analytical variance. For example, the 67 percent analytical variance for organic carbon in carbonates, and the 27 percent analytical variance for Zr in sandstones both exceed the variance between sample pairs, which includes the analytical variance. This is an obvious impossibility, but reflects the fact that both variance components are only estimates. Large variance components, generally between one quarter and one half of the total, occur between samples from within stratigraphic sections. Sandstones tend to show a fairly significant portion of their geographic variation on a small scale, between sections, which reflects variability on a scale of 0-2 mi. Carbonates tend to show about the same amount of variance, but on a scale of 2-10 mi. Both sandstones and carbonates have significant variance components for many elements between regions on a scale of 10-50 mi. Variance between regions and provinces tends to be complimentary--e.g. variance for a given chemical or mineral component tends to be significant at one scale or the other, but not both. Pairing of the regions to form provinces (fig. 2) was somewhat arbitrary, so the σ_a and σ_b components perhaps should be combined to give a variance for a scale of >50 mi, which averages about 20 percent of the total variance and is significant at 0.05 probability for about three-fourths of the constituents.

Shale samples are so eratically scattered in the sample area that no attempt will be made to evaluate the variance, other than to say that the analysis appears to be generally quite good (low analytical variance) and much of the variability appears to be at small scales.

The value V_m on tables 7A and 7C is the ratio of variation between regions to variation of region means. If variation is largely at small scales, then geochemical maps at large scales will be unstable. According to A. T. Miesch (1976, p. 102-103), "if V_m is less than 1.0, the true geochemical pattern for a region will not be clear from the geochemical map; as V_m is increased above 1.0, the true geochemical pattern becomes increasingly clear, and at about 3.0 or more they reflect true geochemical patterns very well." Thus, about three-fourths of the constituents in sandstones could be used to construct crude but meaningful maps from the averages for regions, but only a fourth of the constituents in carbonates could be so used.

Correlation Coefficients

Correlation coefficients are a numerical expression of the tendency of two constituents to occur together. Although it is normally expressed as a two placed decimal, on Plate 1 the decimal is omitted. The three coefficients for each pair of constituents are for the three lithologies--carbonate, shale, and sandstone. According to F. N. David (in Dixon and Massey, 1957, p. 464), for the approximatey 250 sandstones or carbonates a correlation coefficient of 0.12 is statistically significant at the 95 percent confidence level, and a coefficient of 0.32 is similarly significant for the 58 shale samples. However, for constituents like pyrite in carbonates which was found in only 8 samples (table 3C) a coefficient of 0.70 or more is significant at the 95 percent level ($p = 0.05$). Coefficients for constituents with fewer than 8 valid determinations were not calculated. Levels of significance actually cannot be calculated rigidly because the samples were collected according to a nested design rather than completely at random, so that the degrees of freedom are less than indicated by the total number of samples. Thus the level of significance is somewhat higher than stated, but since much of the variation is local, the effect of non-independent sampling probably is small.

Correlation coefficients, particularly large ones, commonly are very different for the three lithologies. For example the correlation of +0.75 between SiO_2 and Al_2O_3 in carbonates results from relatively large amounts of both quartz and clay in impure dolomite or limestone, whereas the negative correlations in sandstone and shale result from the complimentary abundance of quartz and clay in predominantly clastic rocks. Very large positive correlations of many elements with Al_2O_3 result from the fact that most Al_2O_3 occurs in clay, as do elements like Fe_2O_3, K_2O, TiO_2, B, Cr, Ga, etc.

Watson Ranch - Eureka

Composition of the regressive sandstone samples of the Sauk sequence that are herein collectively called Watson Ranch are compared in table 8 with basal transgressive sandstone of the Tippecanoe sequence that are collectivey called Eureka. For the comparison, amounts of constituents in two samples from each of 15 localities were averaged, and the averages for the Eureka and Watson Ranch were compared at each locality.

Indeterminate values (L and N) were handled in several ways. Mean values for the Eureka and Watson Ranch were calculated, using Cohen's technique (Miesch, 1976, p. 42), from the valid determinations, the lower limit of detection, and the relative number of indeterminate values; normal distribution of values was assumed for SiO_2 and quartz and a lognormal distribution for other constituents. For significance testing, the values listed in table 8 were substituted for L and N. Either L or N were reported for most constituents, but not both. If both L and N were reported, L meant a spectrographic line for that element was dectected, but it was so weak that the amount indicated was below the stated lower limit of detection; N indicates the line was not seen at all; therefore, L should indicate more of the element than N. If duplicate analyses indicated a real difference between L and N--as for B, Cu, Mn, Ni, Sr, and V--then a slightly lower value was substituted for N than for L; if no real difference was indicated--as for Cr, Y, Yb, and Zr--the same value was substituted. If all four values for the Eureka and Watson were the same indeterminate value at a given locality, then that locality was excluded from the significance calculation, and the degrees of freedom was reduced by one. No calculations were made for less than three degrees of freedom.

The Watson Ranch and Eureka sandstones differ, commonly at a very high significance level, in the higher concentration of non-quartz constituents in the Watson Ranch. The only elemental exception is Ge, which is almost equally abundant in both units, and, due to the similar ionic structures and sizes of Ge^{+4} and Si^{+3}, it may substitute for Si in quartz as well as other silicates.

The only locality where the reverse abundance of many constituents is evident is 29A in the southern part of the Newfoundland Mountains in Utah. There may be two reasons for this exception. First, Paddock (1956) reported 543 ft of Watson Ranch Quartzite (called Swan Peak by him) overlain by 218 ft of Eureka Quartzite, but I noted no marked change between the usually darker, more bedded Watson Ranch and the light colored, more massive Eureka at the appropriate stratigraphic level; the whole interval was medium to thick bedded sandstone interbedded with thinner dolomite beds. Second, the lower of my Eureka samples, 29ASL, came from a brown, 3-ft thick sandstone chosen by the usual system of random selection, but which contrasted markedly with adjacent white quartzites. As can be seen from appendix 2A, although 29ASL came from the interval that should have been Eureka, its mineral composition, like its appearance in the field, resembles that of the Watson Ranch.

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Table 1.--Chemical compositions, in weight percent, of some of the minerals used to calculate mineralogical composition of samples from the Tippecanoe sequence from chemical and X-ray diffraction data

Mineral	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	K_2O	C or CO_2		Other
Smectite	55	20	1-4	0-5	5[1]				0.5-1 TiO_2
Illite	50	25	1-4	1-2		7			0.5-1 TiO_2
Muscovite	45	30-35				10			
Kaolinite	46	40							
Chlorite	30-35	10-20	2-30	25-30					
Corrensite	40	15	2-5	20-25	1	0-3			
Quartz	100	--							
K-feldspar	65	18				17			
Calcite	--	--			56		12.0	44	
Dolomite	--	--		21.86	30.5		13.02	47.5	
Apatite	--	--			55			3	38 P_2O_5, 4 F
Hematite	--	--	100						
Anatase	--	--							100 TiO_2

[1] or Na_2O

Table 2.--Calculation of amounts of minerals from
X-ray and chemical data.
[In present]

A. Sandstone 01ASL

Minerals		Chemistry	
95.52	Quartz	94.2	SiO_2
2.27	Calcite	.84	Al_2O_3
2.21	K-feldspar	.29	Fe_2O_3
<3-5	Illite	.04	MgO(AA)
<1	Hematite	1.27	CaO
		.58	K_2O
		.41	Total C

0.25 Illite + 0.18K-feldspar = 0.84 Al_2O_3

0.07 Illite + 0.17K-feldspar = 0.58 K_2O

Illite = 1.5

K-feldspar = 2.5

		SiO_2	Al_2O_3	K_2O	MgO	CaO	C
Quartz	93.	93.	--	--	--	--	--
Calcite	2.2	--	--	--	--	1.23	0.26
K-feldspar	2.5	1.6	0.45	0.42	--	--	--
Illite	1.5	.75	.35	.10	~.04	--	--
Hematite	.2						
	99.4	95.35	.8	.52	.04	1.23	0.26
Organic-C							0.15

B. Dolomite 01HCL

Minerals		Chemistry	
99.45	Dolomite	0.80	SiO_2
0.55	Quartz	<.5	Al_2O_3
<2-3	Illite	.33	Fe_2O_3
<1-2	Kaolinite	20.4	MgO
<5	Goethite	33.47	CaO
		<.03	K_2O
		12.83	Total C
		.06	Organic-C
		12.77	Carbonate-C

		SiO_2	Al_2O_3	K_2O	MgO	CaO	C
Dolomite	98.	--	--	--	21.42	29.80	12.76
Quartz	.5	0.5	--	--	--	--	--
Illite	.3	.15	0.07	.02	--	--	--
Kaolinite	.2	.09	.08	--	--	--	--
Goethite	.2	--	--	--	--	--	--
	99.2	.74	.15	.02	21.42	29.80	12.76

Mg Dol Calculated/Mineral = 93.3/98.8 = 0.944 or

Available MgO/needed MgO = 20.4/21.42 = 0.952

Table 3A.--Ranges and percentile concentrations of oxides, elements, and minerals from 216 analyses of sandstones from the Tippecanoe sequence

[--, below detection limit]

Oxide, element, or mineral	Minimum[1]		Percentile									
			1	2.5	5	10	50	90	95	97.5	99	Maximum
	Percent											
SiO_2	0.10	(0)	5.32	9.89	34.50	65.06	96.80	>99	>99	>99	>99	>99
Al_2O_3	.03	(0)	.05	.06	.10	.10	.30	2.10	4.10	5.33	5.91	6.53
Fe_2O_3	.007	(0)	.01	.01	.01	.02	.05	.69	1.03	1.57	2.29	3.13
MgO	.002	(0)	.007	.01	.01	.01	.07	6.00	12.42	15.98	18.72	19.90
CaO	.003	(0)	.007	.01	.01	.02	.14	11.34	18.88	25.84	29.24	32.00
Na_2O	.01	(132)	--	--	--	--	--	.03	.05	.07	.09	.14
K_2O	.005	(0)	.005	.005	.005	.005	.07	1.03	2.05	3.36	3.73	4.40
TiO_2	.001	(0)	.001	.003	.003	.005	.02	.13	.23	.29	.39	.57
P_2O_5	.01	(12)	--	--	--	.01	.02	.10	.30	.47	.76	2.80
F	.04	(193)	--	--	--	--	--	.04	.05	.06	.09	.21
S	.0007	(16)	--	--	--	.0008	.004	.02	.04	.06	.13	.52
Total-C	.01	(25)	--	--	--	--	.12	3.91	6.94	9.51	11.43	12.66
Organic-C	.01	(27)	--	--	--	--	.05	.14	.16	.18	.19	.22
Carbonate-C	.01	(82)	--	--	--	--	.02	3.84	7.00	9.64	11.43	12.66
	Parts per million											
Ag	.1	(210)	--	--	--	--	--	--	--	0.60	2.8	5.0
As	.1	(25)	--	--	--	--	0.94	4.7	10	14	19	32
B	20	(167)	--	--	--	--	--	20	50	62	70	100
Ba	2	(0)	5.0	7.0	7.0	10	20	200	500	700	700	20000
Be	2	(214)	--	--	--	--	--	--	--	--	--	5.0
Br	.5	(187)	--	--	--	--	--	.89	1.7	3.3	4.3	6.8
Cd	1	(212)	--	--	--	--	--	--	--	--	4.0	6.0
Co	5	(203)	--	--	--	--	--	--	5.0	5.0	7.0	10
Cr	1	(58)	--	--	--	--	1.0	8.2	15	20	28	30
Cu	1	(68)	--	--	--	--	1.5	7.0	10	15	20	70
Ga	5	(197)	--	--	--	--	--	--	5.0	6.2	7.0	10
Ge	.1	(1)	.14	.26	.31	.37	.58	.98	1.3	1.5	1.7	4.6
Hg	.01	(14)	--	--	--	.01	.02	.05	.082	.17	.29	5.4
I	.5	(201)	--	--	--	--	--	--	.54	1.1	1.3	5.9
La	50	(210)	--	--	--	--	--	--	--	50	50	50
Li	5	(170)	--	--	--	--	--	10	13	28	49	126
Mn	1	(5)	--	1.0	1.0	1.5	20	150	200	300	500	700
Mo	5	(214)	--	--	--	--	--	--	--	--	--	5.0
Nb	10	(202)	--	--	--	--	--	--	10	10	10	20
Nd	70	(215)	--	--	--	--	--	--	--	--	--	70
Ni	5	(187)	--	--	--	--	--	5.0	7	10	10	10
Pb	10	(188)	--	--	--	--	--	10	20	100	280	300
Rb	5	(105)	--	--	--	--	5.0	24	40	57	77	90
Sb	1	(181)	--	--	--	--	--	1.4	2.4	3.8	4.8	13
Sc	5	(207)	--	--	--	--	--	--	--	5.0	5.0	5.0
Se	.1	(101)	--	--	--	--	.11	.31	.39	.46	.52	.88
Sn	.1	(98)	--	--	--	--	.13	.63	.77	.90	1.9	13
Sr	5	(115)	--	--	--	--	--	30	100	200	300	500
Th	1	(141)	--	--	--	--	--	4.0	6.5	8.4	13	18
U	.1	(5)	--	.10	.10	.13	.39	2.5	3.7	4.9	7.3	30
V	7.0	(176)	--	--	--	--	--	8.2	15	15	20	100
Y	10	(158)	--	--	--	--	--	15	20	30	50	50
Yb	1	(162)	--	--	--	--	--	2.0	3.0	5.0	5.0	7.0
Zn	5	(114)	--	--	--	--	--	25	39	66	1500	3600
Zr	10	(45)	--	--	--	--	20	300	500	700	1000	1500
	Percent											
Biotite		(216)	--	--	--	--	--	--	--	--	--	--
Illite-muscovite	.1	(19)	--	--	--	0.10	0.70	5.0	7.0	9.0	11	22
Mixed-layer clay	.1	(171)	--	--	--	--	--	.44	1.0	4.0	6.9	12
Kaolinite	.1	(149)	--	--	--	--	--	.50	1.0	1.5	2.0	3.0
Chlorite	.1	(210)	--	--	--	--	--	--	--	.10	0.44	2.0
Corrensite	.5	(210)	--	--	--	--	--	--	--	.50	.92	3.5
Talc	.1	(208)	--	--	--	--	--	--	--	.50	1.0	7.0
Total clay	.1	(7)	--	--	.10	.20	1.0	6.0	9.0	12	13	22
Quartz	.2	(0)	3.3	7.6	36	66	97	99	99	99	99.8	100
Potassium-feldspar	.05	(134)	--	--	--	--	--	3.0	9.2	15	20	20
Plagioclase	--	(216)	--	--	--	--	--	--	--	--	--	--
Calcite	.1	(130)	--	--	--	--	--	2.0	3.2	7.0	12	14
Dolomite	.1	(125)	--	--	--	--	--	27	55	73	86	90
Hematite	.05	(193)	--	--	--	--	--	.05	.30	1.0	1.5	2.0
Goethite	.05	(187)	--	--	--	--	--	.10	.50	.70	1.8	2.0
Anatase	.03	(182)	--	--	--	--	--	.05	.10	.20	.28	.5
Hornblende	.5	(213)	--	--	--	--	--	--	--	--	.50	10
Apatite	.2	(198)	--	--	--	--	--	--	.50	1.0	2.0	7.0
Pyrite	--	(216)	--	--	--	--	--	--	--	--	--	--

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[1] Minimum reported value. Value in parentheses is the number of determinations reported as below the minimum.

Table 3B.--Ranges and percentile concentrations of oxides, elements, and minerals from 36 analyses of shales from the Tippecanoe sequence

[--, below detection limit]

Oxide, element, or mineral	Minimum[1]		Percentile							
			5	10	20	50	80	90	95	Maximum
			Percent							
SiO_2	22.27	(0)	24.25	32.94	45.00	50.62	65.37	77.45	80.71	89.06
Al_2O_3	.90	(0)	.92	2.19	4.95	10.94	20.05	22.41	23.36	23.80
Fe_2O_3	.05	(0)	.09	.74	1.46	3.38	4.71	5.19	5.62	19.78
MgO	.28	(0)	.36	.60	1.22	1.84	5.61	8.98	12.62	13.80
CaO	.02	(0)	.06	.11	.25	.68	8.42	16.65	25.06	32.21
Na_2O	.02	(0)	.02	.04	.06	.10	.16	.17	.22	.24
K_2O	.03	(2)	.03	.51	1.45	5.10	6.70	6.97	7.35	7.56
TiO_2	.05	(0)	.08	.13	.20	.61	.80	.93	1.04	1.52
P_2O_5	1	(36)	--	--	--	--	--	--	--	--
F	.04	(4)	--	--	.05	.12	.20	.28	.36	.47
S	.08	(31)	--	--	--	--	--	.08	.12	.22
Total-C	.14	(0)	.15	.17	.19	.36	2.71	4.01	5.17	7.37
Organic-C	.03	(0)	.09	.13	.15	.33	.50	.69	.80	3.29
Carbonate-C	.01	(20)	--	--	--	--	1.97	3.49	4.82	6.81
			Parts per million							
Ag	1	(33)	--	--	--	--	--	--	1.1	2.0
As	.1	(0)	.53	.91	1.6	4.2	7.7	11	17	34
B	50	(3)	--	50	76	300	500	580	700	700
Ba	15	(0)	27	54	200	300	700	1000	1500	2000
Be	1.5	(11)	--	--	--	2.0	3.0	5.0	6.0	10
Br	.5	(30)	--	--	--	--	--	.57	.86	4.3
Cd	1	(36)	--	--	--	--	--	--	--	--
Co	5	(7)	--	--	5.0	7.0	15	30	30	100
Cr	15	(0)	15	26	30	100	140	150	150	150
Cu	2	(0)	2.8	4.2	15	30	50	82	110	200
Ga	5	(0)	5.0	6.2	10	20	46	50	50	50
Ge	.38	(0)	.41	.61	.76	1.1	1.4	1.6	1.8	10
Hg	.01	(1)	.01	.01	.02	.04	.09	.13	.18	.23
I	.5	(26)	--	--	--	--	.56	.80	.88	1.1
La	50	(15)	--	--	--	50	70	100	100	150
Li	5	(2)	--	5.0	10	20	48	54	79	190
Mn	10	(0)	10	20	20	100	200	300	540	2000
Mo	5	(28)	--	--	--	--	5.0	10	10	30
Nb	10	(6)	--	--	10	20	20	30	50	50
Nd	70	(26)	--	--	--	--	70	70	98	200
Ni	7	(0)	7.0	10	11	20	50	70	70	100
Pb	10	(9)	--	--	--	10	28	38	70	70
Rb	5	(2)	--	5.0	65	140	200	230	230	250
Sb	1	(23)	--	--	--	--	1.6	5.1	6.2	14
Sc	5	(4)	--	--	5.0	15	20	20	20	30
Se	.1	(3)	--	.12	.16	.29	.37	.62	1.0	2.7
Sn	.15	(0)	.28	.39	.66	.88	1.3	1.5	1.7	2.2
Sr	5	(0)	13	20	34	100	300	820	1200	2000
Th	1	(1)	2.6	3.7	6.0	16	23	25	30	39
U	.74	(0)	1.3	1.6	2.1	3.2	8.2	9.9	14	26
V	10	(0)	10	18	54	100	270	500	860	1500
Y	10	(0)	10	10	20	30	50	82	100	150
Yb	1	(0)	1.0	1.0	3.0	3.0	7.0	10	15	15
Zn	8	(0)	10	19	25	57	97	120	160	790
Zr	10	(0)	26	30	76	150	440	700	700	1000
			Percent							
Biotite	12	(32)	--	--	--	--	--	12	16	25
Illite-muscovite	1	(4)	--	--	10	40	69	80	81	85
Mixed-layer clay	5	(33)	--	--	--	--	--	--	5.0	5.0
Kaolinite	2	(26)	--	--	--	--	5.0	12	15	20
Chlorite	5	(30)	--	--	--	--	--	5.0	10	15
Corrensite	10	(35)	--	--	--	--	--	--	--	10
Talc	1	(33)	--	--	--	--	--	--	5.0	20
Total clay	7	(0)	9.4	14	25	50	79	81	85	85
Quartz	2	(0)	4.4	6.6	10	18	45	72	78	89
Potassium-feldspar	1	(6)	--	--	1.2	8.0	14	15	18	20
Plagioclase	--	(36)	--	--	--	--	--	--	--	--
Calcite	.2	(29)	--	--	--	--	.20	18	26	55
Dolomite	2	(30)	--	--	--	--	--	13	25	45
Hematite	.5	(26)	--	--	--	--	.50	1.0	1.0	1.5
Goethite	--	(36)	--	--	--	--	--	--	--	--
Anatase	.3	(22)	--	--	--	--	.50	.50	.76	1.0
Hornblende	2	(33)	--	--	--	--	--	--	2.2	70
Apatite	--	(36)	--	--	--	--	--	--	--	--
Pyrite	.2	(35)	--	--	--	--	--	--	--	.20

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[1] Minimum reported value. Value in parentheses is the number of determinations reported as below the minimum.

Table 3C.--Ranges and prcentile concentrations of oxides, elements, and minerals from 258 analyses of carbonate rocks from the Tippecanoe sequence

[--, below detection limit]

Oxide, element, or mineral	Minimum[1]		Percentile									
			1	2.5	5	10	50	90	95	97.5	99	Maximum
	Percent											
SiO_2	0.02	(0)	0.04	0.06	0.07	0.10	0.50	10.82	18.33	33.21	41.74	52.27
Al_2O_3	.01	(0)	.01	.02	.02	.03	.15	.50	1.20	2.48	4.79	5.50
Fe_2O_3	.01	(0)	.02	.02	.03	.06	.21	.73	1.18	1.51	3.30	7.31
MgO	.46	(0)	.50	.83	2.51	7.79	20.40	21.10	21.21	21.30	21.64	22.00
CaO	13.01	(0)	15.16	24.14	27.81	30.25	33.04	35.29	45.00	49.60	53.09	55.29
Na_2O	.01	(0)	.01	.01	.01	.02	.03	.05	.06	.07	.34	.67
K_2O	.002	(0)	.002	.002	.005	.007	.03	.26	.61	1.13	2.04	2.33
TiO_2	.0003	(0)	.0003	.0003	.0003	.0003	.002	.05	.09	.23	.32	.39
P_2O_5	1	(257)	--	--	--	--	--	--	--	--	--	1.09
F	.04	(149)	--	--	--	--	--	.07	.08	.09	.11	.13
S	.08	(256)	--	--	--	--	--	--	--	--	--	.16
Total-C	4.96	(0)	5.22	6.49	9.82	10.87	12.60	12.97	13.00	13.03	13.05	13.13
Organic-C	.01	(0)	.01	.01	.01	.02	.03	.07	.12	.17	.23	.32
Carbonate-C	4.91	(0)	5.06	6.34	9.72	10.77	12.57	12.94	12.97	12.99	13.02	13.11
	Parts per million											
Ag	1	(256)	--	--	--	--	--	--	--	--	--	10
As	.1	(7)	--	--	.18	.25	1.0	4.9	9.2	13	20	35
B	30	(245)	--	--	--	--	--	--	30	30	50	200
Ba	2	(78)	--	--	--	--	3.0	34	150	300	580	3000
Be	1.5	(258)	--	--	--	--	--	--	--	--	--	--
Br	.5	(13)	--	--	.51	.79	3.0	7.7	10	11	12	13
Cd	1	(254)	--	--	--	--	--	--	--	--	1.0	4.0
Co	5	(251)	--	--	--	--	--	--	--	5.0	5.0	7.0
Cr	1.5	(94)	--	--	--	--	1.5	7.0	15	25	38	70
Cu	1.5	(128)	--	--	--	--	1.5	5.4	7.0	10	15	50
Ga	5	(247)	--	--	--	--	--	--	--	7.0	10	15
Ge	.1	(188)	--	--	--	--	--	.17	.66	1.0	1.3	2.1
Hg	.01	(5)	--	.01	.01	.01	.02	.04	.07	.09	.13	.38
I	.5	(181)	--	--	--	--	--	1.0	1.3	1.7	2.3	3.1
La	100	(257)	--	--	--	--	--	--	--	--	--	100
Li	5	(229)	--	--	--	--	--	5.0	5.3	10	15	45
Mn	15	(0)	18	20	30	30	100	300	700	700	700	3000
Mo	7	(240)	--	--	--	--	--	--	10	13	17	30
Nb	15	(258)	--	--	--	--	--	--	--	--	--	--
Nd	100	(258)	--	--	--	--	--	--	--	--	--	--
Ni	5	(234)	--	--	--	--	--	--	7.0	10	15	30
Pb	15	(239)	--	--	--	--	--	--	21	70	180	700
Rb	5	(126)	--	--	--	--	5.0	16	25	30	54	70
Sb	1	(244)	--	--	--	--	--	--	2.0	2.7	23	46
Sc	7	(256)	--	--	--	--	--	--	--	--	--	7
Se	.1	(197)	--	--	--	--	--	.18	.23	.28	.40	1.4
Sn	.1	(87)	--	--	--	--	.22	.85	1.5	2.3	12	22
Sr	7	(0)	8.7	10	15	15	30	76	210	700	1000	2000
Th	1	(190)	--	--	--	--	--	2.0	3.0	4.6	6.5	14
U	.1	(5)	--	.10	.14	.20	.57	1.4	2.0	2.6	3.7	6.5
V	10	(207)	--	--	--	--	--	15	20	70	100	150
Y	15	(251)	--	--	--	--	--	--	--	15	15	20
Yb	1.5	(246)	--	--	--	--	--	--	--	1.8	2.0	3.0
Zn	7	(0)	7.0	8.0	8.0	9.0	13	43	75	150	460	1500
Zr	15	(238)	--	--	--	--	--	--	70	100	200	300
	Percent											
Biotite	0.1	(252)	--	--	--	--	--	--	--	--	0.54	3.0
Illite-muscovite	.01	(9)	--	--	.02	.05	.30	2.0	5.0	6.1	8.3	20
Mixed-layer clay	.01	(198)	--	--	--	--	--	.10	.20	.41	1.0	3.0
Kaolinite	.01	(132)	--	--	--	--	--	.30	.50	1.0	2.4	7.0
Chlorite	.01	(228)	--	--	--	--	--	.03	.10	.50	2.4	7.0
Corrensite	.5	(255)	--	--	--	--	--	--	--	--	.50	1.0
Talc	.01	(247)	--	--	--	--	--	--	--	.08	.58	3.0
Total clay	.01	(5)	--	.02	.06	.10	.50	2.3	5.1	8.6	15	20
Quartz	.01	(6)	--	.01	.01	.02	.30	10	15	26	31	47
Potassium-feldspar	.01	(119)	--	--	--	--	.01	.20	1.0	4.2	5.0	7.0
Plagioclase	.01	(240)	--	--	--	--	--	--	.01	.02	2.4	5.0
Calcite	.1	(99)	--	--	--	--	.20	12	73	85	91	96
Dolomite	.2	(2)	.20	1.7	7.6	39	98	99	99	99	99	100
Hematite	.1	(250)	--	--	--	--	--	--	--	.21	.50	5.0
Goethite	.1	(207)	--	--	--	--	--	.30	.50	1.0	1.4	2.0
Anatase	.01	(241)	--	--	--	--	--	--	.01	.01	.02	.1
Hornblende	.01	(256)	--	--	--	--	--	--	--	--	--	5.0
Apatite	3	(257)	--	--	--	--	--	--	--	--	--	3.0
Pyrite	.01	(250)	--	--	--	--	--	--	--	.06	.10	.3

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[1] Minimum reported value. Value in parentheses is the number of determinations reported as below the minimum.

Table 4A.--Median concentrations of oxides, elements, and minerals in sandstones of the Tippecanoe sequence in 12 major regions of the Western U.S.

			Percent									
Region no.	State	No. of samples	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	K_2O	TiO_2	P_2O_5	Total S	Total C
1	N. Wyoming	16	97.90	0.40	0.049	0.055	0.12	0.19	0.070	0.025	0.0020	0.11
2	SW. New Mexico	14	73.00	.30	.060	5.07	9.36	.052	.025	.014	.0073	3.33
3	E. California	12	97.40	.17	.035	.055	.24	.010	.007	.020	.0040	.07
4	S. Nevada	16	97.35	.17	.020	.020	.070	.025	.010	.020	.0024	.05
5	W.-Central Utah	16	98.25	.30	.040	.025	.025	.070	.020	.020	.0014	.09
6	Central Nevada	16	96.95	.15	.035	.045	.045	.010	.007	.020	.0030	.08
7	NE. Nevada	16	97.80	.20	.040	.045	.042	.020	.010	.030	.0050	.13
8	E.-Central Idaho	16	98.20	.20	.030	.020	.015	.020	.010	.020	.0035	.03
9	SE. Idaho-Utah	16	97.35	.40	.14	.069	.040	.11	.020	.030	.0035	.06
10	W.-Central Wyoming	12	46.50	.69	.84	9.88	15.57	.39	.020	.070	.017	5.76
13	W. South Dakota	10	87.95	5.14	.53	.20	.12	2.77	.25	.070	.010	.08
14	S.-Central Colorado	16	92.35	2.15	.26	.20	.28	1.01	.14	.070	.0065	.15

	Parts per million							Percent		
	As[1]	Ba	Ge	Hg[1]	Mn	U	Zr	Illite	Total clay	Quartz
1	0.32	30	0.65	0.0084	2.0	0.55	240	0.84	1.0	98
2	.55	15	.73	.030	200	.72	5.0	.20	1.2	72
3	1.0	17	.50	.020	39	.16	15	.24	1.0	99
4	.50	15	.50	.010	5.0	.15	17	.50	.50	99
5	.44	15	.61	.020	5.0	.41	30	1.0	1.3	98
6	.42	15	.54	.020	8.4	.18	10	.30	.30	99
7	1.2	84	.54	.070	10	.21	14	.39	.50	98
8	.50	24	.55	.020	10	.21	20	.50	.59	99
9	.90	17	.59	.010	10	.28	39	1.2	1.3	98
10	1.3	30	.49	.020	84	.74	5.0	1.7	1.8	46
13	9.1	700	.81	.010	39	1.69	300	3.0	7.3	73
14	1.4	150	.83	.020	39	3.52	300	3.9	4.7	86

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[1] Differences between regions not significant at 0.05

Table 4B.--Median concentrations of oxides, elements, and minerals in shales of the Tippecanoe sequence in 8 regions of the U.S.

			Percent										
Region no.	State	No. of samples	SiO_2[1]	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O[1]	K_2O[1]	TiO_2	F[1]	Total C	Organic[1] C
3	E. California	8	52.96	8.25	2.71	5.42	4.53	0.15	3.86	0.46	0.10	2.30	0.38
7	NE. Nevada	2	50.69	5.92	2.35	1.37	2.30	.032	1.88	.26	.098	1.90	.52
8	E.-Central Idaho	4	82.24	3.95	.22	.39	.13	.045	1.19	.26	.022	.73	.73
9	SE. Idaho-Utah	2	61.68	15.97	3.78	1.34	.46	.094	6.77	.63	.11	.15	.15
10	W.-Central Wyoming	2	48.26	10.44	2.04	6.05	7.94	.084	5.37	.45	.13	3.20	.44
13	W. South Dakota	8	49.85	22.41	4.17	1.64	.54	.13	6.68	.76	.16	.26	.26
14	S.-Central Colorado	6	60.67	12.84	4.07	1.49	.32	.11	5.61	.94	.16	.19	.18
31	Central Colorado	4	47.49	9.36	2.75	5.24	5.04	.14	4.79	.40	.37	1.30	.26

	Parts per million																	
	As[1]	B[1]	Ba[1]	Be[1]	Co[1]	Cr[1]	Cu	Ga	Ge	Hg	Li[1]	Mn[1]	Nb[1]	Ni[1]	Pb	Rb[1]	Sc[1]	Se
3	6.0	120	460	1.0	2.6	70	24	15	1.4	0.025	20	170	20	20	10	110	10	0.35
7	19	84	460	1.4	5.0	39	55	15	.68	.15	10	160	14	21	2.0	70	7.0	.14
8	6.9	70	870	1.2	1.0	39	17	8.4	1.2	.10	6.7	14	14	10	21	51	3.9	1.2
9	.29	390	700	3.2	5.9	84	3.2	24	.79	.014	5.0	24	20	32	10	150	12	.12
10	3.0	120	300	1.4	5.0	70	3.9	17	.80	.017	20	100	14	17	2.0	110	12	.27
13	3.5	300	300	2.4	15	150	39	50	1.2	.055	45	50	20	50	20	200	20	.21
14	4.1	590	300	3.0	15	100	84	30	1.2	.010	20	170	20	24	17	160	15	.20
31	3.4	320	140	3.2	8.7	55	17	21	.85	.045	87	100	14	17	24	130	10	.30

	Parts per million								Percent			
	Sn[1]	Sr	Th	U[1]	V[1]	Y	Zn	Zr	Illite	Total clay	Quartz	Potassium[1] feldspar
3	1.2	70	14	3.4	170	20	82	140	5.4	33	24	3.5
7	.59	67	6.1	2.6	84	17	62	67	25	28	40	.70
8	.51	20	5.1	4.9	500	24	17	55	12	18	80	2.5
9	.65	100	17	2.8	84	39	44	590	56	56	29	14
10	.74	84	12	1.9	59	20	18	100	40	40	25	13
13	1.2	300	23	2.8	150	30	57	120	78	81	10	8.0
14	.74	320	23	8.7	100	70	92	370	42	58	30	11
31	1.0	140	6.5	2.5	55	37	41	160	45	50	17	14

[1] Differences between regions not statistically significant at 0.05.

Table 4C.--Median concentration of oxides, elements, and minerals in carbonates of the Tippecanoe sequence in 14 major regions in the Western U.S.

			Percent										
Region no.	State	No. of samples	SiO_2[1]	Al_2O_3	Fe_2O_3	MgO	CaO[1]	Na_2O[1]	K_2O	TiO_2	Total C	Organic C	Carbonate C
1	N. Wyoming	16	0.74	0.15	0.26	20.35	33.00	0.045	0.030	0.0017	12.63	0.040	12.59
2	SW. New Mexico	16	2.92	.24	.38	19.60	32.84	.020	.059	.010	12.43	.040	12.40
3	E. California	16	1.01	.15	.20	20.15	32.80	.025	.030	.0030	12.44	.035	12.42
4	S. Nevada	16	.32	.030	.075	20.75	32.96	.030	.014	.0003	12.78	.040	12.74
5	W.-Central Utah	16	.30	.050	.12	20.30	33.54	.030	.014	.0003	12.65	.040	12.61
6	Central Nevada	16	.15	.030	.078	20.70	33.17	.030	.012	.0003	12.82	.040	12.74
7	NE. Nevada	16	11.63	.39	.33	3.82	41.74	.020	.10	.039	10.39	.13	10.27
8	E.-Central Idaho	16	.68	.17	.60	17.95	32.90	.020	.030	.017	12.22	.050	12.19
9	SE. Idaho-Utah	16	.39	.15	.10	21.10	32.70	.020	.030	.0020	12.58	.025	12.53
10	W.-Central Wyoming	16	.30	.10	.21	20.45	33.44	.030	.030	.0006	12.83	.030	12.80
11	SW. Montana	16	.50	.15	.26	20.50	33.27	.030	.030	.0015	12.75	.040	12.70
12	N.-Central Montana	8	.39	.17	.31	20.55	33.46	.025	.030	.0046	12.51	.035	12.48
13	W. South Dakota	10	4.99	.50	1.47	18.25	31.54	.030	.072	.015	12.20	.025	12.18
14	S.-Central Colorado	16	.50	.20	.38	20.65	32.62	.030	.030	.0059	12.66	.030	12.62

	Parts per million								Percent			
	As	Ba	Br	Hg[1]	Mn	Sr	U[1]	Zn	Illite	Total clay	Quartz[1]	Dolomite
1	0.86	3.9	4.1	0.010	120	20	0.42	11	0.50	0.50	0.50	98
2	1.1	7.0	1.7	.020	390	20	.60	68	.84	1.0	2.45	96
3	1.4	5.9	1.2	.014	150	50	.89	14	.24	.89	.050	96
4	1.0	1.0	1.9	.014	50	15	.39	11	.10	.11	.10	99
5	1.3	1.0	2.3	.020	50	30	.90	9.9	.17	.20	.10	98
6	.77	1.4	3.0	.025	50	20	1.0	13	.12	.13	.071	99
7	1.7	300	.73	.025	100	170	1.0	24	1.4	1.4	10	16
8	1.9	8.4	2.2	.020	200	39	.43	27	.50	.61	.45	98
9	.71	2.0	4.9	.010	70	15	.46	10	.30	.40	.24	99
10	.31	3.9	6.4	.010	100	24	.38	10	.30	.50	.050	98
11	1.1	2.0	6.1	.010	50	20	.60	11	.17	.40	.14	99
12	1.5	5.9	3.1	.010	150	24	.36	19	.50	.53	.78	98
13	8.2	15	2.6	.020	700	59	.74	19	1.0	1.8	4.0	89
14	.85	4.6	4.8	.010	300	20	.47	18	.50	.72	.14	98

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[1] Differences between regions not statistically significant at 0.05

Table 5A.--Average concentrations of oxides, elements, and minerals in sandstones of the Tippecanoe sequence in 12 major regions of the Western U.S.

[The averages for SiO_2 and quartz are arithmetic means; all other averages are geometric means]

Region no.	State	No. of samples	Percent									
			SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	K_2O	TiO_2	P_2O_5	Total S	Total C
1	N. Wyoming	16	96.16	0.34	0.077	0.062	0.11	0.12	0.077	0.029	0.0024	0.10
2	SW. New Mexico	14	71.08	.34	0.078	3.09	5.49	.039	.019	.022	.0070	1.90
3	E. California	12	95.39	.14	.046	.14	.43	.012	.0069	.021	.0030	.09
4	S. Nevada	16	96.84	.17	.022	.042	.11	.027	.0095	.026	.0022	.05
5	W.-Central Utah	16	98.18	.30	.043	.025	.032	.051	.015	.021	.0015	.06
6	Central Nevada	16	96.35	.16	.038	.072	.10	.014	.0072	.019	.0032	.11
7	NE. Nevada	16	93.89	.21	.042	.085	.11	.031	.012	.032	.0047	.14
8	E.-Central Idaho	16	97.82	.26	.034	.025	.029	.024	.013	.024	.0030	.03
9	SE. Idaho-Utah	16	96.19	.58	.16	.067	.051	.18	.026	.046	.0032	.05
10	W.-Central Wyoming	12	44.08	.75	.59	7.34	11.70	.45	.021	.053	.013	4.61
13	W. South Dakota	10	89.32	2.62	.39	.10	.15	1.07	.14	.067	.0092	.09
14	S.-Central Colorado	16	91.28	2.04	.27	.17	.32	.94	.18	.12	.0075	.16

	Parts per million							Percent		
	As	Ba	Ge	Hg	Mn	U	Zr	Illite	Total clay	Quartz
1	0.40	25	0.63	0.0091	3.2	0.62	230	0.51	1.0	95
2	.85	17	.73	.028	130	.72	9.0	.27	1.2	71
3	.84	18	.50	.016	29	.16	12	.21	1.1	95
4	.44	11	.50	.011	5.5	.16	14	.56	.59	98
5	.42	12	.65	.018	5.7	.40	35	.82	.85	98
6	.48	18	0.55	.022	9.3	.23	12	.25	.25	97
7	1.3	88	.45	.051	12	.28	18	.51	.60	94
8	.70	31	.62	.024	16	.23	25	.42	.59	98
9	.72	29	.56	.014	11	.31	45	1.3	1.7	94
10	1.5	29	.55	.019	73	.74	12	1.6	1.7	43
13	6.3	280	.82	.013	39	1.5	190	1.2	5.0	79
14	1.8	140	.78	.031	44	4.0	340	2.7	4.7	86

Table 5B.--Average concentrations of oxides, elements, and minerals in shales of the Tippecanoe sequence in 8 regions of the Western U.S.

[The averages for SiO_2, Al_2O_3, K_2O, and the minerals are arithmetic means; all other averages are geometric means]

			Percent										
Region no.	State	No. of samples	SiO_2[1]	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O[1]	K_2O[1]	TiO_2	F[1]	Total C	Organic[1] C
3	E. California	8	51.09	7.10	2.98	5.36	3.92	0.11	2.74	0.27	0.060	1.36	0.35
7	NE. Nevada	2	50.69	5.92	2.35	1.37	2.30	.032	1.88	.26	.098	1.90	.52
8	E.-Central Idaho	4	77.38	6.82	.30	.54	.10	.041	2.53	.33	.026	.71	.70
9	SE. Idaho-Utah	2	61.68	15.97	3.78	1.34	.46	.094	6.77	.63	.11	.15	.15
10	W.-Central Wyoming	2	48.26	10.44	2.04	6.05	7.94	.084	5.37	.45	.13	3.20	.44
13	W. South Dakota	8	49.55	22.19	4.15	1.67	.63	.13	6.57	.77	.15	.26	.25
14	S.-Central Colorado	6	60.02	13.01	3.47	1.50	.35	.11	5.17	.73	.14	.23	.19
31	Central Colorado	4	47.11	9.67	3.06	4.95	3.90	.13	5.16	.37	.38	1.13	.24

	Parts per million																	
	As[1]	B[1]	Ba[1]	Be[1]	Co[1]	Cr[1]	Cu	Ga	Ge	Hg	Li[1]	Mn[1]	Nb[1]	Ni[1]	Pb	Rb[1]		
3	5.3	45	250	1.2	4.6	51	18	12	1.4	0.032	19	230	14	21	6.0	31	5.7	0.38
7	19	84	460	1.4	5.0	39	55	15	.68	.15	10	160	14	21	2.0	70	7.0	.14
8	6.3	84	820	1.5	1.5	51	24	10	1.3	.12	8.0	14	16	12	15	68	5.5	1.1
9	.29	390	700	3.2	5.9	84	3.2	24	.79	.014	5.0	24	20	32	10	150	12	.12
10	3.0	120	300	1.4	5.0	70	3.9	17	.80	.017	20	100	14	17	2.0	110	12	.27
13	2.6	360	320	2.6	15	130	37	47	1.2	.062	38	57	20	46	20	210	20	.22
14	4.0	500	240	3.3	14	79	69	23	1.1	.013	23	140	24	27	18	130	16	.17
31	4.6	320	140	3.2	8.7	55	19	19	.86	.046	82	100	14	17	25	140	10	.26

	Parts per million								Percent			
	Sn[1]	Sr	Th	U[1]	V[1]	Y	Zn	Zr	Illite	Total clay	Quartz	Potassium[1] feldspar
3	1.1	65	11	4.4	130	22	100	140	11	33	29	7.6
7	.59	67	6.1	2.6	84	17	62	67	25	28	40	.70
8	.48	18	4.2	4.7	360	24	17	46	25	28	69	3.5
9	.65	100	17	2.8	84	39	44	590	56	56	29	14
10	.74	84	12	1.9	59	20	18	100	40	40	26	13
13	1.2	490	22	2.8	140	38	60	130	75	82	10	7.6
14	.67	340	22	7.3	87	65	81	380	49	54	34	11
31	1.1	120	6.8	3.2	51	38	46	150	44	49	18	13

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[1] Differences between regions not statistically significant at 0.05

Table 5C.--Average concentration of oxides, elements, and minerals in carbonates of the Tippecanoe sequence in 14 major regions in the Western U.S.

[Averages for MgO, total and carbonate C, and dolomite are arithmetic means; all other averages are geometric means]

Region no.	State	No. of samples	Percent										
			SiO_2[1]	Al_2O_3	Fe_2O_3	MgO	CaO[1]	Na_2O[1]	K_2O	TiO_2	Total C	Organic C	Carbonate C
1	N. Wyoming	16	0.86	0.14	0.24	19.59	33.17	0.041	0.029	0.0017	12.54	0.036	12.50
2	SW. New Mexico	16	1.94	.26	.42	18.49	32.17	.024	.053	.0063	12.10	.040	12.00
3	E. California	16	1.36	.19	.22	17.47	33.12	.026	.049	.0053	11.80	.034	11.74
4	S. Nevada	16	.33	.041	.066	20.42	32.81	.026	.014	.0006	12.63	.036	12.58
5	W.-Central Utah	16	.46	.060	.13	20.20	33.32	.024	.013	.0006	12.59	.037	12.55
6	Central Nevada	16	.34	.045	.059	20.66	32.98	.026	.016	.0009	12.69	.036	12.64
7	NE. Nevada	16	11.36	.63	.36	6.68	35.01	.040	.15	.033	9.81	.091	9.68
8	E.-Central Idaho	16	2.05	.37	.61	13.28	29.94	.023	.13	.011	10.42	.050	10.34
9	SE. Idaho-Utah	16	.44	.099	.10	20.96	32.49	.024	.028	.0015	12.50	.026	12.47
10	W.-Central Wyoming	16	.41	.11	.22	18.03	35.22	.031	.030	.0014	12.64	.026	12.61
11	SW. Montana	16	.46	.14	.28	20.49	33.44	.032	.025	.0014	12.72	.035	12.62
12	N.-Central Montana	8	.62	.20	.34	17.82	35.84	.025	.037	.0043	12.35	.031	12.32
13	W. South Dakota	10	4.12	.38	1.18	17.24	30.80	.036	.072	.016	11.61	.024	11.58
14	S.-Central Colorado	16	.57	.18	.31	20.26	32.63	.027	.046	.0037	12.49	.032	12.45

	Parts per million								Percent			
	As	Ba	Br	Hg[1]	Mn	Sr	U[1]	Zn	Illite	Total clay	Quartz[1]	Dolomite
1	0.85	4.2	3.6	0.012	120	22	0.42	15	0.33	0.41	0.53	95
2	1.3	6.0	1.8	.021	480	24	.69	89	.74	1.1	1.1	90
3	1.9	7.9	.84	.017	150	49	.73	18	.22	1.0	.15	83
4	.99	2.0	2.0	.016	45	21	.35	13	.14	.14	.19	98
5	1.2	1.9	2.4	.022	48	27	.82	11	.13	.15	.25	97
6	.73	2.5	2.6	.025	50	23	.69	14	.15	.19	.17	98
7	2.15	220	.84	.045	120	210	1.0	25	1.8	2.1	8.9	30
8	2.0	13	1.5	.020	200	74	.52	23	.95	1.2	.68	65
9	.48	1.9	4.2	.014	67	19	.41	10	.23	.33	.17	98
10	.36	4.2	5.6	.013	110	32	.36	11	.35	.48	.083	86
11	1.2	2.0	6.1	.012	53	20	.52	12	.11	.44	.14	98
12	2.4	5.3	3.1	.011	150	31	.50	18	.36	.71	.11	83
13	7.1	16	2.8	.023	450	58	.77	21	.72	1.3	3.1	85
14	.82	3.7	5.1	.013	260	25	.38	22	.34	.64	.14	97

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[1] Differences between regions not statistically significant at 0.05

Table 6A.--Errors of the average concentrations given in table 5A

[The values for SiO_2 and quartz are standard errors; all other values are geometric errors]

Region no.	State	No. of samples	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	K_2O	TiO_2	P_2O_5	Total S	Total C
1	N. Wyoming	16	2.16	1.65	2.33	1.52	2.23	2.76	1.09	1.43	1.35	1.71
2	SW. New Mexico	14	10.94	1.64	1.53	2.18	2.14	4.57	2.09	2.36	1.95	2.39
3	E. California	12	2.87	1.41	2.25	4.08	2.66	1.45	1.32	1.35	1.48	2.24
4	S. Nevada	16	.99	1.27	1.17	1.55	1.65	1.55	1.21	1.17	1.21	1.98
5	W.-Central Utah	16	.32	1.24	1.39	1.56	1.30	1.78	1.32	1.13	1.30	1.70
6	Central Nevada	16	.74	1.24	1.37	2.75	2.44	1.76	1.53	1.40	1.34	1.60
7	NE. Nevada	16	3.47	1.25	1.18	2.32	2.63	1.51	1.40	1.46	1.47	2.04
8	E.-Central Idaho	16	.87	1.33	1.30	1.37	1.92	1.82	1.42	1.12	1.67	1.40
9	SE. Idaho-Utah	16	1.87	1.95	2.61	1.53	1.63	2.39	1.69	1.56	2.00	1.62
10	W.-Central Wyoming	12	26.02	1.25	2.88	2.38	2.25	1.42	1.39	1.84	1.57	2.09
13	W. South Dakota	10	4.95	4.47	2.67	3.57	4.23	13.26	3.44	1.33	2.32	3.42
14	S.-Central Colorado	16	2.46	1.30	1.52	1.56	2.39	1.28	1.24	1.56	1.82	1.95

	As	Ba	Ge	Hg	Mn	U	Zr	Illite	Total clay	Quartz
1	2.03	1.39	1.08	1.12	1.83	1.15	1.50	2.35	1.27	2.51
2	3.08	1.81	1.25	1.25	2.65	1.51	1.58	2.35	1.98	10.76
3	1.53	1.28	1.13	1.36	2.50	1.27	1.47	1.79	2.11	3.66
4	1.96	1.22	1.09	1.12	1.59	1.20	1.40	1.35	1.35	.89
5	2.30	1.19	1.33	1.26	1.69	1.30	1.48	1.73	1.67	.28
6	1.74	1.38	1.15	1.26	1.44	1.24	1.24	2.07	2.54	.71
7	2.70	1.61	1.28	3.16	1.62	1.25	1.71	1.34	1.35	3.55
8	1.85	1.41	1.14	1.34	1.51	1.20	1.44	1.98	1.47	1.44
9	2.04	2.00	1.09	1.17	2.08	1.64	2.18	1.95	1.83	4.72
10	2.21	1.49	1.20	1.35	1.81	1.50	2.78	1.27	1.22	27.09
13	1.75	7.05	1.23	1.34	3.37	2.50	5.71	4.25	3.78	12.59
14	1.39	1.36	1.13	2.04	2.28	1.27	1.20	2.03	1.47	2.86

Table 6B.--Errors of the average concentrations given in table 5B

[The values for SiO_2, Al_2O_3, K_2O, and the minerals are standard errors; all other values are geometric errors]

Region no.	State	No. of samples	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	F	Total C	Organic C
3	E. California	8	8.04	3.07	1.96	1.35	2.31	1.71	1.75	1.98	2.19	1.66	2.27
7	NE. Nevada	2	20.10	.48	1.18	1.56	6.44	1.38	.10	1.13	1.41	2.61	1.05
8	E.-Central Idaho	4	8.62	3.43	3.10	1.67	2.03	1.45	1.51	1.58	2.59	1.25	1.23
9	SE. Idaho-Utah	2	2.34	1.54	1.02	1.06	1.02	1.12	.41	1.08	1.03	1.07	1.07
10	W.-Central Wyoming	2	1.48	.31	1.50	1.02	1.07	1.13	.19	1.05	1.08	1.06	1.13
13	W. South Dakota	8	1.56	.99	1.15	1.05	1.79	1.20	.43	1.04	1.47	1.28	1.26
14	S.-Central Colorado	6	7.44	3.41	1.44	1.40	2.48	1.19	1.24	1.63	1.46	1.21	1.30
31	Central Colorado	4	14.61	3.21	1.22	2.59	3.42	1.44	.77	1.77	1.13	4.26	1.35

	As	B	Ba	Be	Co	Cr	Cu	Ga	Ge	Hg	Li	Mn	Nb	Ni	Pb	Rb	Sc	Se
3	1.50	3.24	--	1.14	2.84	1.65	1.87	1.43	1.50	1.45	2.00	1.76	1.41	2.13	1.99	--	1.94	1.18
7	1.13	1.13	1.35	1.28	1.00	1.20	2.50	1.00	1.50	1.07	1.63	2.26	1.28	1.28	1.00	1.05	1.00	2.02
8	1.32	1.41	2.11	1.46	1.50	1.53	1.58	1.50	1.09	1.31	2.52	1.28	1.94	1.19	2.66	1.59	1.63	1.76
9	1.82	1.20	1.00	1.38	1.13	1.13	1.38	1.15	1.15	1.28	1.00	1.15	1.00	1.38	1.00	1.01	1.15	1.86
10	1.03	1.15	1.00	1.28	1.00	1.00	1.20	1.11	1.20	1.47	1.00	1.00	1.28	1.11	1.00	1.08	1.15	1.10
13	1.86	1.22	1.30	1.27	1.50	1.22	1.31	1.14	1.19	1.55	1.71	2.06	1.00	1.45	1.20	1.09	1.19	1.36
14	1.55	1.29	1.93	1.33	1.41	1.62	1.62	1.78	1.14	1.54	1.28	2.11	1.46	1.47	2.11	1.59	1.07	1.62
31	3.26	1.85	1.71	3.16	1.73	1.83	1.28	1.57	1.20	1.45	2.10	1.46	2.07	1.15	1.80	1.15	2.00	1.16

	Sn	Sr	Th	U	V	Y	Zn	Zr	Illite	Total clay	Quartz	Potassium feldspar
3	1.38	1.44	1.51	2.48	5.35	1.57	1.B4	1.56	6.42	12.82	11.62	6.61
7	1.21	2.88	1.29	1.39	1.13	1.47	1.47	1.77	.00	1.77	20.86	.00
8	2.20	1.78	2.61	1.21	1.63	1.15	1.79	2.10	15.00	12.75	14.32	1.58
9	1.03	1.00	1.06	1.17	1.13	1.20	1.54	1.13	2.83	2.83	2.83	.71
10	1.03	1.13	1.01	1.05	1.13	1.00	1.15	1.00	7.07	7.07	5.30	1.41
13	1.13	1.94	1.10	1.28	1.12	1.54	1.16	1.23	8.67	2.32	1.37	1.64
14	1.28	1.94	1.34	1.66	1.75	1.51	1.59	1.70	13.88	14.00	15.10	3.65
31	1.29	2.11	1.33	1.88	2.94	2.69	1.74	3.91	14.00	9.00	10.75	1.68

Table 6C.--Errors of the average concentrations given in table 5C

[The values for MgO, total and carbonate carbon, and dolomite are standard errors; all other values are geometric errors]

Region no.	State	No. of samples	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	Total C	Organic C	Carbonate C
1	N. Wyoming	16	1.48	1.26	1.19	0.50	1.02	1.30	1.37	1.41	0.21	1.21	0.21
2	SW. New Mexico	16	3.40	2.04	1.17	1.81	1.02	1.09	3.04	3.74	.52	1.18	.58
3	E. California	16	1.90	1.51	1.64	2.30	1.05	1.34	1.71	2.39	.55	1.54	.59
4	S. Nevada	16	2.08	1.61	1.29	.34	1.01	1.13	1.73	1.83	.15	1.29	.15
5	W.-Central Utah	16	1.97	1.41	1.19	.30	1.02	1.16	1.58	1.35	.14	1.21	.15
6	Central Nevada	16	2.43	1.50	1.53	.22	1.01	1.20	1.76	2.02	.11	1.26	.12
7	NE. Nevada	16	1.55	2.11	1.69	2.75	1.23	1.93	2.46	2.56	1.14	1.52	1.18
8	E.-Central Idaho	16	9.97	4.05	1.96	6.98	1.14	1.27	4.62	7.55	2.28	1.64	2.32
9	SE. Idaho-Utah	16	1.67	1.74	1.20	.26	1.02	1.07	1.94	2.09	.17	1.14	.17
10	W.-Central Wyoming	16	1.46	1.29	1.14	2.49	1.06	1.17	1.22	1.68	.19	1.17	.19
11	SW. Montana	16	1.20	1.16	1.16	.11	1.01	1.08	1.63	1.33	.11	1.31	.16
12	N.-Central Montana	8	2.20	1.22	1.35	3.43	1.09	1.34	1.72	1.95	.35	1.20	.36
13	W. South Dakota	10	3.80	1.72	2.22	1.49	1.09	1.19	2.89	2.21	.95	1.21	.95
14	S.-Central Colorado	16	2.05	1.80	1.27	.38	1.02	1.08	2.78	2.20	.26	1.16	.26

	As	Ba	Br	Hg	Mn	Sr	U	Zn	Illite	Total clay	Quartz	Dolomite
1	1.16	2.10	1.34	1.11	1.54	1.14	1.12	1.53	1.52	1.57	1.72	1.70
2	1.62	1.61	1.22	1.15	1.36	1.23	1.32	2.84	2.81	2.13	4.44	7.96
3	1.79	1.93	2.04	1.43	1.42	1.42	1.44	1.64	2.12	2.45	5.04	15.00
4	1.19	1.42	1.20	1.14	1.32	1.36	1.29	1.16	1.82	1.90	2.22	1.37
5	1.40	1.31	1.16	1.20	1.19	1.31	1.35	1.12	2.05	2.05	2.35	1.38
6	1.64	1.67	1.29	1.52	1.33	1.30	1.36	1.28	1.78	1.63	2.83	.85
7	2.19	2.15	1.23	2.38	1.20	1.99	1.57	1.28	1.92	2.00	1.58	14.08
8	1.36	5.71	2.28	1.81	1.22	2.31	1.90	1.45	3.74	4.17	24.11	34.60
9	1.53	1.35	1.21	1.15	1.25	1.14	1.38	1.13	2.02	1.76	1.58	.62
10	1.53	1.39	1.43	1.16	1.15	1.55	1.22	1.12	1.25	1.17	2.46	12.01
11	1.40	1.24	1.22	1.15	1.12	1.10	1.52	1.18	3.58	1.30	2.63	.27
12	2.23	1.39	1.86	1.09	1.46	1.44	1.52	1.12	1.61	1.34	5.01	18.96
13	1.45	1.63	1.50	2.01	1.67	1.19	1.71	1.70	3.02	1.71	4.43	7.38
14	1.54	1.48	1.13	1.36	1.23	1.20	1.28	1.39	2.86	1.79	2.68	1.21

Table 7A.--Variance components in compositional data on 176 sandstones[1] from the Tippecanoe sequence in the Western U.S.

Variance components

[Values in parentheses are percentages of the total variance. * indicates statistical significance at 0.05 probability, ** at 0.01; some tests were performed on pooled variance estimates]

Oxide, element, or mineral	Total variance (of logs except where noted)	Between provinces σ_a^2 >250 mi	Between regions σ_b^2 50-250 mi	Between areas σ_c^2 10-50 mi	Between sections pairs σ_d^2 2-10 mi	Between sections σ_e^2 0-2 mi	Between samples σ_f^2	Between analyses[3] σ_g^2	Vm[4]
SiO_2--------	382.50[2]	0.0 (0)	213.3 (56**)	42.29 (11**)	27.83 (7)	74.87 (20*)	23.82 (6)	0.58 (0)	5.5
Al_2O_3-------	.2971	.0441 (15)	.0859 (29*)	.0403 (14**)	0.0 (0)	.0493 (17**)	.0703 (23)	.0072 (3)	4.2
Fe_2O_3-------	.4083	.1105 (27**)	.0452 (11)	.0766 (19**)	0.0 (0)	.0635 (16**)	.1036 (25)	.0090 (3)	2.9
MgO---------	.9444	.0447 (5)	.4419 (47**)	.0594 (6)	0.0 (0)	.1626 (17**)	.2109 (22)	.0249 (3)	7.5
CaO---------	1.1641	0.0 (0)	.6001 (52**)	.0142 (1)	.0178 (2)	.1398 (12*)	.3715 (32)	.0206 (2)	11.2
K_2O---------	.7808	.2069 (26*)	.1206 (15)	.1892 (24**)	.0072 (1)	.1041 (13**)	.1478 (19)	.0049 (1)	2.8
TiO_2--------	.3552	.1442 (41*)	.0657 (18**)	.0240 (7)	.0393 (11**)	0.0 (0)	.0626 (18)	.0195 (5)	7.8
P_2O_5--------	.2059	.0022 (1)	.0465 (23**)	.0090 (4)	0.0 (0)	.0404 (20*)	.0844 (41)	.0234 (11)	2.5
Total S-----	.2895	.0181 (6)	.0419 (14*)	.0002 (0)	0.0 (0)	.0887 (31**)	.0767 (27)	.0639 (22)	3.3
Total C-----	.8791	0.0 0)	.4312 (49**)	.0068 (1)	0.0 (0)	.1025 (12*)	.2162 (25)	.1225 (14)	11.5
As----------	.4129	0.0 (0)	.0612 (15)	.0681 (16*)	.0297 (7)	.0960 (23**)	.1199 (29)	.0380 (9)	1.0
Ba----------	.3177	.0030 (1)	.1178 (37*)	.0790 (25**)	0.0 (0)	.0384 (12**)	.0668 (21)	.0127 (4)	2.4
Ge----------	.0418	.0023 (6*)	.0024 (6)	0.0 (0)	.0049 (12)	.0088 (21*)	.0118 (28)	.0116 (28)	1.2
Hg----------	.1632	.0305 (19*)	0.0 (0)	.0557 (34**)	0.0 (0)	.0072 (4)	.0453 (28)	.0244 (15)	0.9
Mn----------	.6103	.0648 (11)	.1264 (21**)	.0513 (8)	0.0 (0)	.1120 (18**)	.2033 (33)	.0525 (9)	3.4
U-----------	.2655	.0964 (36)	.0739 (28**)	.0074 (3*)	.0119 (4)	0.0 (0)	.0618 (23)	.0140 (6)	14.9
Zr----------	.4883	.0561 (11)	.2024 (41**)	.0854 (18**)	0.0 (0)	.0145 (3)	0.0 (0)	.1303 (27)	2.1
Illite------	8.2986[2]	0.0 (0)	1.8333 (22**)	0.0 (0)	1.1692 (14**)	.3967 (5)	4.7980 (58)	.1014 (1)	2.8
Total clay--	.3169[2]	.0419 (13*)	.0488 (15)	.0655 (21**)	.0131 (4)	.0321 (10*)	.1008 (32)	.0146 (4)	1.9
Quartz------	389.84[2]	0.0 (0)	194.08 (50**)	58.152 (15**)	29.101 (7)	80.687 (21**)	27.538 (7)	.2750 (0)	4.0

[1] Eureka sandstones from major localities only; no Watson Ranch, minor localities, or duplicates.
[2] Variance of percentage data, not logarithms.
[3] Calculated from duplicate analyses of 20 samples.
[4] Ratio of variance between regions to variance of region means. See text for explanation.

Table 7B.--Variance components in compositional data on shales[1] from the Tippecanoe sequence in the Western U.S.

[Values in parentheses are percentages of the total variance. * indicates statistical signifiance at 0.05 probability, ** at 0.01; some tests were performed on pooled variance estimates]

Oxide, element, or mineral	Total variance (of logs except where noted)	Variance components						
		Between provinces σ_a^2 >250 mi	Between regions σ_b^2 50-250 mi	Between areas σ_c^2 10-50 mi	Between sections pairs σ_d^2 2-10 mi	Between sections σ_e^2 0-2 mi	Between samples σ_f^2	Between analyses σ_g^2
SiO_2--------	344.24[2]	113.85 (33)	0.0 (0)	no degrees of freedom	0.0 (0)	17.36 (5)	208.24 (60)	4.79 (2)
Al_2O_3-------	67.68[2]	43.46 (64**)	.0 (0)		1.26 (2)	3.31 (5)	18.53 (27)	1.14 (2)
Fe_2O_3-------	.3358	.1401 (42**)	.0 (0)		.0500 (15)	.0 (0)	.1450 (43)	.0006 (0)
MgO---------	.2677	.1461 (54**)	.0 (0)		0.0 (0)	.0729 (27*)	.0443 (16)	.0044 (2)
CaO---------	.8852	.4274 (48**)	.0 (0)		.0 (0)	.0494 (6)	.4078 (46)	.0006 (0)
Na_2O--------	.1098	.0461 (42)	.0 (0)		.0292 (27*)	.0013 (1)	.0312 (28)	.0021 (2)
K_2O---------	8.47[2]	3.55 (42)	.0 (0)		2.18 (26*)	.32 (4)	2.42 (29)	.003 (0)
TiO_2--------	.1901	.0541 (28*)	.0 (0)		.0347 (18)	.0243 (13)	.0766 (41)	.0004 (0)
F-----------	.3021	.1346 (45)	.0 (0)		.0120 (4)	.1221 (40**)	.0272 (9)	.0061 (2)
Total C-----	.4763	.2137 (45*)	.0 (0)		.0 (0)	.1401 (29*)	.1085 (23)	.0139 (3)
Organic C---	.2175	.0431 (20)	.0 (0)		.0663 (30*)	.0 (0)	.1074 (50)	.0007 (0)
As----------	.2933	.0919 (31)	.0255 (9)		.0 (0)	.0942 (32*)	.0514 (18)	.0303 (10)
B-----------	.5268	.2119 (40)	.0 (0)		.1590 (30**)	.0442 (8)	.1053 (20)	.0063 (1)
Ba----------	.4868	.0740 (15)	.0 (0)		.2619 (54**)	.0487 (10)	.0961 (20)	.0061 (1)
Be----------	.1586	.0496 (31)	.0 (0)		.0 (0)	.0857 (54**)	.0162 (10)	.0071 (5)
Co----------	.4461	.1415 (32)	.0 (0)		.0765 (17)	.1345 (30*)	.0746 (18)	.0169 (3)
Cr----------	.1358	.0425 (31)	.0 (0)		.0 (0)	.0368 (27)	.0538 (40)	.0027 (2)
Cu----------	.2819	.1498 (53**)	.0 (0)		.0478 (17)	.0 (0)	.0622 (22)	.0221 (8)
Ga----------	.1392	.0710 (51**)	.0 (0)		.0 (0)	.0215 (15)	.0386 (28)	.0081 (6)
Ge----------	.0878	.0182 (21*)	.0 (0)		.0 (0)	.0213 (24)	.0446 (51)	.0038 (4)
Hg----------	.1949	.1046 (54**)	.0121 (6)		.0 (0)	.0206 (11)	.0511 (27)	.0066 (3)
Li----------	.2145	.0409 (19)	.0250 (12)		.0092 (4)	.0751 (35*)	.0633 (30)	.0010 (0)
Mn----------	.3362	.1430 (43)	.0 (0)		.0011 (0)	.1137 (34*)	.0671 (20)	.0113 (3)
Nb----------	.1105	.0196 (18)	.0 (0)		.0 (0)	.0517 (47*)	.0240 (21)	.0152 (14)
Ni----------	.1859	.0424 (23)	.0 (0)		.0871 (47**)	.0126 (7)	.0359 (19)	.0078 (4)
Pb----------	.3460	.1470 (42**)	.0 (0)		.0179 (5)	.0644 (19)	.1141 (34)	.0026 (0)
Rb----------	.5442	.1198 (22)	.0 (0)		.2752 (51**)	.0 (0)	.1302 (23)	.0191 (4)
Sc----------	.1945	.0666 (34)	.0 (0)		.0 (0)	.0967 (50**)	.0274 (14)	.0039 (2)
Se----------	.1822	.0775 (43**)	.0 (0)		.0082 (4)	.0 (0)	.0772 (43)	.0193 (10)
Sn----------	.0876	.0273 (31)	.0 (0)		.0 (0)	.0404 (46**)	.0045 (5)	.0153 (18)
Sr----------	.4366	.2568 (59**)	.0 (0)		.0075 (2)	.0 (0)	.1609 (36)	.0115 (3)
Th----------	.1876	.0833 (44**)	.0 (0)		.0 (0)	.0 (0)	.0544 (29)	.0499 (27)
U-----------	.2235	.0431 (19)	.0 (0)		.0951 (43)	.0439 (20*)	.0411 (18)	.0002 (0)
V-----------	.6460	.0952 (15)	.0 (0)		.3423 (53)	.1435 (22**)	.0558 (9)	.0091 (1)
Y-----------	.1524	.0493 (32*)	.0 (0)		.0076 (5)	.0673 (44**)	.0133 (9)	.0148 (10)
Zn----------	.2006	.0821 (41**)	.0 (0)		.0163 (8)	.0360 (18)	.0658 (33)	.0003 (0)
Zr----------	.3593	.1258 (35*)	.0 (0)		.0 (0)	.1088 (30*)	.1055 (30)	.0191 (5)
Illite------	986.5[2]	563.1 (57**)	33.83 (3)		.0 (0)	84.62 (9)	298.7 (30)	6.2 (1)
Total clay--	940.6[2]	491.8 (52**)	.0 (0)		.0 (0)	196.7 (21)	237.9 (25)	14.2 (2)
Quartz------	848.4[2]	375.8 (44**)	.0 (0)		.0 (0)	49.90 (6)	413.9 (49)	8.7 (1)
K-feldspar--	66.79[2]	13.70 (21)	.0 (0)		36.56 (55**)	4.769 (7)	8.706 (13)	3.045 (5)

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[1] All shale samples from major localities and minor locality no. 31; no duplicates.
[2] Variance of percentage data, not logarithms.
[3] Calculated from duplicate analyses of 10 samples.

Table 7C.--Variance components in compositional data on 210 carbonates[1] from the Tippecanoe sequence in the Western U.S.

Variance components

[Values in parentheses are percentages of the total variance. * indicates statistical signifiance at 0.05 probability, ** at 0.01; some tests were performed on pooled variance estimates]

Oxide, element, or mineral	Total variance (of logs except where noted)	Between provinces σ_a^2 >250 mi	Between regions σ_b^2 50-250 mi	Between areas σ_c^2 10-50 mi	Between sections pairs σ_d^2 2-10 mi	Between sections σ_e^2 0-2 mi	Between samples σ_f^2	Between analyses[3] σ_g^2	Vm[4]
SiO_2--------	0.6257	0.0973 (16)	0.0 (0)	0.2286 (37**)	0.0668 (11**)	0.0005 (0)	0.2228 (36)	0.0098 (1)	0.7
Al_2O_3-------	0.3321	0.0822 (25*)	0.0 (0)	0.1046 (32**)	0.0123 (4)	0.0 (0)	0.1183 (36)	0.0147 (4)	1.3
Fe_2O_3-------	0.2215	0.0486 (22)	0.0565 (26**)	0.0199 (9)	0.0157 (7*)	0.0 (0)	0.0774 (35)	0.0034 (1)	5.5
MgO---------	34.32[2]	10.90 (32**)	0.0339 (0)	8.361 (24**)	0.0 (0)	4.504 (13**)	10.42 (31)	0.1108 (0)	2.0
CaO---------	0.0067	0.0	0.0002 (3)	0.0 (0)	0.0025 (37**)	0.0009 (13*)	0.0030 (45)	0.0001 (2)	0.2
Na_2O--------	0.0666	0.0016 (2)	0.0 (0)	0.0098 (15)	0.0079 (12*)	0.0035 (5)	0.0304 (46)	0.0134 (20)	0.2
K_2O---------	0.5130	0.0867 (17*)	0.0 (0)	0.1798 (35**)	0.0258 (5)	0.0 (0)	0.1900 (37)	0.0307 (5)	0.8
TiO_2--------	0.7548	0.1654 (22*)	0.0 (0)	0.2114 (28**)	0.0146 (2)	0.0 (0)	0.3416 (45)	0.0219 (3)	1.3
Total C-----	2.8065[2]	0.7590 (27**)	0.0 (0)	0.8696 (31**)	0.3255 (12**)	0.1624 (6*)	0.6499 (23)	0.0450 (2)	1.3
Organic C---	0.0943	0.0136 (14*)	0.0 (0)	0.0099 (10**)	0.0080 (8)	0.0 (0)	0.0 (0)	0.0643 (67)	1.2
Carbonate C-	2.9141[2]	0.7909 (27**)	0.0 (0)	0.9297 (32**)	0.3035 (10*)	0.1837 (6*)	0.6602 (23)	0.0461 (1)	1.3
As----------	0.2916	0.0195 (7)	0.0554 (19**)	0.0 (0)	0.0326 (11*)	0.0 (0)	0.0750 (26)	0.1092 (37)	3.8
Ba----------	0.5820	0.1547 (27**)	0.1058 (18)	0.0771 (13**)	0.0372 (6)	0.0568 (10**)	0.1157 (20)	0.0347 (6)	4.0
Br----------	0.1623	0.0363 (22**)	0.0251 (15)	0.0257 (16*)	0.0174 (11**)	0.0 (0)	0.0482 (30)	0.0097 (6)	2.9
Hg----------	0.0936	0.0057 (6)	0.0 (0)	0.0341 (36**)	0.0046 (5)	0.0053 (6)	0.0271 (28)	0.0168 (19)	0.3
Mn----------	0.1760	0.0592 (34)	0.0513 (29**)	0.0089 (5)	0.0101 (6**)	0.0013 (1)	0.0352 (20)	0.0099 (6)	15.1
Sr----------	0.2020	0.0505 (25)	0.0237 (12*)	0.0076 (4)	0.0244 (12**)	0.0107 (5)	0.0766 (38)	0.0085 (4)	4.6
U-----------	0.1351	0.0 (0)	0.0075 (6)	0.0187 (14**)	0.0028 (2)	0.0194 (14)	0.0670 (50)	0.0198 (14)	0.4
Zn----------	0.1394	0.0318 (23*)	0.0026 (2)	0.0403 (29**)	0.0144 (10*)	0.0114 (8*)	0.0286 (21)	0.0102 (7)	1.2
Illite------	0.6121	0.1054 (17*)	0.0 (0)	0.1901 (31**)	0.0364 (6*)	0.0 (0)	0.2494 (41)	0.0308 (5)	0.9
Total clay--	0.4359	0.0750 (17*)	0.0 (0)	0.1279 (29**)	0.0217 (5)	0.0 (0)	0.1988 (46)	0.0125 (2)	0.9
Quartz------	1.1709	0.1543 (13)	0.0 (0)	0.3336 (28*)	0.2347 (20**)	0.0308 (3)	0.3676 (31)	0.0498 (5)	0.6
Dolomite----	816.10[2]	244.49 (30**)	0.0 (0)	221.68 (27**)	0.5827 (0)	87.165 (11*)	261.48 (32)	0.6272 (0)	1.8

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[1] From major localities only; no minor localities or duplicates.
[2] Variance of percentage data, not logarithms.
[3] Calculated from duplicate analyses of 20 samples.
[4] Ratio of variance between regions to variance of region means. See text for explanation.

Table 8.--Concentration of elements and minerals in the transgressive Tippecanoe sandstone of the Eureka Quartzite and the regressive Sauk sandstone of the Watson Ranch Quartzite

Element or mineral	Lower limit of detection	Substitutions		Mean		Deviation of differences	Degrees of freedom	Significance (p<)
		L	N	Tipp. (Eu)	Sauk (WR)			
SiO_2[1]	0.1	99.5[2]		94.13	82.07	3.70	14	0.005
Al_2O_3	.03	--		.32	.58	.25	14	.025
Fe_2O_3	.007	--		.067	.28	.32	14	.0005
MgO	.002	--		.16	.71	.69	14	.025
CaO	.003	--		.19	2.16	.55	14	.0005
Na_2O	.01	0.005		.0066	.011	.21	11	.01
K_2O	.005	--		.053	.16	.49	14	.025
TiO_2	.001	--		.013	.019	.20	14	.1
P_2O_5	.01	0.007		.021	.043	.37	14	.05
F	.04	0.01		.0077	.014	.39	4	.01
T-S%	.0007	0.0005		.0037	.0078	.22	14	.0025
T-C%	.01	0.005		.13	.67	.47	14	.0025
Org.-C	.01	0.005		.016	.056	.46	14	.05
Carb.-C	.01	0.005		.069	.61	.73	14	.01
As	.1	0.07		.79	1.16	.53	14	.25
B	20.	10.	5.	9.92	12.70	.16	13	.05
Ba	2.	--		18.64	38.02	.31	14	.025
Br	.5	.1		.19	.33	.24	14	.025
Cr	1.	0.7	0.7	1.31	2.88	.31	14	.025
Cu	1.	0.7	0.5	1.64	2.75	.42	14	.25
Ge[1]	.1	0.03		.536	.540	.08	14	<.4
Hg	.01	0.007		.017	.030	.26	14	.05
Mn	1.	0.7	0.5	6.72	48.57	.41	14	.0005
Ni	5.	3.	1.	6.48	7.07	.21	11	.4
Rb	5.	2.		4.55	7.66	.20	14	.01
Se	.1	.05		.12	.16	.26	14	.25
Sn	.1	.05		.088	.072	.36	13	.4
Sr	5.	3.	1.	2.14	11.68	.30	14	.0005
Th	1.	0.5		.57	.71	.28	9	.25
U	.1	0.5		.34	.55	.20	14	.025
V	7.	5.	2.	3.76	5.21	.14	14	.025
Y	10.	3.	3.	2.97	3.36	.44	6	.4
Yb	1.	.3	.3	.26	.31	.53	5	.25
Zn	5.	2.		3.55	6.84	.21	14	.005
Zr	10.	5.	5.	23.51	38.00	.31	14	.1
Musc.-I	.1		.07	.85	1.56	.30	14	.05
Tot. Clay	.1		.05	.94	1.64	.27	14	.05
Quartz[1]	.2			66.03	79.73	3.9	14	.025
K-Spar	.05		.02	.034	.16	.85	11	.025
Calcite	.1		.05	.051	.31	.50	11	.0005
Dolomite	.1		.05	.205	1.14	.91	14	.05
Hematite	.05		.01	.0026	.016	.39	7	.0005
Goethite	.05		.01	.013	.029	.85	9	.1
Apatite	.2		.01	.0061	.015	.43	3	.0025

[1] Normal distribution; all others log normal.

[2] Substituted for upper limit of greater than 99 percent.

Appendix 1.--Sample descriptions and references

[In the sample numbers, the first number is of the region, the first letter is of the section, the next letter indicates lithology--S, sandstone or quartzite; H, shale; C, carbonate--and the last letter indicates position--L, lower; U, upper. All samples are fine grained unless otherwise noted.]

Sample Number	Description and references
1A-D	Southern Bighorn Mountains, Wyoming; Hose (1955)
1A	NW1/4NE1/4 sec. 8, T. 47 N., R. 82 W. on the north wall of the Middle Fork of Crazy Woman Creek; Robinson Canyon 7 1/2' Quad.
1ASL	Sandstone, mottled purple and white; 46 ft above base of 62 ft Harding Standstone
1ASU	Sandstone, pale-purple, calcareous; 57 ft above base of Harding Sandstone
1ACL	Dolomite, mottled green, pale-purple, and a few red spots, very hard; 88 ft above base of 300 ft Bighorn Dolomite
1ACU	Dolomite like 1ACL but no red spots; 154 ft above base of Bighorn Dolomite
1BS	Both in NE. corner of SE1/4 sec. 35, T. 48 N., R. 84 W. on the south side of Bald Hill, Hazelton 7 1/2' Quad.
1BSL	Sandstone, white with some red mottling, thick-bedded; 5 ft above base of 90 ft Harding Sandstone
1BSU	Sandstone, white, slightly calcareous, very hard; 44 ft above the base of Harding Sandstone
1C	Sec. 32 T. 49 N., R. 83 W. (unsurveyed) Klondike Ranch 7 1/2' Quad. The sandstones came from SE1/4SW1/4 of sec. 32 about 300 ft south of the road and the dolomites from NE1/4SW 1/4 of sec 32 about 300 ft north of the road
1CSL	Sandstone, white with purple mottling, massive, slightly calcareous; from 24 ft above base of an estimated 50 ft partly exposed Harding Sandstone
1CSU	Sandstone like 1CSL; 49 ft above base of Harding Sandstone
1CCL	Dolomite, mottled buff, gray, and purple; from 81 ft above base of an estimated 300 ft Bighorn Dolomite
ICCU	Dolomite, tan with minor gray mottling; from lower part of poorly exposed area above main Bighorn cuesta, estimated 251 ft above base.
1D	NE1/4SW1/4 sec. 28, T. 49 N., R. 83 W. Klondike Ranch 7 1/2' Quad.; in cliffs south of road along the North Fork of Crazy Woman Creek
1DSL	Sandstone, fine-grained, white, friable, massive; 33 ft above base of 64 ft Harding Sandstone and 1 ft below top of Hose's (1955, p. 112) unit 3
1DSU	Sandstone, fine-grained, mottled green and purple, massive; 54 ft above base of Harding Sandstone from Hose's (1955, p. 112) unit 8
1DCL	Dolomite, tan with purple spots, massive; 25 ft above base of Bighorn

	Dolomite
1DCU	Dolomite, tan, massive; from 70 ft above base of Bighorn Dolomite
1E-H	Northern Bighorn Mountains, Wyoming; locations mainly from Darton's (1906) map transferred to 7 1/2' topographic quadrangles
1E	South slope of ridge north of Rapid Creek in NE. corner of SW1/4SW1/4 sec. 12, T 54 N., R. 86 W., Beckton 7 1/2' Quad.
1ESL	Sandstone, white, slightly calcareous; 21 ft above base of 35 ft Harding Sandstone
1ESU	Sandstone like 1ESL but noncalcareous; 24 ft above base of Harding Sandstone
1ECL	Dolomite, mottled tan and gray, vitreous, scattered chert (not included); 45 ft above base of 300 ft Bighorn Dolomite
1ECU	Dolomite like 1ECL but more tan; 77 ft above base of Bighorn Dolomite
1F	0.6 mi up Big Goose Creek from the Sheridan Water Filtration Plant. Sandstones are from east of the Creek and just south of the Forest boundary in NE1/4NE1/4 sec. 3, T. 54 N., R. 86 W.; dolomites are from west bank of Creek about 500 ft north of the Forest Boundary in SE1/4SE1/4 sec. 34, T. 55 N., R. 86 W., Beckton 7 1/2' Quad.
1FSL	Sandstone, white, calcareous; 9 ft above base of exposed 15 ft of Harding Sandstone
1FSU	Sandstone like 1FSL; 13 ft above base of Harding Sandstone
1FCL	Dolomite, mottled tan and gray with some limonite spots and small blebs of chert; 167 ft above base of 300 ft Bighorn Dolomite.
1FCU	Dolomite like 1FCL but no chert, fairly vitreous; 200 ft above base of Bighorn Dolomite
1G	SW1/4SE1/4 sec. 21, T. 56 N., R. 87 W. in roadcuts on the north side of U.S. Highway 14, Dayton South 7 1/2' Quad.
1GSL	Sandstone, white, friable, slightly calcareous; 6 ft above base of 10 ft exposed Harding Sandstone separated by a 25 ft covered area from the lowest Bighorn Dolomite
1GSU	Sandstone like 1GSL; 8 ft above base of Harding Sandstone
1GCL	Dolomite, tan, massive, very dense, cherty (not included); 192 ft above base of 300 ft Bighorn Dolomite, near top of massive part
1GCU	Dolomite, mottled gray and brown, thin-bedded; 222 ft above base of Bighorn Dolomite in the Leigh Member
1H	Near foot trail north of Tongue River, Dayton South 7 1/2' Quad.
1HSL	Sandstone, very fine grained, white, crossbedded; 12 ft above base of 47 ft Harding Sandstone in SW. corner of SE1/4 sec. 4, T. 56 N., R. 87 W.
1HSU	Sandstone like 1HSL; 21 ft above base of Harding Sandstone
1HCL	Dolomite, mottled tan and gray, massive, cherty (not included); 71 ft above base of 300 ft Bighorn Dolomite (about 300 ft NNE. up the slope from sandstones)
1HCU	Dolomite like 1HCL but not cherty; 132 ft above base of Bighorn Dolomite along the foot trail in NE1/4NW1/4 sec. 10, T. 56 N., R. 87

	W., about 1,100 ft west of Tongue River Campground
2A-D	Caballo Mountains, New Mexico; Kelly and Silver (1952)
2AS	About 500 ft east of SW. corner of sec. 21, T. 16 S. R. 4 W. and 1,000 ft south of Apache Canyon road, Caballo 7 1/2' Quad.
2ASL	Sandstone, medium-grained, white, friable; 10 ft above base of 40 ft Cable Canyon Sandstone
2ASU	Sandstone, medium-grained, mottled white, buff, and pale-purple, friable, slightly calcareous; 30 ft above base of Cable Canyon Sandstone
2AC	Apache Canyon, about 3 mi east of 2AS locality, in NE1/4SW1/4 sec. 24, T. 16 S., R. 4 W., Upham 15' Quad.
2ACL	Dolomite, medium-gray; 152 ft above base of 330 ft Montoya Dolomite in lower part of upper white cherty part of the Aleman Cherty Member
2ACU	Dolomite like 2ACL; 191 ft above base of Montoya Dolomite, in lower part of Cutter Dolomite Member
2B	Cable Canyon, about 3,000 ft NE. of Sierrite Mine; in cliffs and steep slopes on north side of canyon near NE. corner of SE1/4, sec. 10, T. 16 S., R. 4 W., Upham 15' Quad; measured section in Kelly and Silver (1952, p. 258)
2BSL	Sandstone, coarse-grained, light-bluff, very hard; from 3 ft above base of 35 ft Cable Canyon Sandstone
2BSU	Sandstone, very coarse-grained, light-buff; 34 ft above base of Cable Canyon Sandstone
2BCL	Dolomite, medium-gray, thick-bedded, slightly cherty; 64 ft above base of 330 ft Montoya Dolomite, 14 ft below top of Upham Dolomite Member
2BCU	Dolomite, light-gray with small pink patches, medium-bedded; 212 ft above base of Montoya Dolomite, and 24 ft above base of Cutter Dolomite Member
2C	Steep slopes above Victoria Mine, SE1/4SE1/4 sec.3, T. 15 S., R. 4 W., Engle 15' Quad.; section in Kelly and Silver (1952, p. 253)
2CSL	Sandstone, medium-grained with some coarse grains, white, weathers dark-brown, calcareous; base of 25 ft Cable Canyon Sandstone
2CSU	Sandstone like 2CSL but more calcareous; 17 ft above base of Cable Canyon Sandstone
2CCL	Dolomite, dark-gray, very tough; 84 ft above base of 330 ft Montoya Dolomite, from a low-chert bed 9 ft above base of Aleman Cherty Member
2CCU	Dolomite, medium-gray; 178 ft above base of Montoya Dolomite; this level should be in the upper Aleman Member, but it looks like lower Upham Dolomite Member
2D	SW. corner of sec. 34, T. 14 S., R. 4 W., in steep slope above the Victoria Mine-Palomas Gap Road
2DSL	Sandstone, quartzitic, fine- to medium-grained, white, massive, slightly calcareous; 8 ft above base of 15 ft Cable Canyon Sandstone

2DSU	Sandstone, quartzitic, fine- to medim-grained, white, massive, slightly calcareous; 8 ft above base of 15 ft Cable Canyon Sandstone
2DCL	Dolomite, medium-gray, massive, numerous chert bands (not sampled); 78 ft above base of 390 ft Montoya Dolomite and 13 ft above base of the Aleman Cherty Member
2DCU	Dolomite like 2DCL but medium-dark-gray; 170 ft above base of Montoya Dolomite and 105 ft above base of Aleman Cherty Member
2E-F	Lone Mountain, New Mexico; Hurley West 7 1/2' Quad.; Pratt (1967)
2-E	All but upper carbonate from the southeast slope of the south knob of Lone Mountain in SE1/4NE1/4 sec. 33, T. 18 S., R. 13 W.; Pratt and Jones (1961, p.497, section C)
2ESL	Sandstone, medium- to coarse-grained, medium-brownish-gray, calcareous; 1 ft above the base of 16 ft Cable Canyon Sandstone
2ESU	Sandstone, medium-grained, light-gray, slightly calcareous; 5 ft above base of Cable Canyon Sandstone
2ECL	Dolomite, medium-gray; 246 ft above base of 336 ft Montoya Dolomite near middle of the Cutter Dolomite Member
2ECU	Dolomite like 2ECL; 244 ft above base of the Fusselman Dolomite on the east side of the south knob of Lone Mountain in SW1/4NE1/4NW1/4, T. 18 S., R. 13 W., in a broad gulch about 250 ft east of the road
2F	On south side of northwesternmost of three peaks of Lone Mountain in SE1/4SW1/4NW1/4 sec. 28, T. 18 S., R. 13 W.
2FSL	Sandstone, medium-grained, medium-gray, thick-bedded, patches of chert stand in relief 4 ft above base of 16 ft Cable Canyon Sandstone
2FSU	Sandstone, fine- to-medium grained, medium-gray, slightly calcareous; 8 ft above base of Canyon Sandstone
2FCL	Dolomite, fine-grained, dark-gray, numerous chert layers; 74 ft above base of 336 ft Montoya Dolomite and 21 ft above base of Aleman Cherty Member
2FCU	Dolomite like 2FCL, some vugs filled with calcite; 14 ft above base of Fusselman Dolomite, at the top of the peak
2G-H	Silver City 7 1/2' Quad. near the Bear Mountain Road, about 5 mi NW. of Silver City
2G	In a steep sided ravine in NW1/4NW1/4 sec. 19, T. 17 S., R. 14 W.; Cable Canyon Sandstone not found; John Cunningham (personal communication)
2GCL	Dolomite, medium-gray, thick-bedded; 69 ft above base of 342 ft Montoya Dolomite near the top of Upham Dolomite Member
2GCU	Dolomite like 2GCL; 435 ft above base of Montoya Dolomite and 93 ft above base of the Fusselman Dolomite
2H	Along nose of Ridge on south fact of Bear Mountain below the Bear Mountain Road in NW1/4SW1/4 sec. 14, T. 17 S., R. 15 W.; Pratt and Jones (1961, fig. 7)
2HSL	Sandstone, quartzitic, white with 1/2-1 in. fragments of gray dolomite; from a float block

2HSU	Sandstone like 2HSL; from another float block
2HCL	Dolomite, light- to medium-gray, medium-bedded; 240 ft above base of 493 ft Montoya Dolomite and 97 ft above base of the Cutter Dolomite Member
2HCU	Dolomite, calcareous, fine-grained, medium-grey, medium-bedded; 12 ft above 2HCL in Cutter Dolomite Member

3A-D	Panamint Range on the west side of Death Valley; Hunt and Maybe (1966)

3A-B	Furnace Creek 15' Quad., California; 3A is just south of Trail Canyon Road between 1,200-1,360 ft contours; 3B, lower three samples 2.0 mi NW. of 3A along ridge near 1,988 ft elevation mark about 1/2 mi east of letter "I" in PANAMINT, upper carbonate sample from 0.8 mi north of lower 3B samples, 1/2 mi east of second "A" in PANAMINT near 2,000 ft contour

3ASL	Quartzite, vitreous, slightly calcareous; 102 ft above base of 325 ft Eureka Quartzite
3ASU	Quartzite, like 3ASL; 203 ft above base of Eureka Quartzite
3ACL	Dolomite, dark-gray with white veining; 62 ft above base of 440 ft Ely Springs Dolomite, SW. of rock outcrop nearest the road
3ACU	Dolomite, like 3ACL but without veining; 435 ft above base of Ely Springs Dolomite
3BSL	Quartzite, white, vitreous, 176 ft above base of 300 ft Eureka Quartzite
3BSU	Quartzite, like 3BSL; 268 ft above base of Eureka Quartzite
3BCL	Dolomite, dark-grey; 247 ft above base of 500 ft Ely Springs Dolomite
3BCU	Dolomite, pink, calcareous, friable; 959 ft above base of Ely Springs Dolomite and 459 ft above base of 500 ft Hidden Valley Dolomite

3C-D	North end of Tucki Mountain; Stovepipe Wells 15' Quad., California; rocks are extremely brecciated, and access is difficult except in lower valleys; could not find Eureka Quartzite where geologic map showed it to be

3C	East side of Little Bridge Canyon, SW. corner sec. 10, T. 16 S., R. 45 E.
3CCL	Dolomite, medium-gray, massive; 79 ft above base of 500 ft Ely Springs Dolomite
3CCU	Dolomite, medium-gray with iron staining, thin-bedded; 747 ft adobe base of Ely Springs Dolomite, and 247 ft above base of 750 ft Hidden Valley Dolomite
3D	Grotto Canyon, along ridge on west side of canyon south from the uppermost part of canyon accessible by jeep, NW1/4NE1/4 sec. 17, T. 16 S., R. 45 E.

3DCL	Dolomite, dark-gray; from top of ridge, 179 ft above base of 500 ft Ely Springs Dolomite
3DCU	Dolomite, dark-gray, highly brecciated and veined with calcite; 411 ft above base of Ely Springs Dolomite

3E-H	Inyo Mountains, all on Independence 15' Quad., California; Ross (1966)

3E	Willow Springs Canyon; Ross' (1966) sections VG- and ES-1 and JS- and BS-2 locations were found marked in yellow paint; near adjoining corners secs. 4, 5, 8, and 9, T. 16 S., R. 36 E.
3EHL	Shale, slaty, light-gray; 9 ft above base of Unit 2, BS-2; SW1/4SW1/4 sec. 4
3EHU	Slate, light-tan, very calcareous, soft; dug out 11 ft above the base of unit 2; JS-2, SW1/4SW1/4 sec. 4
3ESL	Quartzite, white, vitreous, calcareous; 3 ft above base of unit 4, JS-2; SW1/4SW1/4 sec. 4
3ESU	Quartzite, white with some iron staining, vitreous; 83 ft above base of unit 9, JS-2; SW1/4SW1/4 sec. 4
3ECL	Dolomite, dark-gray, thin-bedded, cherty (excluded); 191 ft above base of 340 ft Ely Springs Dolomite; NW1/4NW1/4 sec. 9
3ECU	Limestone, dark-gray, thin-bedded; 1,270 ft above base of 1,961 ft Vaughn Gulch Limestone; NE1/4NE1/4 sec. 8

3F	Snowcaps Mine, east ridge of hill 1/4 mi north of Mine in SW. corner of sec. 6, T. 13 S., R. 36 W.
3FHL	Hornfels, dark-green, black weathering, calcareous; 3 ft above base of 157 ft Barrel Springs Formation
3FSL	Quartzite, white with red and black stains on cracks, calcareous; 14 ft above base of Barrel Springs Formation
3FHU	Hornfels, greenish-black, calcareous; from uppermost hornfels seen in Barrel Springs Member
3FSU	Quartzite, white with brown and black stains on cracks; 1 ft above 3FHU
3FCL	Limestone, medium-gray; 4 ft below top of uppermost carbonate bed in Johnson Springs Formation
3FCU	Dolomite, dark-gray, calcareous, concentric (algal) masses several inches across; 43 ft above base of Ely Springs Dolomite

3G	In ridge between Mazourka and Rose Canyons near south edge of sec. 31, T. 11 S., R. 36 E.
3GCL	Limestone, argillaceous, medium-gray, thin- and uneven-bedded; upper part of limestone unit in Ross' (1966) BS-10 section; SE1/4SE1/4 sec. 31
3GSL	Quartzite, light-gray, brown on weathered surface, calcareous; lowest quartzite outcrop of Johnson Springs Member, JS-12
3GSU	Quartzite, white, calcareous, thick-bedded; base of upper quartzite of JS-12, sampled where it comes down to the trail; SE1/4SE1/4 sec. 31
3GCU	Dolomite, sugary texture, medium-gray, thin-bedded; top of lower unit of the Johnson Springs Formation; SE1/4SE1/4 sec. 31

3GHL	Shale, medium-gray; upper part of the Sunday Canyon Formation near section SC-5; SE1/4SW1/4 sec. 31
3GHU	Shale, dark-gray, better bedding than 3GHL; sampled 34 ft above 3GHL

3H	Badger Flat, sec. 25, T. 11 S., R. 35 E.
3HSL	Quartzite, white, thick-bedded, calcareous; 14 ft below top of 85 ft quartzite at section JS-13; SW. corner SE1/4NE1/4 sec. 25
3HSU	Quartzite like 3HSL and from 1 ft above it
3HCL	Dolomite, medium-grained, medium-gray, calcareous; 4 ft above lowest outcrop of dolomite in Johnson Springs Member at JS-13
3HCU	Dolomite, light-gray; from lowest Ely Springs Dolomite seen; SW. corner NW1/4NE1/4 sec. 25
3HHL	Shale, light-gray, calcareous; from roadcut in lower Sunday Canyon Formation at SC-6; center SE1/4 sec. 25
3HHU	Shale like 3HHL but noncalcareous; from 104 ft above 3HHL

4A-D	Arrow Canyon Range; Arrow Canyon 15' Quad., Nevada; Langenheim et al (1962)

4A	Silica Quarry, SW1/4NW1/4 sec. 18, T. 15 S., R. 64 E. (unsurveyed) at end of road leading NW. from Ute railroad siding (Las Vegas 1x2 Quad.)
4ASL	Quartzite, white, thick-bedded, with 1/2 in. soft orange sandstone vugs; 24 ft above base of 100 ft Eureka Quartzite
4ASU	Sandstone, white with light-brown spots, thick-bedded, some cross-bedded, calcareous; 28 ft above base of Eureka Quartzite
4ACL	Dolomite, dark-gray; 80 ft above base of 460 ft Ely Springs Dolomite
4ACU	Dolomite, medium-gray; 124 ft above base of 220 ft Laketown Dolomite

4B	College Canyon, the mouth of which is 1/4 mi east of bend in U.S. Highway 93 in sec. 27, T. 15 S., R. 63 E.
4BS	Quarry on south side of College Canyon
4BSL	Quartzite, white some orange staining; 34 ft above base of 100 ft Eureka Quartzite
4BSU	Quartzite, white with brown streaks parallel to bedding; 94 ft above base of Eureka Quartzite
4BC	3/4 mi north of mouth of College Canyon
4BCL	Dolomite, coarse bioclastic, light-gray; 27 ft above base of 400 ft Ely Springs Dolomite
4BCU	Dolomite, dark-gray, massive; 139 ft above base of Ely Springs Dolomite

4C	London Gulch, about 2 mi east of BM 2414 on U.S. Highway 93
4CSL	Quartzite, white with black stain on surface; 3 ft above base of 100 ft Eureka Quartzite
4CSU	Quartzite like 4CSL; 29 ft above base of Eureka Quartzite
4CCL	Dolomite, dark-gray, massive; 33 ft above base of 500 ft Ely Springs Dolomite
4CCU	Dolomite like 4CCL; 449 ft above base of Ely Springs Dolomite
4D	Reunion Gulch, about 2 mi east of BM 2411 on U.S. Highway 93
4DSL	Quartzite, white, vitreous, thick-bedded; 60 ft above base of 100 ft Eureka Quartzite
4DSU	Sandstone, white, slightly calcareous; 64 ft above base of Eureka Quartzite
4DCL	Dolomite, black, massive, veined with calcite; 302 ft above base of 500 ft Ely Springs Dolomite
4DCU	Dolomite, medium- to light-gray, medium-bedded; 49 ft above base of 330 ft Laketown Dolomite

4E-H	Pahranagat Range, Caliente 1x2° Quad.; Reso (1963), Tschanz and Pampeyan (1961)

4E	West side of Pahranagat Range and 4 mi south of Nevada Highway 25 in sec. 8, T. 7S., R. 59 E.
4ESL	Quartzite, mostly tan, some dark-gray, thin-bedded, calcareous; 12 ft above base of 420 ft Eureka Quartzite in lower unit that may be a regressive Sauk sandstone
4ESU	Sandstone, quartzitic, white, medium-bedded; 359 ft above base of Eureka Quartzite
4ECL	Dolomite, medium- to dark-gray, massive; 359 ft above base of 400 ft Ely Springs Dolomite
4ECU	Dolomite, light-gray, thick-bedded; 579 ft above base of 800 ft Laketown Dolomite
4F	West side of Pahranagat Range and 2-1/2 miles south of Nevada Highway 25 in sec. 35, T. 6 S., R 59 E.
4FSL	Quartzite, vitreous, light-brown; 169 ft above base of 420 ft Eureka Quartzite
4FSU	Quartzite, vitreous, fine-grained, white, thick-bedded; 414 ft above base of Eureka Quartzite
4FCL	Dolomite, dark-gray; 180 ft above base of 400 ft Ely Springs Dolomite
4FCU	Dolomite, fine-grained, light-gray, medium-bedded; 435 ft above base of 800 ft Laketown Dolomite
4G	South end of North Pahranagat Range, north of Nevada Highway 25, near south edge of sec. 21, T. 5 S., R. 58 E.
4GSL	Sandstone, quartzitic, white with some brown mottling, medium-bedded, calcareous; 60 ft above base of 500 ft Eureka Quartzite in what may be a regressive Sauk sandstone
4GSU	Quartzite, vitreous, white, thick-bedded; 290 ft above base of Eureka Quartzite

4GCL	Dolomite, medium-gray, medium-bedded, adjacent beds very cherty; 872 ft above base of 200 ft Ely Springs Dolomite in 1,050 ft Laketown Dolomite
4GCU	Dolomite, dark-brownish-gray, thick-bedded; 1,016 ft above base of Ely Springs Dolomite and 816 ft above base of Laketown Dolomite
4H	About 2 mi north of 4G near the north edge of sec. 15, T. 5 S., R. 58 E.
4HSL	Sandstone, quartzitic, white, thick-bedded, slightly calcareous; 28 ft above lowest of 200 ft exposed Eureka Quartzite
4HSU	Quartzite, vitreous, white, medium-bedded; 96 ft above lowest exposed Eureka Quartzite
4HCL	Dolomite, dark-gray, medium-bedded; 378 ft above base of 250 ft Ely Springs Dolomite and 128 ft above base of 800 ft Laketown Dolomite
4HCU	Dolomite, medium-gray, medium-bedded; 21 ft above 4HCL

5A-D	Southern Pavant Range, SW. of Kanosh, Utah; Crosby (1959), Hintz (1973, chart 34a), Webb (1958)

5A	NW1/4SW1/4 sec. 4, T. 25 S., R. 7 W., Cove Fort 15' Quad.
5ASL	Quartzite, white, massive; 39 ft above base of 137 ft Eureka Quartzite
5ASU	Quartzite like 5ASL; 42 ft above base of Eureka Quartzite
5ACL	Dolomite, dark-gray, brecciated and veined with calcite; 354 ft above base of 1,000 ft Fish Haven Dolomite (top may be Laketown Dolomite)
5ACU	Dolomite, medium-gray, medium-bedded; 950 ft above base of Fish Haven Dolomite near top of the hill
5B	W1/2SW1/4 sec. 35, T. 24 S., R. 7 W.; Cove Fort 15' Quad.
5BSL	Quartzite, white, thick-bedded; 103 ft above base of 165 ft Eureka Quartzite
5BSU	Sandstone, white with brown on fractures; 136 ft above base Eureka Quartzite
5BCL	Dolomite, dark-gray with tiny white calcite veins; 872 ft above base of 1,000 ft Fish Haven Dolomite
5BCU	Dolomite like 5BCL; 951 ft above base of Fish Haven Dolomite
5C	Dameron Canyon; quartzites are from north of road in NE1/4NW1/4 sec. 5 and dolomites from SE1/4NW1/4 sec. 5, T. 24 S., R. 5 W., Fillmore 15' Quad., near the Dameron Deer Pen
5CSL	Quartzite, mostly fine-grained but some coarse grains, pink; 40 ft above base of a 150 ft Eureka Quartzite
5CSU	Quartzite, white with pink streaks, slightly calcareous; 117 ft above base of Eureka Quartzite
5CCL	Dolomite, dark-gray, slickensided; from 247 ft above base of 1,000 ft Fish Haven Dolomite
5CCU	Dolomite like 5CCL; 303 ft above base of Fish Haven Dolomite
5D	Dry Wash, along road on east side in E1/2NW1/4, sec. 4, T. 24 S., R. 5 W., Fillmore 15' Quad.
5DSL	Quartzite, white, massive; 103 ft above base of 150 ft Eureka Quartzite

5DSU	Quartzite like 5DSL; 109 ft above base of Eureka Quartzite
5DCL	Dolomite, medium-grained, medium-gray, medium-bedded; 229 ft above base of 1,000 ft Fish Haven Dolomite in lower part of good outcrop along the road
5DCU	Dolomite like 5DCL; 323 ft above base in upper part of good outcrop along the road

5E-H	Northern Pavant Range and Canyon Mountains near Scipio Pass, Utah; Tucker (1954), Hintz (1973, chart 35), Webb (1956, p. 62)

5E	SE1/4SE1/4 sec. 13, T. 19 S., R. 3 W., Scipio Pass 7 1/2' Quad.
5ESL	Quartzite, white with some iron staining; 13 ft above base of upper ledge and 93 ft above base of 130 ft Eureka Quartzite; center of west edge of SE1/4SE1/4 sec. 13
5ESU	Quartzite like 5ESL and 4 ft stratigraphically above it
5ECL	Dolomite, black, medium-bedded; 557 ft above base of 1,200 ft Fish Haven-Laketown Dolomite; center of W1/2SE1/4 sec. 13
5ECU	Dolomite, light-brownish-gray; 794 ft above base of Fish Haven-Laketown Dolomite; north center of SE1/4SE1/4 sec. 13
5F	Ebbs Canyon, sec. 12, T. 19 S., R. 3 W., Scipio Pass 7 1/2' Quad.
5FSL	Quartzite, white, vitreous; 43 ft above base of 130 ft Eureka Quartzite in NW1/4SE1/4SW1/4 sec. 12
5FSU	Quartzite, white with some pink staining; 108 ft above base of Eureka Quartzite in SE1/4SE1/4SW1/4 sec. 12
5FCL	Dolomite, medium- to dark-gray; 315 ft above base of 1,200 ft Fish Haven-Laketown Dolomite in NW1/4SW1/4SE1/4 sec. 12
5FCU	Dolomite like 5FCL; 965 ft above base of Fish Haven-Laketown Dolomite
5G	Mud Spring; spread out over a mile in the south part of sec. 16 and adjacent sec. 15, T. 18 S., R. 3 W., Scipio Pass 7 1/2' Quad.
5GSL	Sandstone, quartzitic, white with purple mottling; 22 ft above base of 60 ft exposed Eureka Quartzite in SE1/4SE1/4SW1/4 sec. 16
5GSU	Quartzite, white; 44 ft above base of Eureka Quartzite
5GCL	Dolomite, medium-gray, calcite on fractures; 48 ft above base of 1,200 ft Fish Haven-Laketown Dolomite in SE1/4SW1/4SE1/4 sec. 16
5GCU	Dolomite, medium-grained, light-gray, very cherty (not included); from 1,062 ft above base of Fish Haven-Laketown Dolomite in SW1/4NW1/4SW1/4 sec. 15
5H	Fisher Spring in south center of sec. 10, T. 18 S., R. 3 W., Scipio North 15' Quad., about 1/4 mi west of the spring. Sandstones seen are a lower 15 ft brown bed (Watson Ranch) separated by a 10 ft unexposed interval from a 115 ft white quartzite (Eureka) that is poorly exposed 50-90 ft above its base.
5HWL	Sandstone, speckled light-gray and brown, calcareous, uneven medium-bedded; 4 ft above base of Watson Ranch Quartzite
5HWU	Sandstone, brown, thin-bedded, calcareous; 8 ft above base of Watson Ranch Quartzite
5HSL	Quartzite, white, thick-bedded; 47 ft above base of Eureka Quartzite
5HSU	Sandstone, light-gray, slightly calcareous; 71 ft above base of Eureka Quartzite in poorly exposed interval

5HCL	Dolomite, medium-gray, calcite veins; 168 ft above base of 1,200 ft Fish Haven-Laketown Dolomite just below massive cliff
5HCU	Dolomite, light-gray, thick-bedded; 1,171 ft above base of Fish Haven-Laketown Dolomite, about 1,500 ft NW. of lower samples

6A-D	Antelope Valley, Eureka Co., Nevada; Merriam (1963), Ross (1970); note that, unlike other areas, localities A-D are west of E-H

6A	Mahogany Hills, South; the lower three samples are from Wood Cone Peak in NE1/4 sec. 5, T. 17 N., R. 52 E., and the upper dolomite from SW1/4NW1/4 sec. 33, T. 18 N., R. 52 E., Bellevue Peak 15' Quad.
6ASL	Quartzite, vitreous, white with some brown staining, massive but highly fractured, calcareous; 140 ft above base of 200 ft Eureka Quartzite
6ASU	Quartzite like 6ASL; 171 ft above base of Eureka Quartzite
6ACL	Dolomite, dark-gray, calcite veinlets; 4 ft from base of 700 ft Hanson Creek Formation and 2,500 ft carbonate section
6ACU	Dolomite, medium- to light-gray, calcite veinlets; 1,473 ft above base of carbonate section at about top of lower 1/3 of Lone Mountain Dolomite
6B	Mahogany Hills, North; quartzites from W1/2SE1/4 sec. 33, T. 18 N., R. 52 E. and dolomites from NW1/4SW1/4 sec. 24, T. 18 N., R. 51 E., Bellevue Peak 15' Quad.
6BSL	Quartzite, white, massive; 32 ft above base of 200 ft Eureka Quartzite
6BSU	Quartzite like 6BSL; 191 ft above base of Eureka Quartzite
6BCL	Dolomite, very light-gray; 418 ft above base of 700 ft Hansen Creek Formation at top of 6,987 ft hill on quadrangle map
6BCU	Dolomite, dark-gray; 592 ft above base of Hansen Creek Formation, from topographic saddle east of 6BCL
6C-D	Lone Mountain, on the north end of Antelope Valley; Bartine Ranch 15' Quad.; Merriam (1963, p. 28), Webb (1956, p. 60), McFarlane (1955)
6C	South side of Lone Mountain; quartzite and sandstones are from ridge uphill from 6,600 ft contour label in SE corner of NW1/4 sec. 30, T. 20 N., R. 51 E.
6CWL	Quartzite, light-gray, weathers dark-brown, calcareous; 2 ft above base of 20 ft Copenhagen sandstone that immediately underlies the Eureka Quartzite
6CWU	Sandstone, quartzitic, very fine-grained, light-gray, weathering yellow, thin-bedded; 14 ft above base of Copenhagen sandstone
6CSL	Sandstone, quartzitic, red, noncalcareous; from top of 20 ft poorly exposed zone and 41 ft above base of 180 ft Eureka Quartzite
6CSU	Sandstone, quartzitic, white with brown staining, massive; 77 ft above base of Eureka Quartzite
6CCL	Dolomite, dark-gray, thick-bedded; sampled about 50 ft below top of Roberts Mountain Formation and 1,006 ft above base of 2,629 ft carbonate section, which includes 318 ft Hansen Creek Formation, 741 ft Roberts Mountain Formation, and 1,570 ft Lone Mountain Formation (Merriam, 1963, p. 28); SW1/4NW1/4 sec. 29

6CCU	Dolomite, very light-gray; from middle of Lone Mountain Formation 1,726 ft above base of carbonate section; SE1/4NW1/4 sec. 29

6D	West side of Lone Mountain; sandstones and quartzite from SW. corner and dolomites from NE. corner of SW1/4NW1/4 sec. 19, T. 20 N., R. 51 E.; thickness of carbonate formations used is as given in 6CCL
6DWL	Sandstone, very-fine-grained, mottled red and green; base of 20 ft Copenhagen sandstone that immediately underlies the Eureka Quartzite
6DWU	Sandstone, light-gray, medium-bedded; 13 ft above base of Copenhagen sandstone
6DSL	Sandstone, quartzitic, white, thick-bedded; 112 ft above base of 180 ft Eureka Quartzite
6DSU	Quartzite, mostly white, some light-gray, massive; 137 ft above base of Eureka Quartzite
6DCL	Dolomite, dark-gray; about 100 ft above base of Roberts Mountain Formation and 428 ft above base of carbonate section
6DCU	Dolomite, dark-gray, medium-bedded; about 400 ft above base of Roberts Mountain Formation and 773 ft above base of carbonate section

6E-H	North Egan Range (6E-F) and South Cherry Creek Range (6G-H), Nevada; best location map available is Fritz's (1958) 1:62,500 geologic map; Silurian and Ordovician carbonates are not differentiated

6E	SE1/4NW1/4 sec. 12, T. 20 N., R. 62 E.
6ESL	Sandstone, quartzitic, white, massive; 17 ft above base of 150 ft exposed Eureka Quartzite
6ESU	Sandstone like 6ESL; 72 ft above base of Eureka Quartzite
6ECL	Dolomite, dark-gray, medium-bedded, fossiliferous; 38 ft above base of 1,680 ft carbonate section
6ECU	Dolomite, light- to medium-grayed, calcite veining; 1,565 ft above base of carbonate section

6F	SE1/4SE1/4, sec. 34, T. 21 N., R. 62 E.
6FSL	Sandstone, white with pink staining, massive; 7 ft above base of 175 ft Eureka Quartzite
6FSU	Sandstone, quartzitic, white, massive, crossbedded; 113 ft above base of Eureka Quartzite
6FCL	Dolomite, medium-grained, dark-brownish-gray, thick-bedded; 265 ft above base of 1,680 ft carbonate section
6FCU	Dolomite, medium-grained, light-gray, medium-bedded; 1,570 ft above base of carbonate section

6G	NW1/4NW1/4, sec. 2, T. 21 N., R. 61 E.
6GSL	Sandstone, quartzitic, massive; 24 ft above base of 85 ft exposed Eureka Quartzite
6GSU	Sandstone like 6GSL; 37 ft above base of Eureka Quartzite
6GCL	Dolomite, wavy bands of light-gray and brown, thick-bedded; 684 ft above base of 1,680 ft carbonate section
6GCU	Dolomite, dark-gray, thick-bedded with poorly developed thin wavy bedding; 735 ft above base of carbonate section

6H	NE1/4NW1/4 sec. 25, T. 22 N., R. 61 E.
6HWL	Sandstone, fine- to medium-grained, light-tan, medium-bedded, calcareous; 7 ft above base of 10 ft Watson Ranch Quartzite separated from Eureka Quartziite by a 22 ft covered interval
6HWU	Sandstone, white, medium-crossbedded, calcareous; top of exposed Watson Ranch Quartzite
6HSL	Sandstone, quartzitic, medium-bedded; 15 ft above base of 55 ft Eureka Quartzite
6HSU	Sandstone, mottled white and light-gray, calcareous; 26 ft above base of Eureka Quartzite
6HCL	Dolomite, medium- to dark-gray, thick-bedded; 479 ft above base of 1,680 ft carbonate section
6HCU	Dolomite, light-gray, thick-bedded; 667 ft above base of carbonate section

7A-B	Southern Snake Mountains, Nevada; Summer Camp 7 1/2' Quad.; Peterson (1968) gives the following section: 1,500 ft Roberts Mountains Formation/600 ft Hanson Creek Formation/900 ft Eureka Quartzite/Pogonip Formation

7ASL	Quartzite, white, massive; 260 ft above base of Eureka Quartzite in SW1/4SW1/4NW1/4 sec. 5, T. 39 N., R. 62 W.
7ASU	Quartzite like 7ASL; 873 ft above base of Eureka Quartzite in SE1/4SW1/4NW1/4 sec. 5
7ACL	Limestone, dark-gray, thin-bedded; 1,151 ft above base of Hanson Creek Formation and 1/3 of the way up in the Roberts Mountain Formation, at end of Jeep trail in SW1/4SE1/4SE1/4 sec. 32, T. 40 N., R. 62 W.
7ACU	Limestone, medium- to dark-gray, thin-bedded; 1,874 ft above base of Hanson Creek Formation in upper part of Roberts Mountain Formation in NW1/4NE1/4SW1/4 sec. 33, T. 40 N., R. 62 W.
7BS	NW1/4NW1/4NW1/4 sec. 29, T. 40 N., R. 62 W.
7BSL	Quartzite, medium-gray, massive; 72 ft above base of Eureka Quartzite
7BSU	Quartzite like 7BSL; 374 ft above base of Eureka Quartzite
7BCL	Limestone, medium- to dark-gray, medium-bedded; 947 ft above base of Hansen Creek Formation in lower part of Roberts Mountain Formation, 800 ft east of 7,486 ft hill in SW1/4SE1/4NE1/4 sec. 20, T. 40 N., R. 62 E.
7BCU	Limestone, silty, medium-gray, very thin-bedded; 1,572 ft above base of Hansen Creek Formation in Roberts Mountain Formation, south bank of creek in SE1/4SW1/4NE1/4 sec. 17, T. 40 N., R. 62 E.

7C-D	Northern Snake Mountains, Nevada; Gardner (1968) gives the following section: 436 ft Roberts Mountains Formation/1,075 ft Hanson Creek Formation/1,212 ft Eureka Quartzite (170 ft upper quartzite/539 ft middle carbonate/503 ft lower quartzite)/Pogonip Formation

7CSL	Sandstone, quartzitic, light-gray, massive, calcareous; from south side of knob in center NW1/4NE1/4 sec. 10, T. 41 N., R. 61 E., Black Butte NE 7 1/2' Quad.; 100 ft above base of the upper Eureka Quartzite
7CSU	Sandstone like 7CSL; 159 ft above base of upper Eureka Quartzite on north side of knob
7CCL	Limestone, medium- to fine-grained, dark-gray, thin-bedded; 435 ft above base of Hanson Creek Formation in SW1/4SW1/4SE1/4 sec. 3, T. 41 N., R. 61 E.
7CCU	Limestone like 7CCL; 1,025 ft above base of Hanson Creek Formation in SW1/4NE1/4SE1/4 sec. 3

7DSL	Quartzite, white, massive; 69 ft above base of Eureka Quartzite in prominent ridge south of Stormy Creek in NE1/4SW1/4NW1/4 sec. 28, T. 42 N., R. 61 E., Black Butte NE 7 1/2' Quad.
7DSU	Quartzite like 7DSL; boulder in float from upper Eureka Quartzite in NW1/4SE1/4SW1/4 sec. 28, west of road and just inside Black Butte NE 7 1/2' Quad.
7DCL	Limestone, medium-gray, medium-bedded; 683 ft above base of Hanson Creek Formation in NE 1/4 SW 1/4 NW 1/4 sec. 28, T. 42 N., R. 61 E., Stormy Peak 7 1/2' Quad.
7DCU	Limestone, dark-gray, very thin-bedded; 948 ft above base of Hanson Creek Formation in NW1/4SW1/4SW1/4 sec. 21

7E-H	Independence Mountains, Nevada; Tuscarora 15' Quad.; Kerr (1962) gives the following sections: in the lower autochthonous Smith Creek block (localities 7E-F), 1,000 ft Taylor Canyon Formation/108 ft Happy Canyon Formation/724 ft Hanson Creek Formation/1,027 ft Eureka Quartzite with a 90 ft carbonate bed near the middle; in the upper allochthonous Burns Creek overthrust block (localities 7G-H), 535 ft Hanson Creek Formation/557 ft Eureka Quartzite; all in T. 40 N., R. 53 E.

7E	Smith Creek, in east-central part of sec. 31
7ESL	Quartzite, white, massive; 266 ft above base of Eureka Quartzite near middle of lower quartzite
7ESU	Quartzite like 7ESL but slightly calcareous; 817 ft above base of Eureka Quartzite near top of upper quartzite
7ECL	Dolomite, dark-gray; boulder in float 412 ft above base of Hanson Creek Formation
7ECU	Limestone, shaley, black; 1,400 ft above base of Hanson Creek Formation in Taylor Creek Formation

7FSL	Quartzite, light-gray, massive; 4 ft above base of upper Eureka Quartzite in knob near road in east center of NE1/4 sec. 28
7FSU	Sandstone, quartzitic, white, massive; 326 ft above base of upper Eureka Quartzite
7FCL	Dolomite, medium- to dark-gray, thick-bedded; 150 ft above base of Hanson Creek Formation in SE1/4SW1/4 sec. 28
7FCU	Dolomite, dark-gray; 375 ft above base of Hanson Creek Formation in SW1/4SE1/4 sec. 28

7G	All but 7GCU and 7GH samples are in NW1/4SW1/4 sec. 21 near 7,800 ft elevation
7GSL	Sandstone, quartzitic, light-gray, massive; 18 ft above base of lowest Eureka Quartzite seen
7GSU	Quartzite, light-gray, massive; 480 ft above base of Eureka Quartzite
7GCL	Limestone, medium-gray; about 217 ft above base of Hanson Creek Formation
7GCU	Dolomite, light-gray, weathering white; 750 ft above base of Hanson Creek Formation in the Happy Camp Formation on south central edge of SE1/4 sec. 28 (near 7F, but above the thrust fault)
7GHL	Shale, dark-gray, calcareous, interbedded with thin beds of limestone (not included); about 150 ft below top of Taylor Canyon Formation in NE1/4SE1/4 sec. 16
7GHU	Siltstone and minor shale, black, noncalcareous; about 100 ft above 7GHL
7H	Southwest slope of hill in SW1/4 sec. 20
7HSL	Quartzite, white, massive, calcareous; 256 ft above base of Eureka Quartzite
7HSU	Quartzite like 7HSL; 467 ft above base of Eureka Quartzite
7HCL	Limestone, dark-gray with white veining; float 325 ft above base of Hanson Creek Formation
7HCU	Limestone, like 7HCL; 446 ft above base of Hanson Creek Formation

8A-B	Lemhi Range, Idaho; all in T. 9 N., R. 28 E., Diamond Peak 15' Quad.; Ross (1961); Cherkin (1962, figs. 4 and 5)

8A	Badger Creek and Bunting Canyon (Churkin, 1962)
8ASL	Sandstone, quartzitic, white, massive; 118 ft above base of exposed 400 ft Kinnikinic Quartzite in nose between Badger Creek and Bunting Canyon, NW1/4SW1/4 sec. 16
8ASU	Quartzite, white, massive; 361 ft above base of Kinnikinic Quartzite in Bunting Canyon
8ACL	Dolomite, dark-gray, massive; 594 ft above base of 1,041 ft Fish Haven Dolomite, north side of Bunting Canyon on line between secs. 15 and 16
8ACU	Dolomite like 8ACL; 710 ft above base of Fish Haven Dolomite, NW1/4SW1/4 sec. 15, north side of Bunting Canyon
8B	Williams Creek
8BSL	Quartzite, white, massive; 94 ft above base of 500 ft Kinnikinic Quartzite, about 300 ft upstream from mine at end of road, SE1/4NW1/4 sec. 6
8BSU	Quartzite like 8BSL but with some iron staining; 424 ft above base of Kinnikinic Quartzite in NE1/4SW1/4 sec. 6
8BCL	Dolomite, dark-gray; 125 ft above base of 1,000 ft Fish Haven Dolomite in lowest outcrop seen, SE1/4SW1/4 sec. 5
8BCU	Dolomite, fine-grained, light-gray, medium-bedded; 270 ft above base of Fish Haven Dolomite

8C-D	Hawley Mountain, Idaho; T. 9 N., R. 26 E., Hawley Mountain 15' Quad.; Maple and Shropshire (1973), Cherkin (1962, fig. 4)
8C	South side of Hawley Mountain, secs. 22 and 23
8CSL	Quartzite, white and pale pink; 400 ft above base of 1,800 ft Kinnikinic Quartzite, from middle of 3 ribs in the lower Kinnikinic ridge, center sec. 22
8CSU	Quartzite like 8CSL but no pink; 1,483 ft above base in lower part of upper Kinnikinic ridge, NW1/4SE1/4 sec. 22
8CCL	Dolomite, dark-gray, thick-bedded; 712 ft above base of 1,170 ft Saturday Mountain Formation near SW corner of sec. 23
8CCU	Dolomite like 8CCL but massive; 1,070 ft above base of Saturday Mountain Formation
8D	North side of Hawley Mountain
8DSL	Quartzite, white, massive; 1,000 ft above 1800 ft Kinnikinic Quartzite, center SW1/4 sec. 2
8DSU	Quartzite like 8DSL; 1,413 ft above base of Kinnikinic Quartzite, SE1/4SW1/4 sec. 2
8DCL	Dolomite, light-gray, medium-bedded; 1,187 ft above carbonate base and 13 ft above base of 505 ft Laketown Dolomite, NW corner of sec. 12
8DCU	Dolomite, light-gray, medium- to thick-bedded; 1,413 ft above base of carbonates near Middle of Laketown Dolomite, center of north edge NW1/4 sec. 2
8E-F	Germer Basin, Idaho; T. 12 N., R. 19 E.; Ross (1934, 1937), Cherkin (1962)
8E	Secs. 15 and 16; Lone Pine Peak 7-1/2' Quad.
8ESL	Quartzite, white, massive; 10 ft above base of 200 ft exposed Kinnikinic Quartzite, SW1/4NW1/4SE1/4 sec. 16
8ESU	Quartzite like 8ESL; 61 ft above base of Kinnikinic Quartzite
8ECL	Limestone, light-gray, thin-bedded; 1,110 ft above base of carbonates and 210 ft above base of 1,000 ft Laketown Dolomite, center W1/2SW1/4NW1/4 sec. 15
8ECU	Limestone, medium- and dark-purplish-gray, thin-bedded; 1,650 ft above base of carbonates and 750 ft above base of Laketown Dolomite, NW. corner SW1/4NW1/4NE1/4 sec. 15
8F	Secs. 4 and 9; Bradbury Flat 7-1/2' Quad.
8FSL	Quartzite, white, massive; 35 ft above base of 100 ft exposed Kinnikinic Quartzite, east of Bishop Spring, in center of sec. 4
8FSU	Quartzite like 8FSL; 65 ft above base of Kinnikinic Quartzite
8FCL	Limestone, float 100 ft above base of 900 ft Saturday Mountain Formation, NW1/4NW1/4SE1/4 sec. 4

8FCU	Dolomite, fine-grained, light-gray, thin-bedded; 950 ft above base of carbonates and 50 ft above base of 1,000 ft Laketown Dolomite, west of and 100 ft vertically below 8,250 ft peak, in SW1/4NE1/4NE1/4 sec. 9

8G-H	Type area of Kinnikinik Quartzite and Saturday Mountain Formation; T. 11 N., R. 17 E., Clayton 7 1/2' Quad.; Ross (1937), Cherkin (1962), Hobbs and others (1968)

8G	North side of Salmon River along south edge of sec. 22
8GSL	Quartzite, light-gray, massive; 44 ft above base of 700 ft Kinnikinic Quartzite, SW1/4SE1/4SE1/4 sec. 22, U.S. Highway 93 roadcut
8GSU	Quartzite like 8GSL; 687 ft above base of Kinnikinic Quartzite, SW1/4SW1/4SE1/4 sec. 22
8GCL	Limestone, dark-gray, thin-bedded; 72 ft above base of 1,500 ft Saturday Mountain Formation, NW1/4SW1/4SE1/4 sec. 22
8GHL	Siltstone, argillaceous, dark-gray, thin-bedded, noncalcareous; 221 ft above base of Saturday Mountain Formation in SE1/4SE1/4SW1/4 sec. 22
8GCU	Limestone like 8GCL; 374 ft above base of Saturday Mountain Formation in upper limestone outcrop, SE1/4SE1/4SW1/4 sec. 22
8GHU	Shale, medium-gray; 867 ft above base of Saturday Mountain Formation in upper light-weathering unit, SW1/4SE1/4SW1/4 sec. 22

8H	Squaw Creek
8HSL	Quartzite, light-gray, massive; 248 ft above base of 700 ft Kinnikinic Quartzite in ridge northeast of 7,346 ft knob, near center of east edge of E1/2SW1/4NE1/4 sec. 9
8HSU	Quartzite like 8HSL; 474 ft above base of Kinnikinic Quartzite on northwest face of 7,346 ft knob in SW1/4SW1/4NE1/4 sec. 9
8HCL	Dolomite, calcareous, medium- to dark-gray, medium-bedded; 181 ft above base of the Saturday Mountain Formation, at uppermost switchback on Jeep trail at center of W1/2SW1/4 sec. 4
8HCU	Limestone, dark-gray, thin-bedded; 463 ft above base of Saturday Mountain Formation, along Jeep trail, center of west edge SW1/4 sec. 4
8HHL	Shale, black, noncalcareous, grapolites; 490 ft above base of 1,600 ft Saturday Mountain Formation just northwest of mouth of Bruno Creek, center W1/2SE1/4NE1/4 sec. 8
8HHU	Shale, medium- to dark-gray, noncalcareous, contorted bedding; 1,080 ft above base of Saturday Mountain Formation along ridge NW1/4SW1/4NE1/4 sec. 8 near 6,600 ft contour

9A-D	Bear River Range, NE. Utah; Vandorston (1970), Williams (1948, 1958), Williams and Taylor (1964)

9A	Logan Canyon; Logan 7 1/2' Quad.; all samples but the upper carbonate are from south side of canyon between contours 5,200-5,400 ft in NE1/4SE1/4NE1/4 sec. 36, T. 12 N., R. 1 E.

9AWL	Sandstone, quartzitic, very fine-grained, pale-red with white mottling, thin-bedded with thin shaley partings; 5 ft above base of 35 ft Watson Ranch Quartzite (middle Swan Peak of Vandorston, 1970, locality 5)
9AWU	Quartzite, fine- to medium-grained, mottled red and white, thick-bedded; 22 ft above base of Watson Ranch Quartzite
9ASL	Quartzite, white, thick-bedded; 11 ft above base of 50 ft Eureka Quartzite (upper Swan Peak of Vandorston, 1970)
9ASU	Sandstone, quartzitic, light-tan, thick-bedded; 13 ft above base of Eureka Quartzite
9ACL	Dolomite, dark-gray, medium-bedded; 74 ft above base of 150 ft Fish Haven Dolomite
9ACU	Dolomite, medium-gray, massive; 1,484 ft above base of carbonates in upper part of 1,500 ft Laketown Dolomite on north side of U.S. Highway 87 in SE1/4SW1/4SW1/4 sec. 29, T. 12 N., R. 2 E.
9B	Green Canyon; Smithfield 7 1/2' Quad. (sandstones and shales) and Mt. Elmer 7 1/2' Quad. (carbonates). Sandstones and shales from or near quarry on north side of canyon along south edge SW1/4SW1/4 sec. 17, T. 12 N., R. 2 E.
9BWL	Sandstone, quartzitic, very fine-grained, light-greenish-gray, thin-bedded, slightly calcareous; 38 ft above base of 225 ft Watson Ranch Quartzite (lower and middle Swan Peak of Vandorston, 1970, locality 6)
9BHL	Shale, silty, mostly red, noncalcareous; interbedded with 9BWL
9BWU	Sandstone, very fine-grained, red with some green, medium- to thin-bedded, noncalcareous, fucoidal; 190 ft above base of Watson Ranch Quartzite (middle of Vandorston's, 1970, middle Swan Peak)
9BHU	Shale, green and red, thin-wavy-bedded, noncalcareous; from bed just below 9BWU
9BSL	Sandstone, white with iron staining, thick-bedded; 14 ft above base of 40 ft exposed Eureka Quartzite (125 ft upper Swan Peak of Vandorston, 1970)
9BSU	Sandstone, quartzitic, fine-grained, white, thick-bedded; 17 ft above base of Eureka Quartzite
9BCL	Dolomite, medium-gray, thick-bedded; 587 ft above base of carbonates (150 ft Fish Haven and 1,500 ft Laketown Dolomites) in SW1/4SW1/4SE1/4 sec. 17
9BCU	Dolomite, light-gray; 1,547 ft above base of carbonates, SW1/4SE1/4SE1/4 sec. 17
9C	Smithfield Canyon; all in sec. 1, T. 13 N., R. 3 E. (unsurveyed), Naomi Peak 7 1/2' Quad.; sandstones from just north of Pack Trail at 8,000 ft elevation; carbonates from ridge north across gully from Pack Trail
9CWL	Sandstone, dark-reddish-brown with some green spots, medium-bedded; 42 ft above base of 50 ft exposed Watson Ranch Quartzite (lower Swan Peak of Vandorston, 1970, locality 12)
9CWU	Sandstone like 9CWL; 45 ft above base of Watson Ranch Quartzite
9CSL	Sandstone, mottled white and light-brown, thick-bedded; 25 ft above base of 210 ft Eureka Quartzite (upper Swan Peak of Vandorston)
9CSU	Sandstone, tan, massive; 77 ft above base of Eureka Quartzite

9CCL	Dolomite, medium- to dark-gray, thick-bedded; 518 ft above base of 1,580 ft carbonate section in lower Laketown Dolomite in saddle at 8,240 ft elevation
9CCU	Dolomite, medium- to light-gray, thick-bedded; 1,414 ft above base of carbonate section in upper part of Laketown Dolomite at 8,840 ft elevation

9D	Tony Grove Lake, Naomi Peak 7 1/2' Quad.; in or near secs. 31 and 32, T. 14 N., R. 4 E (unsurveyed); three lower sandstones are from cliffs west of the lake and just south of Pack Trail to Naomi Peak; upper three samples are from along the Trail at elevations indicated
9DWL	Sandstone, quartzitic, brown with white fucoids, medium-bedded; base of 40 ft exposed Watson Ranch Quartzite (middle Swan Peak of Vandorston, 1970, locality 9)
9DWU	Sandstone like 9DWL but white and tan; 33 ft above base of Watson Ranch Quartzite
9DSL	Sandstone, white, medium-bedded; 5 ft above base of 118 ft Eureka Quartzite (upper Swan Peak of Vandorston, 1970)
9DSU	Sandstone like 9DSU but much more friable; 88 ft above base of Eureka Quartzite at 8,280 ft elevation
9DCL	Dolomite, medium-gray, highly pitted; 507 ft above base of 1,580 ft carbonate section in lower part of Laketown Dolomite at 9,000 ft elevation
9DCU	Dolomite, light-gray; from 1,184 ft above carbonate base in upper part of Laketown Dolomite at 9,520 ft elevation

9E-F	Soda Springs Hills, Idaho; Soda Springs 15' Quad.; Armstrong (1969)

9E	Upper Valley, on north side of road in scattered outcrops, SE1/4SW1/4 sec. 32, T. 8 S., R. 41 E.
9ESL	Sandstone, quartzitic, white; 102 ft above base of 220 ft exposed Eureka Quartzite (Swan Peak of Armstrong, 1969)
9ESU	Sandstone, white; 192 ft above base of Eureka Quartzite
9ECL	Dolomite, medium-gray, thick-bedded; 127 ft above base of 1,274 ft Fish Haven Dolomite
9ECU	Dolomite like 9ECL; 735 ft above base of Fish Haven Dolomite

9F	Swenson Valley, hills on south side in sec. 25, T. 8 S., R. 41 N.
9FSL	Sandstone, quartzitic, mottled white and brown, medium-bedded, slightly calcareous; 62 ft above base of 512 ft Eureka Quartzite in NW1/4SW1/4 sec. 25
9FSU	Sandstone like 8FSL but white; 435 ft above base of Eureka Quartzite on knob in NE corner of NW1/4SW1/4 sec. 25
9FCL	Dolomite, light-gray; from knobby outcrops 867 ft above base of 1,247 ft Fish Haven Dolomite in center sec. 25
9FCU	Dolomite like 9FCL but medium-grained; 1,146 ft above base of the Fish Haven Dolomite in NW1/4SE1/4 sec. 25

9G-H	Fish Creek Range, Idaho; Bancroft 15' Quad.; Oriel (1968)
9G	Wide Hollow, ridge on north side in secs. 3, 9, and 10, T. 10 S., R. 39 E.
9GSL	Sandstone, quartzitic, white with iron staining, massive; 3 ft above base of 1,200 ft Eureka Quartzite (Swan Peak of Oriel, 1968; thickness measured is 400-500 ft) in SE1/4NE1/4 sec. 9
9GSU	Sandstone like 9GSL; 37 ft above base of Eureka Quartzite
9GCL	Dolomite, light-gray, thick-bedded; 1,510 ft above base of 2,040 ft carbonates (1,000 ft Fish Haven and 1,040 ft Laketown Dolomites) in SW1/4SE1/4 sec. 3
9GCU	Dolomite like 9GCL; 1,847 ft above base of carbonates in upper Laketown Dolomite in SE1/4SE1/4 sec. 3
9H	Fish Creek, south side of ridge in secs. 29 and 31, T. 9 S., R. 39 E.
9HSL	Quartzite, white, thick-bedded; 64 ft above base of 1,200 ft Eureka Quartzite, NE1/4NE1/4 sec. 31
9HSU	Sandstone, quartzitic, white medium-bedded; 1,048 ft above base of Eureka Quartzite in NE. corner sec. 31
9HCL	Dolomite, light-gray, thick-bedded; 1,691 ft above base of 2,040 ft carbonates in upper Laketown Dolomite, SW1/4SE1/4 sec. 29
9HCU	Dolomite like 9HCL but light- to medium-gray; 1,749 ft above base of carbonates
10A-D	Southern Wind River Mountains, Wyoming; Keefer and van Lieu (1966)
10A-B	Miners Delight 7 1/2' Quad.; Bayley (1965)
10A	SW. corner sec. 9, T. 30 N., R. 99 W., just north of Wyoming Highway 28
10ASL	Sandstone, quartzitic, red, calcareous; from float block arbitrarily labeled "lower"
10ASU	Sandstone, quartzitic, wavy-bedded and banded purple, red, and green, calcareous; from another float block
10ACL	Dolomite, mottled very-light and light-gray, pitted weathering; 24 ft above base of 50 ft Bighorn Dolomite
10ACU	Dolomite, mottled white and light-gray, slightly pitted weathering; 30 ft above base of Bighorn Dolomite
10B	Limestone Mountain, NW 1/4 SW 1/4 NW 1/4 sec. 18, T. 30 N., R. 99 W., southeast of Jeep trail
10BSL	Sandstone, buff, slightly calcareous; float block
10BSU	Sandstone like 10BSL but white
10BCL	Dolomite, mottled, light-gray and tan, pitted; 18 ft above lowest exposed Bighorn Dolomite
10BCU	Dolomite like 10BCL; 10 ft above 10BCL in quarry
10C-D	Fossil Hill 7 1/2' Quad.

10C	The Sinks; sandstones and shale from south side of Sinks Canyon in NW1/4SW1/4NE1/4 sec. 19, T. 32 N., R. 100 E.; dolomites from north side of Sinks Canyon in NW1/4SE1/4SW1/4 sec. 18
10CSL	Conglomerate, mottled red fine-grained sand matrix and white pebbles, calcareous; base of 18 ft Lander Sandstone
10CHL	Shale, silty, reddish-brown with green spots, well-bedded, noncalcareous; from 11 ft above base of Lander Sandstone
10CSU	Sandstone, pale reddish-brown, slightly calcareous; 13 ft above base of Lander Sandstone
10CHU	Shale, green, fair bedding, noncalcareous; from 2 ft bed at top of Lander Sandstone
10CCL	Dolomite, mottled light-gray and tan, massive; 1 ft above base of 160 ft Bighorn Dolomite
10CCU	Dolomite like 10CCL; 20 ft above base of Bighorn Dolomite
10D	Fossil Hill, west side in NE 1/4 NW 1/4 SW 1/4 sec. 25, T. 32 N., R. 101 W.
10DSL	Sandstone, quartzitic, finely mottled red and green, calcareous; 7 ft above base of 15 ft Lander Sandstone
10DSU	Sandstone like 10DSL but slightly conglomeratic; top of Lander Sandstone
10DCL	Dolomite, mottled light- and medium-gray, pitted, numerous corals; 105 ft above base of 160 ft Bighorn Dolomite
10DCU	Dolomite like 10DCL; 134 ft above base of Bighorn Dolomite

10E-F	Southern Absoroka Range, Wyoming; Love (1939)

10E	Black Mountain, sec. 34, T. 7 N., R. 4 W.; Johnson Draw 7-1/2' Quad.
10ESL	Sandstone, white, calcareous; from lower part of fairly continuous line of float blocks; Love (1939) gives a 7 ft thickness for Lander Sandstone; SW1/4SW1/4SE1/4 sec. 34
10ESU	Sandstone, quartzitic, light-gray, calcareous; talus block
10ECL	Dolomite, mottled light-gray and brown, massive, pitted surface; 149 ft above base of 180 ft massive Bighorn Dolomite in SE1/4SW1/4NE1/4 sec. 34
10ECU	Dolomite, white, thin-bedded; 186 ft above base of Bighorn and 6 ft above base of 25 ft Leigh Dolomite
10F	Crow Creek, SW 1/4 SW 1/4 SW 1/4 sec. 31, T. 7 N., R. 4 W., Crow Mountain 7 1/2' Quad.
10FS	Sandstone, yellow, calcareous; pebbles in float just below Bighorn Dolomite; divided arbitrarily into upper and lower samples
10FCL	Dolomite, light-gray with some yellow mottling, pitted surface; 23 ft above lowest exposed Bighorn Dolomite
10FCU	Dolomite, light-gray, scattered outcrops; 77 ft above base of Bighorn Dolomite

10G-H	Northern Wind River Mountains; Hayes Park 7 1/2' Quad.

10G	Dry Ridge, SE. corner sec. 25, T. 4 N., R. 6 W., just north of 9334 BM on the Gannett Peak Road

10GCL	Dolomite, mottled light-gray and tan, massive, pitted surface; 52 ft above base of 100 ft exposed Bighorn Dolomite
10GCU	Dolomite like 10GCL; 80 ft above base of Bighorn Dolomite
10H	Dinwoody Ridge in NW 1/4 NW 1/4 SW 1/4 sec. 12, T. 4 N., R. 6 W. just above southeast corner of Mud Lake; Granger and others (1970)
10HCL	Limestone, light-gray with slight mottling, thick-bedded; 20 ft above base of 200 ft Bighorn Dolomite
10HCU	Limestone like 10HCL; 122 ft above base of Bighorn Dolomite

11A-D	All in Deep Lake 15' Quad., Wyoming; Pierce (1965)

11A	Dead Indian Hill, south; NE1/4SW1/4 sec. 9, T. 55 N., R. 104 W.
11ACL	Dolomite, mottled light-gray and yellowish-gray, massive, pitted weathering; 106 ft above base of 400 ft Bighorn Dolomite near middle of lower massive part
11ACU	Dolomite, white, thin-bedded, smooth-weathering; 208 ft above base of Bighorn Dolomite in lower part of Leigh Dolomite Member
11B	Dead Indian Hill, north; NW1/4SE1/4 sec. 4, T. 55 N., R. 104 W.
11BCL	Dolomite, fine- to medium-grained, mottled light-gray and tan, massive, knobby weathering; 32 ft above base of 400 ft Bighorn Dolomite
11BCU	Dolomite, tan, medium-bedded, not notably mottled or pitted; 38 ft above base of Bighorn Dolomite
11C	Clarks Fork, on north side of river in SW1/4SE1/4 sec. 6, T. 56 N., R. 103 W.; Richards and Nieschmidt (1957)
11CCL	Dolomite, mottled tan and gray, massive, knobby weathering; 72 ft above base of 413 ft Bighorn Dolomite
11CCU	Dolomite like 11CCL; 85 ft above base of Bighorn Dolomite
11D	Tolman Ranch; NW1/4SW1/4 sec. 15, T. 57 N., R. 103 W.
11DCL	Dolomite, mottled light-gray and yellowish-gray, massive, friable inside with hard pitted crust; 8 ft above lowest exposure of 400 ft Bighorn Dolomite
11DCU	Dolomite like 11DCL but mottled white and light-gray; 100 ft above base of Bighorn Dolomite

11E-F	Absoroka Range, Montana; Livingston Peak 7 1/2' Quad.; Richards (1957)

11E	Shell Mountain; SE 1/4 NW 1/4 SE 1/4 sec. 17., T. 3 S., R. 11 E. (unsurveyed), between 8,000 and 8,200 ft contours
11ECL	Dolomite, tan mottled with some light-gray, massive, rough but not pitted weathering; 4 ft above base of 200 ft Bighorn Dolomite
11ECU	Dolomite, tan, thin-bedded; 169 ft above base of Bighorn Dolomite in lower part of Leigh Dolomite Member

11F	Mission Creek; west of Creek, NE 1/4 NW 1/4 NE 1/4 sec. 7, T. 3 S., R. 11 E.
11FCL	Dolomite, medium-brownish-gray, massive, smooth-weathering; 33 ft above base of approximately 160 ft exposed Bighorn Dolomite at 6050 ft elevation
11FCU	Dolomite, mottled medium-gray and tan, massive, pitted surface; 152 ft above base of Bighorn Dolomite at 6,400 ft elevation

11G-H	Livingston, Montana, on opposite sides of the Yellowstone River, about 5 miles south of Livingston; Brisbin 7 1/2' Quad.; Roberts (1964)

11G	Suce Creek, north of its mouth, SW 1/4 NW 1/4 SE 1/4 sec. 13, T. 3 S., R. 9 E.
11GCL	Dolomite, mottled light-gray and tan, massive, pitted; 40 ft above base of 120 ft Bighorn Dolomite
11GCU	Dolomite like 11GCL; 67 ft above base of Bighorn Dolomite near top of 15 ft poorly exposed interval in middle of Bighorn Dolomite
11H	Canyon Mountain; SW 1/4 NW 1/4 NE 1/4 sec. 11, T. 3 S., R. 9 E.
11HCL	Dolomite, mottled light-gray and tan, massive, slightly pitted; 31 ft above base of 70 ft Bighorn Dolomite
11HCU	Dolomite like 11HCL; 46 ft above base of Bighorn Dolomite

12A-D	Little Rocky Mountains; Knechtel's (1959) geologic map (1:48,000) is the best available location map

12A	Crown Butte, west side about 1 mi south of Landusky, SE1/4SE1/4 sec. 27, T. 25 N., R. 24 E.
12ACL	Dolomite, calcareous, mottled medium- and dark-gray, some white crystalline calcite, massive knobby weathering; 29 ft above base of 275 ft Bighorn Dolomite
12ACU	Dolomite, very calcareous, light- to medium-gray, medium-bedded, smooth, white weathering; 205 ft above the base of Bighorn Dolomite near middle of Leigh Dolomite Member
12B	Cyprian Butte, north side, NW1/4SW1/4 sec. 4, T. 24 N., R. 24 E.
12BCL	Dolomite, mottled medium- and dark-gray, massive, fair pitting; 42 ft above base of 275 ft Bighorn Dolomite
12BCU	Limestone, light- to medium-gray, smooth-weathering, massive; 229 ft above base of Bighorn Dolomite and 80 ft above base of 125 ft Leigh "Dolomite" Member
12C	Little Chief Creek, SE 1/4 SW 1/4 sec. 30, T. 26 N., R. 25 E.
12CCL	Dolomite, tan, thin- but poorly-bedded, weathers white; 184 ft above base of 275 ft Bighorn Dolomite near middle of 150 ft Leigh Dolomite Member
12CCU	Dolomite like 12CCL and 4 ft above it

12D	Browns Gulch, SW 1/4 SE 1/4 sec. 11, T. 26 N., R. 24 E.
12DCL	Dolomite, very light-gray, weathers white, thin, wavy, poor, bedding that crumbles to small pieces; 192 ft above the base of 275 ft Bighorn Dolomite in the lower poorly exposed part of 150 ft Leigh Dolomite Member
12DCU	Dolomite, light-gray, thick-bedded; 246 ft above base of Bighorn Dolomite in the well-exposed upper part of the Leigh Dolomite Member

13A-D	Black Hills, South Dakota; Darton and Paige (1925)

13A	Deadwood; shales are exposed in north edge of town in roadcut on north side of U.S. Highway 85-14 about 500 ft west of junction with U.S. Highway 14 ALT., NW 1/4 NE 1/4 NE 1/4 sec. 23; sandstones and dolomites are from outcrop north of U.S. Highway 14 ALT. bridge in center W 1/2 SE 1/4 SW 1/4 sec. 13, T. 5 N., R. 3 E.; Deadwood North 7 1/2' Quad.
13AHL	Shale, slightly silty, green; 1 ft above base of 33 ft Icebox Shale
13AHU	Shale, green; 15 ft above base of Icebox Shale
13ASL	Siltstone, very light-gray with some iron staining, thick but poorly bedded, calcareous; 9 ft above base of 20 ft Roughlock Siltstone
13ASU	Siltstone, yellow and light-gray, thick-bedded with fucoids on bedding; 19 ft above base of Roughlock Siltstone
13ACL	Dolomite, mottled buff and light-brown, massive, rough surface; 11 ft above base of 38 ft Whitewood Dolomite
13ACU	Dolomite like 13ACL; 21 ft above base of Whitewood Dolomite
13B	Whitewood Creek; sandstones from east of creek in SW1/4NE1/4NE1/4 sec. 12, and dolomites from west side of creek in NE1/4NW1/4NE1/4 sec. 12, T. 5 N., R. 3 E.; Deadwood North 7 1/2' Quad.
13BSL	Siltstone, white with red and buff veining and some green mottling, thick- but poorly-bedded; 7 ft above base of 15 ft exposed Roughlock Siltstone
13BSU	Siltstone, buff with brown bands parallel to medium-bedding, fucoidal; 15 ft above base of Roughlock Siltstone
13BCL	Dolomite, very calcareous, fine-grained, mostly tan with pink mottling, massive, pitted weathering; 9 ft above base of 60 ft Whitewood Dolomite
13BCU	Dolomite like 13BCL; 53 ft above base of Whitewood Dolomite

13C-D	Shapiro and Gries (1970)

13C	Savoy-Maurice; shales and dolomites from north side of Little Spearfish Creek, 1/4 to 3/4 mi west of Savoy in sec. 36, T. 5 N., R. 1 E., Savoy 7 1/2' Quad.; sandstones are from about 3 mi to the north in the Maurice 7 1/2' Quad.
13CHL	Shale, green, poorly bedded; 9 ft above base of 10 ft exposed Icebox Shale just north of pond, SW1/4NE1/4SE1/4 sec. 36
13CHU	Shale like 13CHL but calcareous; 10 ft above base of Icebox Shale

13CSL	Siltstone, argillaceous, pale-green with some iron staining, thick-bedded; 4 ft above base of 28 ft Roughlock Siltstone, in roadcut north of U.S. Highway 14 ALT, SE1/4SE1/4SE1/4 sec. 18
13CSU	Siltstone, light-gray and buff, thick-bedded; 18 ft above base of Roughlock Siltstone
13CCL	Dolomite, calcareous, banded light-brown and red with liesegang rings, thick-bedded; 2 ft above base of 50 ft Whitewood Dolomite; along road to Roughlock Falls, NE1/4NE1/4SW1/4 sec. 36
13CCU	Dolomite like 13CCL but less banded; 5 ft above base of Whitewood Dolomite
13D	Iron Creek; north of junction of Iron Creek and Spearfish Creek; sandstones and shales in SW1/4SE1/4SE1/4 sec. 19, and dolomites 1/4 mi west in SW1/4SW1/4SE1/4 sec. 19, T. 5 N., R. 1 E.; Savoy 7 1/2' Quad.
13DHL	Shale, slightly silty, green; 6 ft above base of 38 ft Icebox Shale
13DHU	Shale like 13DHL; 14 ft above base of Icebox Shale
13DSL	Siltstone, argillaceous, greenish-gray with brown mottling, poorly bedded; 11 ft above base of 42 ft Roughlock Siltstone
13DSU	Siltstone, mostly buff but some green, slightly calcareous; 20 ft above base of Roughlock Siltstone
13DCL	Dolomite, light-buff; 3 ft above base of 50 ft Whitewood Dolomite
13DCU	Dolomite, calcareous, fine- to medium-grained, mottled brown, gray, and pink, massive, rough weathered surface; 40 ft above base of Whitewood Dolomite

13E	Sheep Mountain, 6 mi north of Sundance, Wyoming; Sundance 15' Quad.; Darton (1905), McCoy (1952); shale is just above vertical cliff and dolomite is above 50 ft covered interval in NW1/4NW1/4 sec. 13, T. 52 N., R. 62 W., sandstone in NE1/4NE1/4 sec. 14; exact stratigraphic relations not clear

13ESL	Sandstone, medium-grained, mostly white but some red patches, friable, scolithus; 1 ft above base of 5 ft ledge of Aladdin Sandstone of McCoy (McCoy, 1952, p. 28 gives a 15 ft thickness)
13ESU	Sandstone like 13ESL but less friable; 4 ft above base of Aladdin Sandstone of McCoy (1952)
13EHL	Shale, medium-greenish-gray; from freshest shale outcrop seen, 2 ft above base of 10 ft exposed Icebox Shale
13EHU	Shale, dark-greenish-gray, weathered; 10 ft above base of Icebox Shale
13ECL	Dolomite, mottled gray and tan, massive, pitted weathered surface; 9 ft above base of 50 ft exposed Whitewood Dolomite
13ECU	Dolomite, calcareous, mottled medium-gray, tan, and rarely pink, massive, fossiliferous; 44 ft above base of Whitewood Dolomite

14A-D	Canyon City embayment, Colorado; Maher (1950), Sweet (1954)

14A	Harding Quarry; quarries north of the classical Harding Quarry, sandstone and shale in SE1/4SW1/4 sec. 30 and dolomite in NE1/4SW1/4 sec. 30, T. 18 S., R. 70 W.; Royal Gorge 15' Quad.; Sweet (1954),

	fig. 4, loc. 9)
14ASL	Sandstone, very fine-grained, varicolored white, pale-green, and pale-purple, medium-bedded; 2 ft above base of 120 ft exposed Harding Sandstone
14AHL	Shale, reddish-brown and some purple, slightly calcareous; 55 ft above base of Harding Sandstone in lower part of 45 ft shale interval near middle of Harding
14AHU	Shale, silty, brick red; 80 ft above base of Harding Sandstone from first thin shale above thick mid-Harding shale
14ASU	Sandstone, very fine-grained, greenish-white, medium-bedded, slightly calcareous; 110 ft above base of Harding Sandstone
14ACL	Dolomite, light-yellowish-gray with some red mottling, massive; 99 ft above base of 200 ft massive Fremont Dolomite (priest Canyon Member not seen)
14ACU	Dolomite, light-tan, thick-bedded; 170 ft above base of Fremont Dolomite
14B	Priest Canyon, NE1/4SE1/4 sec. 13, T. 18 S., R. 71 W., Royal Gorge 15' Quad. (called Ohio Canyon on quadrangle map); Sweet (1954, p. 295 and fig. 4, loc. 8)
14BHL	Shale, silty, purple and light-green, wavy poor bedding; from base of 2 ft shale bed at base of 144 ft Harding Sandstone
14BSL	Sandstone, fine-grained, white, medium-bedded, calcareous; 47 ft above base of Harding Sandstone
14BSU	Sandstone, fine-grained, white, with green shaley lenses, calcareous; 100 ft above base of Harding Sandstone
14BHU	Shale, slightly silty, red with some green and purple, fair bedding, fish scales and one lingula; 110 ft above base of Harding Sandstone
14BCL	Dolomite, light-gray with abundant iron staining, massive; 93 ft above base of 283 ft Fremont Dolomite
14BCU	Dolomite like 14 BCL but with poor thin-bedding; 184 ft above base of Fremont Dolomite (looks like Priest Canyon Member, but should be upper part of massive Harding according to Sweet's (1954) thicknesses--208 ft massive and 75 ft of thin-bedded Priest Canyon)
14C	Red Canyon, NE1/4SE1/4 sec. 6, T. 17 S., R. 70 W.; Cover Mountain 15' Quad.
14CSL	Sandstone, coarse- rounded-grains in fine matrix, mottled brown, purple, white, and yellow, thick-bedded, calcareous; 2 ft above base of 100 ft partly exposed Harding Sandstone
14CSU	Sandstone, very fine-grained, pale-pink with some brown mottling, thick-bedded, calcareous; 79 ft above base of Harding Sandstone
14CCL	Dolomite, calcite on fractures, mottled light-gray and yellow, massive, rough weathered surface; 35 ft above base of 75 ft Fremont Dolomite
14CCU	Dolomite, calcareous, light-gray but stained red along solution cavities; massive; top of Fremont Dolomite
14D	Helena Canyon, SE1/4 sec. 33, T. 16 S., R. 70 W.; Cooper Mountain 7 1/2' Quad.; sandstones and shales from below Jeep trail NW1/4NE1/4SE1/4 sec. 33, dolomites along Jeep trail NE1/4NW1/4SE1/4 sec. 33; Sweet (1954, fig. 4, loc. 6)

14DSL	Siltstone, mottled red, purple, and white, thick-bedded; 21 ft above base of 110 ft Harding Sandstone and just above massive cliff forming unit
14DHL	Shale, silty, finely mottled purple and green, poorly bedded, some calcareous, some not; 39 ft above base of Harding Sandstone and 2 ft above base of thick mid-Harding shale
14DHU	Shale, reddish brown, well-bedded; 54 ft above base of the Harding Sandstone and 3 ft below top of thick mid-Harding shale
14DSU	Sandstone, very fine-grained, fine mottling of red and white, massive, crossbedded, calcareous; 72 ft above base of Harding Sandstone at top of 20 ft sandstone bed
14DCL	Dolomite, mottled reddish brown and yellow, brecciated, thin-bedded; 11 ft above base of 55 ft Fremont Dolomite
14DCU	Dolomite like 14DCL but more yellow; 44 ft above base of Fremont Dolomite
14E-F	Sangre de Cristo Range, Colorado; Howard 15' Quad.; Litsey (1958)
14E	Hayden Pass, NE1/4SW1/4 sec. 34, T. 47 N., R. 10 E. (unsurveyed)
14ESL	Quartzite, light-gray, massive; 3 ft above base of 111 ft Harding Sandstone
14ESU	Quartzite like 14ESL but medium-gray; 72 ft above base of Harding Sandstone
14ECL	Dolomite, dark-gray, thick-bedded; 35 ft above base of 283 ft Fremont Dolomite
14ECU	Dolomite, light- to medium-gray, medium-bedded; 72 ft above base of Fremont Dolomite
14F	Galena Park; SE1/4SE1/4 sec. 21, T. 47 N., R. 10 E. (unsurveyed); along ridge between Hayden Pass and Galena Peak at about 12,000 ft elevation
14FSL	Quartzite, mostly light-gray with tan and red mottling, thick-bedded; 8 ft above base of 111 ft Harding Sandstone
14FSU	Quartzite, medium-gray with some green, medium-bedded; 85 ft above base of Harding Sandstone
14FCL	Dolomite, dark-gray, thick-bedded 32 ft above base of 273 ft Fremont Dolomite
14FCU	Dolomite like 14FCL; 101 ft above base of Fremont Dolomite
14G-H	Kerber Creek, Colorado; all in T. 46 N., R. 8 E., Graveyard Gulch 7 1/2' Quad.; Sweet (1954, fig. 4, loc. 25)
14G	Kerber Creek; SW1/4NW1/4NE1/4 sec. 25 on north slope of 9,532 ft hill south of Kerber Creek
14GSL	Quartzite, light-gray, thick-bedded; 12 ft above base of 80 ft Harding Sandstone
14GSU	Quartzite like 14GSL but almost white; 19 ft above base of Harding Sandstone
14GCL	Dolomite, medium-gray, massive; 86 ft above base of 350 ft Fremont Dolomite in upper part of massive dolomite

14GCU	Dolomite, medium-gray, thick-bedded; 169 ft above base in lower part of Priest Canyon Member
14H	Cody Gulch; partly exposed section on north side of Gulch in sec. 13; quartzites near center of SW1/4 sec. 13, dolomites SW1/4NE1/4SW1/4 sec. 13
14HSL	Quartzite, very fine-grained, medium-gray, medium-bedded; 11 ft above 80 ft exposed Harding Sandstone
14HSU	Quartzite like 14HSL but reddish- to greenish-gray; 29 ft above base of Harding Sandstone
14HCL	Dolomite, light- to medium-gray, medium-bedded, some chert (excluded); 80 ft above base 170 ft exposed Fremont Dolomite near top of massive part
14HCU	Dolomite, medium-gray, thin-bedded; fine chert; 140 ft above base of Fremont Dolomite in lower part of Priest Canyon Member

20A,C	Teton Mountains, Wyoming, on the west or dip-slope side; Schroeder (1969, 1972), Love (1956); no nearby land survey

20A	Coal Creek; Rendevous Peak 7 1/2' Quad.; about 1 1/2 mi up the trail from Coal Creek Campground in cliffs and steep slopes 1,500 ft due west of "C" of Creek on the quadrangle map, elevation 8,800-9,000 ft
20ACL	Dolomite, light-gray, massive, cliff-forming; 46 ft above base of 415 ft Bighorn Dolomite
20ACU	Dolomite, mottled light- and medium-gray, pitted weathering, thick-bedded; 254 ft above base of Bighorn Dolomite
20C	Darby Creek; Mount Bannon 7 1/2' Quad.; about 1 mi up the South Fork of Darby Creek and 500 ft northwest of the "S" in South on the quadrangle map, 7,960-8,060 ft elevation
20CCL	Dolomite, mottled light- and medium-gray, massive, pitted weathering; 157 ft above base of 450 ft Bighorn Dolomite and 3/4 of the way up in the lower massive cliff
20CCU	Dolomite, very light-gray, thin-bedded; 413 ft above base of Bighorn Dolomite and 13 ft above base of 50 ft Leigh Dolomite Member

21A,C	Franklin Mountains, Texas

21A	Sugarloaf Mountain; El Paso 7 1/2' Quad., latitude 31°49'45", longitude 106°28'00", on the north edge of El Paso and the west edge of Franklin Mountains; trail on east side of mountain; El Paso Geological Society (1969, fig. M)
21ACL	Dolomite, calcareous, medium-gray, massive but brecciated; 73 ft above the base of 400 ft Montoya Dolomite and about 3/4 of the way up in the Upham Dolomite Member
21ACU	Dolomite, medium-grained, medium-gray thick-bedded, brachiopods; 439 ft above base of 450 ft carbonate section and 39 ft above base of 50 ft Fusselman Dolomite

21C	North Franklin Mountains; Canutillo 7 1/2' Quad. (access is from North Franklin 7 1/2' Quad. to the west); latitude 37°57'50", longitude 106°30'5"; Pray (1958)
21CCL	Dolomite, medium-gray, medium-bedded; 386 ft above base of 430 ft Montoya Dolomite and 116 ft above base of Cutter Dolomite Member
21CCU	Dolomite, medium-gray, massive; 748 ft above base of 1,040 ft carbonate section, near middle of 610 ft Fusselman Dolomite

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22A,C	Sacramento Mountains, New Mexico; Pray (1953), Darton (1917)

22A	Deadman Canyon, NE1/4SW1/4 sec. 15, T. 18 S., R. 10 E. (unsurveyed), Escondito 15' Quad.
22ASL	Sandstone, medium-grained, medium-gray, calcareous; from lower half of 1 ft Cable Canyon Sandstone Member of Montoya Dolomite
22ASU	Sandstone like 22ASL but coarse-grained; from upper half of 1 ft Cable Canyon Sandstone
22ACL	Dolomite, fine- to medium-grained, medium- to dark-gray; 161 ft above base of 368 ft Montoya Dolomite, near middle of 130 ft Aleman Cherty Member
22ACU	Dolomite, calcareous, light-gray; 267 ft above base of Montoya Dolomite and about 1/3 of the way up in 150 ft Cutter Dolomite Member
22C	Alamo Canyon; NW1/4SW1/4 sec. 34, T. 16 S., R. 10 E., Almagordo 15' Quad.; West Texas Geol. Soc. (1949, figs. 23, 25 and stop #3 on p. 48)
22CSL	Sandstone, coarse-grained, light-gray, calcareous; base of 4 ft Cable Canyon Sandstone
22CSU	Sandstone like 2BSL; 2 ft above base of Cable Canyon Sandstone
22CCL	Dolomite, dark-gray, massive; 68 ft above base of 368 ft Montoya Dolomite in upper part of 88 ft Upham Dolomite Member
22CCU	Dolomite, fine- to medium-grained, medium-gray; 221 ft above base of Montoya Dolomite and 3 ft above base of Cutter Dolomite Member

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23A,C	Nopah Range, California; Stewart Valley 7 1/2' Quad.; Hazzard (1937)

23A	Nopah, East; NW1/4NW1/4 sec. 18, T. 22 N., R. 9 E.
23ASL	Quartzite, vitreous, white, medium-bedded; 119 ft above base of 265 ft Eureka Quartzite
23ASU	Quartzite like 23ASL; 239 ft above base of Eureka Quartzite
23ACL	Dolomite, dark-gray, thick-bedded, cherty (omitted); 280 ft above base of 800 ft Ely Springs Dolomite
23ACU	Dolomite like 23ACL; 395 ft above base of Ely Springs Dolomite
23C	Nopah, North; SW1/4NW1/4 sec. 7, T. 23 N., R. 8 E.; Hazzard (1937, section F-F)
23CSL	Quartzite, white, iron stained, massive; 34 ft above base of 265 ft Eureka Quartzite
23CSU	Sandstone, mostly white, some red; 113 ft above base of Eureka Quartzite

23CCL	Dolomite, dark-gray with some light wavy markings, massive; 595 ft above base of 800 ft Ely Springs Dolomite
23CCU	Dolomite, medium-gray, thick-bedded; 1,025 ft above base of 1,135 ft carbonate section in unnamed beds of Silurian age

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24A,C	South Egan Range, Nevada; Lund 1x2° Quad.; Kellog (1960)

24A	Cave Valley; SW1/4 sec. 6, T. 8 N., R. 64 E., Shingle Pass SE 7 1/2' Quad.
24ASL	Sandstone, white, medium- but poorly bedded; 259 ft above base of 500 ft Eureka Quartzite, in east center NW1/4SW1/4 sec. 6
24ASU	Sandstone like 24ASL; 433 ft above base of Eureka Quartzite, in west center of NE1/4SW1/4 sec. 6
24ACL	Dolomite, medium-gray, medium-bedded; 581 ft above base of 1,500 ft carbonate section and 81 ft above base of 1,000 ft Laketown Dolomite, in NE1/4SW1/4SW1/4 sec. 6
24ACU	Dolomite, light-gray, medium-bedded; 1,145 ft above carbonate base in lower part of upper light band of Laketown Dolomite, SW1/4SE1/4SW1/4 sec. 6
24C	Sunnyside; NW1/4 sec. 13, T. 7 N., R. 62 E.; Kellog (1960, map), Hintz (1960, p. 61), Webb (1956, p. 48)
24CSL	Sandstone, quartzitic, mottled white, red, and some tan, thin-bedded; 4 ft above base of 500 ft Eureka Quartzite
24CSU	Sandstone, white with some pink mottling and banding; 318 ft above base of Eureka Quartzite
24CCL	Dolomite, medium- to dark-gray, medium-bedded; 435 ft above base of 525 ft Ely Springs Dolomite
24CCU	Dolomite, light-gray, medium-bedded; 1,226 ft above base of carbonate section and 701 ft above base of 1,013 ft Laketown Dolomite

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25A,C	Confusion Range, Utah; Hintz (1973, chart 30)

25A	Ibex; east and west sides of Blind Valley, T. 22 S., R. 14 W., the Barn 15' Quad.; Webb (1956, p. 34); Watson Ranch samples from SW1/4NW1/4 sec. 9, Eureka samples from SE1/4NE1/4 sec. 20, and dolomites from SW1/4NW1/4 sec. 8
25AWL	Sandstone, mottled light-tan and pink, medium-bedded, calcareous; 9 ft above base of 249 ft Watson Ranch Quartzite
25AWU	Sandstone like 25AWL but mottled brown and light-gray; 169 ft above base of Watson Ranch Quartzite
25ASL	Sandstone, white, friable; 422 ft above base of 535 ft Eureka Quartzite
25ASU	Sandstone, quartzitic, mottled light- and medium-gray, thick-bedded, calcareous; 515 ft above base of Eureka Quartzite
25ACL	Dolomite, medium-grained, dark-gray, medium-bedded; 682 ft above base of 1,600 ft carbonate section and 82 ft above base of 1,000 ft Laketown Dolomite
25ACU	Dolomite like 25ACL but medium-gray; 135 ft above base of Laketown Dolomite

25C	Crystal Peak; north of road opposite Crystal Peak; NW1/4NW1/4 sec. 24, except 25CCU in NE1/4SW1/4 sec. 13, T. 23 S., R. 16 W., Crystal Peak 15' Quad.; Webb (1956, p. 36)
25CWL	Sandstone, quartzitic, light-gray, thick-bedded, calcareous; 34 ft above base of 205 ft Watson Ranch Quartzite
25CWU	Sandstone, light-gray with minor red patches, thin-wavy-bedding, fucoids, calcareous; 174 ft above base of Watson Ranch Quartzite
25CSL	Sandstone, white, thick-bedded; 514 ft above base of 563 ft Eureka Quartzite
25CSU	Sandstone like 25CSL but slightly calcareous; 519 ft above base of Eureka Quartzite
25CCL	Dolomite, dark-gray, thick-bedded, cherty; 52 ft above base of 600 ft Ely Springs Dolomite
25CCU	Dolomite, dark-gray, medium-bedded; 1,038 ft above base of 1,600 ft carbonate section, near middle of Laketown Dolomite

26A,C	Owl Creek Mountains, Wyoming; Kirk (1930), Tourtelot and Thomson (1948), Keefer and VanLieu (1966)

26A	West Kirby Creek; NW1/4NE1/4SE1/4 sec. 16, T. 41 N., R. 92 W., Blue Hill 7 1/2' Quad.
26ASL	Sandstone, fine-grained with a few larger grains, white; 1 ft above base of 3 ft Lander(?) Sandstone
26ASU	Sandstone, medium- well-rounded grains in a fine-grained mamtrix, white, very calcareous; 2 1/2 ft above base of Lander(?) Sandstone
26ACL	Dolomite, calcareous, white, pitted surface; 4 ft above base of 100 ft Bighorn Dolomite
26ACU	Dolomite, porous, very light-tan, pitted surface; 86 ft above base of Bighorn Dolomite
26CS	Wind River Canyon; SE1/4SW1/4NW1/4 sec. 9, T. 6 N., R. 6 E., Wedding of the Waters 7 1/2' Quad., on the south side of Windy Point; Maughan (1972)
26CSL	Sandstone, 30 percent medium round quartz grains in a fine-grained matrix, buff, slightly calcareous; from 1/2 ft sandy zone at base of Bighorn Dolomite
26CSU	Sandstone like 26CSL and 25 ft laterally from it
26CC	Boysen Dam; NE1/4NE1/4SE1/4 sec. 17, T. 5 N., R. 6 E., Boysen 7 1/2' Quad.
26CCL	Dolomite, very light-gray, smooth-weathering, massive; 1 ft above base 140 ft Bighorn Dolomite
26CCU	Dolomite, fine- to medium-grained, light-gray, massive but highly fractured; 132 ft above base of Bighorn Dolomite

27A,C	Martin Ridge, Antelope Valley, Nevada; Horse Heaven Mtn. 15' Quad.; Merriam (1963)

27A	Martin Ridge, South; NW1/4SE1/4 sec. 31, T. 15 N., R. 50 E.; along ridge east of VABM 8667

27AWL	Sandstone, mottled light-tan and gray, very calcareous; 3 ft above base of 8 ft exposed lower Copenhagen sandstone
27AWU	Sandstone, quartzitic, mottled light-gray and tan; 7 ft above base of lower Copenhagen sandstone
27ASL	Sandstone, light-tan, slightly calcareous; 15 ft above base of 140 ft Eureka Quartzite
27ASU	Sandstone, quartzitic, light-gray, massive, calcareous; 135 ft above base of Eureka Quartzite
27C	Martin Ridge, North; SW1/4SE1/4 sec. 30, T. 16 N., R. 50 E.
27CWL	Quartzite, light-gray, medium-bedded, very calcareous; 4 ft above base of 10 ft exposed lower Copenhagen sandstone
27CWU	Quartzite like 27CWL; 10 ft above base of lower Copenhagen sandstone
27CSL	Quartzite, white, massive, slightly calcareous; 95 ft above base of 150 ft Eureka Quartzite
27CSU	Quartzite like 27CSL; 98 ft above base of Eureka Quartzite

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28A	Spore Mountain, Utah; sandstones are from center of west line SW1/4 sec. 35, T. 12 S., R. 12 W., Topaz Mtn. 15' Quad., and carbonates from secs. 21 and 28, T. 12 S., R. 12 W., Dugway Range 15' Quad.; Staatz and Carr (1964), Webb (1956)

28AWL	Sandstone, thin-bedded with crossbedding, mottled red, yellow, and tan, calcareous; 18 ft above lowest quartzite seen in the lower, mostly shaley part of 250 ft Watson Ranch Quartzite
28AWU	Sandstone, quartzitic, light-gray and red, medium-bedded, slightly calcareous; 24 ft above base of Watson Ranch Quartzite
28ASL	Quartzite, white with red stains, thick-bedded; 295 ft above base of 590 ft Eureka Quartzite
28ASU	Quartzite like 28ASL but slightly calcareous; 395 ft above base of Eureka Quartzite
28ACL	Dolomite, dark-gray, medium-bedded; 368 ft above base of 1,515 ft carbonate section near middle of Staatz' (1964) Flouride Dolomite, about 500 ft northwest of Thursday Mine, NW1/4NE1/4 sec. 28
28ACU	Dolomite, calcareous, medium- to dark-gray, medium-bedded; 830 ft above carbonate base in Staatz' Harrisite Dolomite, about 700 ft south of Blowout Mine in SW1/4SE1/4 sec. 21

28C	Fish Springs, Utah; secs. 15 and 16, T. 11 S., R. 14 W., Fish Springs SW 7 1/2' Quad.; Hintz (1973, chart 16a), Webb (1956, p. 63); sandstones and lower carbonate sample from NW1/4NW1/4SW1/4 sec. 15, upper carbonate from SW1/4SE1/4NE1/4 sec. 16

28CSL	Quartzite, white, massive; 76 ft above base of 95 ft exposed Eureka Quartzite
28CSU	Quartzite like 28CSL but slightly calcareous on cracks; 94 ft above base of Eureka Quartzite
28CCL	Dolomite, dark-gray, massive; 78 ft above base of 250 ft Ely Springs Dolomite

28CCU	Dolommite, medium-grained, light-gray, poorly bedded; 405 ft above base of 1,250 ft carbonate section in lower Laketown Dolomite

29A,C	Newfoundland Mountains, Utah; Brigham City 1x2° Quad.; Paddock (1956), Hintz (1973, chart 4b)

29A	Newfoundland, South; Watson Ranch samples from SW1/4 sec. 31, T. 4 N., R. 13 W., others from SE1/4 sec. 6, T. 3 N., R. 13 W.
29AWL	Sandstone, quartzitic, light-gray, medium-bedded, calcareous; 453 ft above base of 543 ft Watson Ranch Quartzite (called Swan Peak by Paddock, 1956,--mostly very dolomitic)
29AWU	Sandstone, quartzitic, light- to medium-gray, thick-bedded; top of Watson Ranch
29ASL	Sandstone, quartzitic, thick-bedded, calcareous; 69 ft above base of 218 ft Eureka Quartzite, from 3 ft brown band (most is white)
29ASU	Sandstone, quartzitic, white, medium-bedded, calcareous; 101 ft above base of Eureka Quartzite
29ACL	Dolomite, medium-gray, thick-bedded; 418 ft above base of 1,663 ft carbonate section in lower part of Laketown Dolomite
29ACU	Dolomite, dark-gray, massive but brecciated; 693 ft above base of carbonate section

29C	Newfoundland, North; sec. 18, T. 5 N., R. 13 W.
29CWL	Sandstone, quartzitic, medium-gray, medium-bedded, crossbedded, calcareous; 1 ft above base of lowest quartzite seen in 543 ft, Watson Ranch Quartzite
29CWU	Quartzite, light-gray, thin-bedded, calcareous; 9 ft above base of lowest quartzite
29CSL	Quartzite, white, massive; 201 ft above base of 300 ft Eureka Quartzite
29CSU	Sandstone, quartzitic, white, massive, calcareous; 208 ft above base of Eureka Quartzite
29CCL	Dolomite, medium-gray, medium-bedded; 123 ft above base of 500 ft exposed Laketown Dolomite (Ely Springs Dolomite faulted out)
29CCU	Dolomite, dark-gray, thick-bedded; 492 ft above base of Laketown Dolomite

30A,C	Pryor Mountains, Montana

30A	East Pryor Mountain; NE1/4NW1/4NW1/4 sec. 36, T. 7 S., R. 27 E., East Pryor Mountain 7 1/2' Quad.; Shaw (1954)
30ACL	Dolomite, mottled tan and light-brown, massive, pitted weathering; 110 ft above base of 383 ft Bighorn Dolomite, 8,040 ft elevation
30ACU	Dolomite, calcareous, white, thin- but poorly bedded; 320 ft above base of Bighorn and 95 ft above base of Leigh Dolomite Member

30C	West Pryor Mountain; east edge of mountain in sec. 7, T. 6 S., R. 26 E. Billings 1x2° Quad.; Richards and Nieschmidt (1957)

30CCL	Dolomite, mottled tan and light-gray, highly weathered; 8 ft above base of 400 ft Bighorn Dolomite
30CCU	Dolomite, calcareous, mottled tan and light-gray, massive; 195 ft above base of Bighorn Dolomite

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31A,C	Kaufman Ridge, Colorado

31A	Badger Creek; SE1/4NE1/4NE1/4 sec. 23, T. 15 S., R. 76 W., Cameron Mountain 15' Quad.; Sweet (1954, fig. 4, loc. 24)
31ASL	Quartzite, white with some blue, slabby thin-bedded; 1 ft above base of 49 ft exposed Harding Sandstone
31AHL	Shale, silty, dark-green with white spots, calcareous; 23 ft above base of Harding Sandstone
31AHU	Shale, silty, light-greenish-gray, poorly bedded; 29 ft above base of Harding Sandstone
31ASU	Quartzite, light-gray, thin-bedded, calcareous; 49 ft above base of Harding Sandstone
31ACL	Limestone, fine-grained, dark-gray, thin- to medium-bedded; 4 ft above base of 46 ft exposed Fremont Dolomite
31ACU	Dolomite, calcareous, fine-grained, medium-gray, medium-bedded; 37 ft above base of Fremont Dolomite

31C	Trout Creek; center of W1/2 sec. 3, T. 14 S., R. 77 W., Antero Reservoir 15' Quad.; quartzites and carbonates on west side of U.S. Highway 285, shales in roadcuts on the east side; Hayes (1960, p. 147), Sweet (1954, loc. 23)
31CSL	Quartzite, vitreous, white, thick-bedded; 26 ft above base of 60 ft Harding Sandstone
31CHL	Shale, silty, light-greenish-gray; from lowest of four 1-2 ft shale beds in upper part of Harding Sandstone
31CHU	Shale, silty, dark-reddish-gray; from upper shale bed in Harding Sandstone
31CSU	Quartzite, fine- to medium-grained, light-brown, medium-bedded; 54 ft above base of Harding Sandstone
31CCL	Dolomite, medium-gray, massive, corals; 27 ft above base of 75 ft Fremont Dolomite
31CCU	Dolomite like 31CCL; 31 ft above base of Fremont Dolomite

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32A,C	Gunnison National Forest, Colorado

32A	South Matchless Mountain; about 1-1/2 mi southwest of the mountain; sandstones from NE1/4SW1/4SE1/4 sec. 29, and carbonates from NE corner SE1/4SE1/4 sec. 29, T. 14 S., R. 83 W. (unsurveyed), Matchless Mountain 7 1/2' Quad.; access road east from Doctor Mine; R. B. Taylor (1975), personal communication
32ASL	Sandstone, quartzitic, fine-grained, white with brown patches, slightly calcareous; from lower 1 ft of 2-3 ft Harding Sandstone
32ASU	Siltstone, brown, poorly bedded, very calcareous; float in upper part of Harding Sandstone

32ACL	Dolomite, light-gray with brown staining, medium-bedded; 12 ft above base of 75 ft Fremont Dolomite
32ACU	Dolomite, light- to medium-gray, thick-bedded; 40 ft above base of Fremont Dolomite
32C	Cement Creek; NE1/4SW1/4NE1/4 sec. 23, T. 14 S., R. 85 W., Cement Mountain 7 1/2' Quad.; Eldridge (1894), Sweet (1954)
32CSL	Sandstone, medium-grained, pale-green, medium-bedded; 1 ft above base of 10 ft Harding Sandstone
32CSU	Sandstone like 32CSL, but with some coarser grains, and green mottling more pronounced; 5 ft above base of Harding Sandstone
32CCL	Dolomite, tan, massive, calcareous on cracks; 10 ft above base of 35 ft Fremont Dolomite
32CCU	Dolomite like 32CCL; 28 ft above base of Fremont Dolomite

Appendix 2.--Explanation of chemical and mineralogical data for sandstones (2A), shales (2B), and carbonates (2C) from the Tippecanoe sequence arranged schematically according to samples locations. See pages 2A-1, 2B-1, and 2C-1 for sample numers, and figure 1 and Appendix 1 for more precise locations. Compositional data for SiO_2, Al_2O_3, etc. are on pages 2A-2, 2A-3, etc. Markings repeated on all schematic maps are as follows: region numbers above columns of data; horizontal line between areas within major regions, or areas may be side-by-side with region number centered above them; tic marks on right between numbers separate samples from different localities; letter A to H to right of a tic mark indicate localities where the lithology was absent; other letters to the right indicate--W - pair of Watson Ranch sandstones, R - replicate of sample above, L - less than, N - not detected, G - greater than, B - no data or not looked for. Constituents for which all samples are indeterminate (L, N, B, or zero) are skipped and the page number is omitted so constitutents have the same page number for all lithologies.

Sandstone sample numbers

8

08HSL
08HSU
08GSL
08GSU
08GSUR
08FSL
08FSU
08ESL
08ESU

08DSL
08DSU
08CSL
08CSU
08BSL
08BSU
08ASL
08ASU
08ASUR

1

01HSL
01HSU
01GSL
01GSU
01FSL
01FSU
01ESL
01ESU
01DSL
01DSU
01DSUR
01CSL
01CSU
01BSL
01BSU
01ASL
01ASU
01ASUR

13

13ESL
13ESU
13DSL
13DSU
13DSUR
13CSL
13CSU
13BSL
13BSU
13ASL
13ASU

7

07HSL
07HSU
07GSL
07GSU
07FSL
07FSLR
07FSU
07ESL
07ESLR
07ESU

07DSL
07DSU
07CSL
07CSU
07BSL
07BSU
07ASL
07ASU
07ASUR

29

29CWL W
29CWU
29CSL
29CSU
29AWL W
29AWU
29AWUR
29ASL
29ASLR
29ASU

28

28CSL
28CSLR
28CSU
28AWL
28AWU
28ASL
28ASU

9

09HSL
09HSU
09GSL
09GSU
09FSL
09FSU
09ESL
09ESU
09DWL W
09DWU
09DSL
09DSU
09CWL W
09CWU
09CSL
09CSU
09BWL W
09BWU
09BSL
09BSU
09AWL W
09AWU
09ASL
09ASLR
09ASU

10*

10FSL -GH
10FSU
10ESL
10ESU
10DSL
10DSU
10CSL
10CSU
10BSL
10BSU
10BSUR
10ASL
10ASU

26

26CSL
26CSU
26ASL
26ASU

(*, some may be Sauk sequence)

6

06DWL W
06DWU
06DSL
06DSU
06CWL W
06CWU
06CSL
06CSU
06BSL
06BSU
06ASL
06ASU

06HWL W
06HWU
06HSL
06HSU
06GSL
06GSU
06FSL
06FSU
06ESL
06ESU

27

27CWL W
27CWU
27CSL
27CSU
27AWL W
27AWU
27ASL
27ASU

5

05HWL W
05HWU
05HSL
05HSU
05GSL
05GSU
05FSL
05FSU
05FSUR
05ESL
05ESU
05ESUR

05DSL
05DSU
05CSL
05CSLR
05CSU
05BSL
05BSU
05BSUR
05ASL
05ASU

32

32CSL
32CSU
32ASL
32ASLR
32ASU

31

31CSL
31CSU
31ASL
31ASU

24

24CSL
24CSU
24ASL
24ASLR
24ASU

25

25CWL W
25CWU
25CSL
25CSU
25AWL
25AWLR W
25AWU
25ASL
25ASLR
25ASU
25ASUR

2

02HSL
02HSU G
02FSL
02FSU
02ESL
02ESU

02DSL
02DSU
02CSL
02CSU
02BSL
02BSU
02BSUR
02ASL
02ASU

14

14HSL
14HSU
14GSL
14GSLR
14GSU
14FSL
14FSU
14ESL
14ESU

14DSL
14DSU
14CSL
14CSU
14BSL
14BSU
14ASL
14ASU

3

03HSL
03HSU
03GSL
03GSLR
03GSU
03FSL
03FSU
03ESL
03ESU CD
03BSL
03BSU
03ASL
03ASU
03ASUR

23

23CSL
23CSU
23ASL
23ASLR
23ASU

4

04HSL
04HSU
04GSL
04GSU
04FSL
04FSU
04ESL
04ESU

04DSL
04DSU
04CSL
04CSLR
04CSU
04BSL
04BSU
04ASL
04ASU
04ASUR

22

22CSL
22CSU
22ASL
22ASLR
22ASU

SiO2 %

```
          8
98.6000 97.4000
90.5000 98.0000
99.0000G97.5000
99.0000G99.0000G
98.0000R98.8000
97.5000 98.0000
97.2000 98.9000
96.4000 99.0000G
98.4000 98.1000R
```

```
   1                    13
98.0000              97.0000
99.0000G             97.0000
97.8000              85.9000
96.8000              88.0000
97.5000              87.9000R
96.7000              87.2000
98.3000              80.8000
99.0000G             87.9000
97.6000              93.6000
95.2000              87.2000
95.6000R             88.6000
99.0000G
98.2000
98.1000
99.0000G
94.2000
72.1000
72.7000R
```

```
                     7
                82.4000
                58.7000 95.7500
                98.0000 98.1000
                98.1000 97.1000
                99.0000G92.5000
                98.1000R95.2000
                98.4000 98.7000
                97.7000 99.0000G
                97.6000R97.9000
                94.7000 98.7000R
               6
                53.2000W
                47.8000
        72.6000 98.4000
   27   84.1000W93.1000
73.0000 96.7000 59.5000
69.5000W89.8000 67.9000W
94.1000 99.0000G97.1000
94.0000 97.1000 96.4000
80.9000 96.2000 98.6000
97.3000W97.9000 93.3000
98.3000 99.0000G91.7000
82.6000 99.0000G96.8000
                   24      25
                95.3000 87.0000W
                98.4000 83.5000W
                97.8000 99.0000G
                96.9000R98.4000
                98.6000 91.1000
             4          91.2000RW
        98.5000 96.3000 98.3000
        97.0000 97.2000 99.0000G
        88.4000 98.2000 98.4000R
        96.9000 98.2000R80.5000
        97.9000 98.0000 82.5000R
        97.1000 99.0000G
        94.9000 97.6000
        97.5000 97.8000
                96.7000
                98.8000R
```

```
   3
98.3000
82.5000
94.9000
95.0000R
94.0000
95.6000
97.8000
90.1000
97.5000CP   23
99.0000G98.8000
97.7000 99.0000G
99.0000G98.1000
97.3000 99.0000GR
99.0000G97.1000
        R
```

```
  29                 9
67.5000         99.0000G
85.9000W        97.3000
96.3000         97.4000
96.3000         97.1000
95.9000W        97.9000
98.1000         99.0000G
98.7000R        98.1000
76.8000         96.5000
77.0000R        93.2000W
92.9000         95.8000W
  28            98.2000
98.7000         99.0000G
98.6000R        88.1000W
98.3000         87.6000W
83.1000W        91.8000
98.1000         94.7000
96.8000         80.4000W
96.2000         87.3000W
          5     94.5000
91.2000W97.7000 97.7000
76.5000 96.5000 86.9000W
99.0000G98.6000 80.8000
94.9000 96.9000R89.3000
99.0000G99.0000G89.1000R
98.0000 98.3000 90.1000
98.2000 98.9000
98.1000 98.6000R
99.0000R98.2000
98.3000 98.1000
98.5000
99.0000R
```

```
   10
62.6000GH
58.9000    26
87.4000 32.5000
95.7000 31.2000
12.7000 94.6000
 7.0300 34.6000
 5.0000
 8.0100
78.9000
71.2000
71.6000R
 7.4200
34.1000
```

```
                       32      31
                    98.1000 97.7000
                    95.6000 89.3000
                    92.1000 92.1000
                    95.5000R90.2000
                     0.1000
        2                                  14
         74.4000            92.7000
         79.2000            96.2000 86.4000
91.4000  61.1000            95.1000 81.4000
95.0000G 72.4000            94.8000R93.6000
60.2000  66.7000            97.1000 97.5000
73.6000  52.5000            92.0000 93.3000
26.0000  51.9000R           87.9000 80.2000
51.8000  97.7000            91.2000 90.8000
         93.1000            95.0000 90.1000
                                       22
                                    67.9000
                                    52.6000
                                    48.8000
                                    48.3000R
                                    37.9000
```

Al2O3 %

3
0.0300
0.2000
0.6200
0.6300R
0.0700
0.3000
0.1000
0.1500
0.2000
0.2000cp
0.0700
0.1000
0.2000
0.2000R

23
0.2000
0.9100
0.0700
0.1500R
0.1000

27
0.3000
0.2000W
0.0500
0.1000
0.5000
0.7400W
0.0500
0.1000

0.7000
0.3000W
0.8200
0.1000
0.2000
0.2000
0.1500
0.1000
0.1500
0.2000

6
0.6300
0.2000W
0.2000
0.0500
0.3000
0.5300W
0.7900
0.1000
0.2000
0.1000
0.1000
0.1000

7
0.2000
0.7200
0.2000
0.1000
0.1000
0.1000R
0.3000
0.2000
0.2000R
0.2000
0.1000
0.3000
0.1000
0.1500
2.0000
0.1500
0.3000
0.1000
0.2000R

24
0.3000
0.3000
0.1000
0.1500R
0.3000

4
0.2000
0.1000
0.1000
0.1500
0.2000
0.1000
0.3000
0.5000
0.1500
0.5600
0.1000
0.0700R
0.0500
0.2000
0.5000
0.1000
0.2000
0.2000R

25
0.1500
0.8000W
0.1500
0.2000
0.1000
0.1500RW
0.6900
0.1000
0.2000R
0.2000
0.2000R

8
0.3000
5.5200
0.1000
0.2000
0.1000R
0.3000
0.2000
0.1000
0.2000
0.2000
0.3000
0.4000
0.1500
0.3000
0.2000
0.3000
0.2000
0.2000R

29
1.2000
0.2000W
0.9400
0.2000
0.2000
0.1500W
0.2000R
0.6600
0.7200R
0.2000

28
0.5100
0.5700R
0.5000
0.5200
0.2000W
0.4000
0.3000

5
0.4000
0.2000W
0.2000
0.7000
0.4000
0.2000
0.5900
0.3000
0.4000R
0.4000
0.3000
0.3000R
0.4000
0.3000
0.4000
0.4000R
0.5000
0.2000
0.3000
0.5000R
0.1000
0.1500

9
0.1000
0.2000
0.8700
0.6800
0.3000
0.4000
0.2000
0.4000
2.6000
0.6800W
0.2000
0.1000
2.6000
2.5000W
2.8000
1.6000
6.5600
5.0000W
1.7000
0.4000
4.4000
1.1000W
4.6000
4.7000R
4.6000

10
0.4000GH
0.6500
0.8600
0.5700
0.9700
0.8900
0.7400
0.8700
0.6000
0.6100
0.5900R
0.6000
2.1000

26
2.0000
1.3000
1.7000
0.5100

1
0.1000
0.2000
0.4000
0.1000
1.1000
0.7100
0.1000
0.1000
0.9100
1.2000
1.1000R
0.4000
0.3000
0.4000
0.3000
0.8400
0.4000
0.3000R

2
0.1000
0.2000
0.3000G
0.3000
0.2000
0.2000
0.3000
0.3000
0.4000
0.3000
0.4000
0.3000
0.3000R
1.5000
1.9000

32
0.8500
1.3000
1.1000
1.1000R
0.1000

31
0.4000
1.8000
2.2000
0.6500

14
2.2000
1.4000
1.6000
1.6000R
1.1000
3.7000
2.1000
4.0000
2.2000
6.2500
1.3000
0.3000
1.2000
1.6000
3.2000
4.5000
3.6000

22
0.6500
0.5000
0.6100
0.6200R
0.6800

13
0.1500
0.4000
6.5300
5.0400
5.0400R
5.7400
2.8000
5.9400
2.9000
5.3900
5.2500

Fe2O3 %

8
0.0400
0.3500
0.0400
0.0300
0.0200R
0.0100
0.0500
0.0300
0.0400

0.0100
0.0400
0.0200
0.0300
0.0600
0.0300
0.0300
0.0300
0.0300R

1
0.0400
0.0300
0.0200
0.0300
0.0400
0.4600
0.0200
0.0100
0.1600
0.4500
0.4100R
0.1500
0.0600
0.1900
0.0300
0.2900
0.5300
0.5000R

13
0.0300
0.2800
0.8200
0.5500
0.5900R
0.5600
0.5200
0.3800
0.6000
0.4100
0.8300

7
0.0400
0.1600
0.0400
0.0300
0.0200
0.0300R
0.0300
0.0400
0.0500R
0.0400

0.2000
0.0300
0.0300
0.0300
0.0400
0.0400
0.0500
0.0300
0.0200R

29
0.7400
0.2500W
0.0300
0.0100
0.0400W
0.0300W
0.0400R
0.1500
0.1400R
0.0400

28
0.0500
0.0500R
0.1800
0.7400
0.3200W
0.0800
0.1100

9
0.0200
0.0300
0.1900
0.9000
0.2400
0.0200
0.0300
0.0300
0.9000
0.1100W
0.0500
0.0300
1.3200
1.5200W
2.3800
0.5400
2.5200
2.1200W
1.5500
0.1000
1.5200W
0.6100
1.0000
1.0700R
1.0200

10
0.4300GH
0.4200
0.0900
0.0500
1.6300
0.9100
1.5900
1.0700
0.7800
0.2500
0.2300R
1.8000
2.5600

26
0.9200
1.4900
0.2600
0.1400

27
0.3400
0.2300W
0.0300
0.0200
0.4300
0.2800W
0.0300
0.0100

0.3300
0.0900W
0.0600
0.0300
0.0200
0.0600
0.0300
0.0600
0.0400
0.0300

6
0.2200
0.0600W
0.0100
0.0100
0.0300
0.3800W
0.3100
0.0500
0.0500
0.0300
0.0500
0.0300

5
0.7800
0.8800W
0.1300
0.1800
0.0300
0.1000
0.0400
0.0500
0.0300R
0.0400
0.0300
0.0300R

0.0400
0.0200
0.0300
0.0300R
0.0300
0.0200
0.0400
0.0400R
0.0300
0.0500

32
0.0400
0.0500
0.0700
0.0700R
0.7900

31
0.0300
1.4000
0.0500
0.1400

24
0.2200
0.0400
0.0100
0.0100R
0.0100

25
0.0700W
0.1800W
0.0070
0.0400
0.0500
0.0600RW
0.0400
0.0100
0.0200R
0.0400
0.0400R

14
0.3800
0.0800
0.2700
0.2000R
0.1100
0.5900
1.2800
0.2600
0.2300

0.9200
0.3600
3.1300
0.0600
0.0600
0.0600
0.5200
0.2000

2
0.0400
0.0300
0.1100G
0.1000
0.7200
0.1900

0.0600
0.0400
0.0600
0.0500
0.0600
0.0800
0.0700R
0.0500
0.0900

3
0.0600
0.0900
0.4500
0.4600R
0.0400
0.1900
0.0300
0.0600
0.0300
0.0300 CD
0.0100
0.0100
0.0300
0.0300R

4
0.0100
0.0300
0.0500
0.0200
0.0300
0.0200
0.0400
0.0200

0.0200
0.0300
0.0200
0.0100R
0.0300
0.0100
0.0200
0.0300
0.0100
0.0200R

23
0.0300
0.0300
0.0100
0.0300R
0.0500

22
0.4600
0.2000
0.6700
0.6200R
0.1200

MgO %

8
0.0200
0.4000
0.0100
0.0200
0.0200R
0.0200
0.0200
0.0400
0.0300
0.0200
0.0200
0.0100
0.0400
0.0200
0.0200
0.0200
0.0200
0.0700R

1
0.0800
0.0300
0.0700
0.1000
0.1000
0.1000
0.0200
0.0200
0.0500
0.0700
0.0700R
0.0300
0.0600
0.0300
0.0200
0.0400
4.8000
4.8000R

13
0.0100
0.0200
0.3000
0.3000
0.3000R
0.2000
0.1000
0.2000
0.0500
0.2000
0.2000

7
4.0000
7.6200
0.0500
0.0100
0.0100
0.0200R
0.1000
0.0100
0.0100R
0.2000
0.0200
0.0400
0.5000
1.4000
0.2000
0.0200
0.0100
0.0100
0.0030R

29
5.5200W
2.2000
0.0500
0.0300
0.2000W
0.0700
0.0600R
4.4000
4.4000R
1.0000

28
0.0500
0.0600R
0.0700
0.4000W
0.0300
0.0500
0.0600

9
0.0200
0.0300
0.1000
0.0800
0.0600
0.0600
0.0500
0.0300
0.3000W
0.0700
0.0900
0.0020
0.3000W
0.2000
0.2000
0.2000
0.9700W
0.3000
0.3000
0.0500
0.3000W
0.2000
0.2000
0.2000R
0.3000

10 GH
6.9800
7.8800
2.0000
0.4000
16.7000
18.2000
18.8000
18.3000
3.8000
5.9200
5.5000R
18.9000
12.4000

26
13.3000
13.7000
0.1000
12.8000

27
4.6000W
4.2000
0.8900
1.1000
0.0400W
0.0600
0.1000
3.1000

6
5.4800W
3.1000
0.2000
0.0300
0.0200
0.0200
0.0200
0.0100
0.0200
0.0400
9.4100W
11.2000
0.0100
1.3000
8.2700W
6.1900
0.0700
0.1000
0.0500
1.4000
1.2000
0.2000

5
0.6200W
4.2000
0.0300
0.1000
0.0200
0.0100
0.1000
0.0400
0.0500R
0.0500
0.0500
0.0500R
0.0400
0.0200
0.0300
0.0200R
0.0100
0.0200
0.0100
0.0300R
0.0100
0.0100

32
0.1000
0.2000
0.2000
0.2000R
19.9000

31
0.0400
0.2000
0.1000
1.1000

24
0.2000
0.0300
0.0100
0.0100R
0.0100

25
2.4000W
2.9000
0.0300
0.0300
1.1000
1.0000RW
0.0100
0.0200
0.0200R
3.6000
3.4000R

2
1.5000
0.6400
8.1300
4.9000
14.9000
10.0000
5.2500
4.6000
7.5800
2.9000
6.1300
9.5700
9.7600R
0.2000
0.2000

14
0.1000
0.0400
0.0600
0.1000R
0.0500
0.3000
0.2000
0.3000
0.2000
0.4000
3.5000
0.0700
0.0200
0.1000
0.3000
0.3000
0.5100

3
0.3000
4.5000
0.8100
0.7700R
1.5000
0.0600
0.0100
2.9000
0.0500
0.0200 CD
0.0200
0.0300
0.0400
0.0300R

23
0.0300
0.2000
0.0070
0.0100R
0.0200

4
0.0200
0.0100
2.2000
0.0100
0.0300
0.0100
0.5000
0.0400
0.0200
0.1000
0.0200
0.0200R
0.0100
0.0200
0.3000
0.0200
0.0700
0.0700R

22
5.6900
8.9600
10.1000
10.1000R
12.5000

P. 2A-5

CaO %

8

0.0150	0.5700
0.0150	0.0150
0.0070	0.0200
0.0150	0.0300
0.0050R	0.0150
0.0400	0.0100
0.1600	0.0100
0.1400	0.0150
0.1200	0.0100R

1

0.1200
0.0200
0.3300
0.5400
0.1200
0.2100
0.0150
0.0200
0.0800
0.1900
0.1900R
0.0300
0.2100
0.0150
0.0100
1.2700
8.9100
8.8900R

13

0.0100
0.0800
0.1800
0.6100
0.5800R
0.0500
6.9100
0.0400
0.1700
0.6100
0.0500

7

5.8400	
13.5000	0.0600
0.4000	0.0300
0.0100	0.6100
0.0100	2.3400
0.0300R	0.0150
0.2100	0.0150
0.0150	0.0200
0.0200R	0.0030
0.6700	0.0100R

6

		14.1000w
		16.2000
	8.2200	0.0100
27	4.9700w	2.0000
9.3100w	0.0500	12.5000w
12.0000w	4.2900	9.7500
1.3400	0.0100	0.0150
1.6700	0.0100	0.1500
10.6000w	0.0200	0.2000
0.3300	0.0400	2.7700
0.2000	0.0200	2.4500
5.8900	0.0300	0.2500

	24	25
	0.2100	4.1100w
	0.0400	4.6700
	0.0200	0.0200
	0.0150R	0.0200
	0.0500	2.3900
	4	2.2100RW
0.0900	0.0700	0.0400 /
0.0300	0.2400	0.0600
3.2300	0.0300	0.0900R
0.0600	0.0300R	5.4900
0.0700	0.0900	5.1100R
0.0500	0.0300	
1.7000	0.4500	
0.0500	0.0150	
	0.4200	
	0.4400R	

3	
0.0700	
7.7500	
1.2800	
1.2500R	
1.5100	
0.9800	
0.1000	
3.7000	
0.2100	23
0.1700 CD	0.0600
0.2800	0.1400
0.0800	0.0200
0.1200	0.0100R
0.1300R	0.0400

29

10.1000w
5.7200
0.0400
0.2100
0.7500w
0.1500
0.1300R
6.6600
6.5900R
1.5800

28

0.0700
0.0700R
0.5100
7.5100w
0.1900
0.1200
0.3200

5

2.8900w	0.0600
8.3900	0.0700
0.0900	0.0200
0.0800	0.0150R
0.0150	0.0400
0.0200	0.0200
0.0150	0.0300
0.1600	0.0200R
0.1600R	0.0500
0.0200	0.0100
0.0150	
0.0150R	

9

0.0150
0.0200
0.3700
0.1400
0.2000
0.0500
0.0100
0.0400
0.1300w
0.0070
0.0200
0.0070
3.0700w
3.3300
0.0800
0.0150
1.9900w
0.4800
0.0400
0.0400
0.7400w
8.9500
0.2500
0.2600R
0.5400

10 Gtt	
12.2000	26
12.9000	
3.2600	19.7000
0.7200	20.1000
27.6000	0.2600
29.4000	21.0000
29.7000	
28.4000	
5.6600	
8.6900	
8.1600R	
28.1000	
18.8000	

32	31
0.2000	0.3700
0.3800	2.9900
1.5700	0.1900
1.4900R	2.7200
32.0000	

2

	8.0400
	7.1700
2.7000	12.3000
1.5700 G	12.0000
12.1000	10.9000
7.6700	15.1000
23.2000	15.5000R
14.9000	0.1200
	0.9900

14

0.8500	
0.0300	0.1000
0.4000	4.9900
0.4000R	0.7700
0.0700	0.0500
0.0100	1.7800
2.7700	7.5500
0.0700	0.1400
0.2000	1.0300

22

10.2000
15.3000
16.3000
16.3000R
19.2000

Na2O %

```
                                 0.0100L    7
                                 0.0100L    0.0100
                                 0.0100     0.0100L
                                 0.0100L    0.0100L
                                 0.0100L    0.0100L
                                 0.0100LR   0.0100L
                                 0.0100L    0.0100L
                                 0.0100L    0.0100L
                                 0.0100LR   0.0100L
                                 0.0100L    0.0100LR

                      6          0.0200
                                 0.0100 W
                      0.0100     0.0100L
27                    0.0100L W  0.0100L
0.0100L               0.0100L    0.0100
0.0100L W             0.0100L    0.0100 W
0.0100L               0.0100L    0.0200
0.0100L               0.0100L    0.0100L
0.0100L               0.0100L    0.0100L
0.0100L W             0.0100L    0.0100L
0.0100L               0.0100L    0.0100L
0.0100L               0.0100L    0.0100L
                                 24         25
                                 0.0100     0.0100
                                 0.0100L    0.0100 W
                                 0.0100L    0.0100L
3                                0.0100LR   0.0100L
0.0200                           0.0100     0.0100L
0.0200                4                     0.0100LRW
0.0900                0.0100L    0.0100     0.0100
0.1500R               0.0100L    0.0100L    0.0100L
0.0100                0.0100L    0.0100L    0.0100LR
0.0200                0.0100L    0.0100LR   0.0100L
0.0200                0.0100L    0.0100L    0.0100LR
0.0200                0.0100L    0.0100L
0.0100     23         0.0100L    0.0100L
0.0100L Ca 0.0100L               0.0100L
0.0100L    0.0100L               0.0100L
0.0100L    0.0100L               0.0100LR
0.0100L    0.0100LR
0.0100LR   0.0100L
```

```
         8
0.0100     0.0100L
0.0200     0.0100L
0.0100L    0.0100
0.0100L    0.0100L
0.0100LR   0.0100L
0.0400     0.0100L
0.0100L    0.0100L
0.0100L    0.0100L
0.0100L    0.0100LR

29                    9
0.0200                0.0100L
0.0100L W             0.0100L
0.0200                0.0100L
0.0100L               0.0100L
0.0100L               0.0100L
0.0100L W             0.0100L
0.0100LR              0.0100L
0.0100                0.0100L
0.0100R               0.0300
0.0100L               0.0100L W
28                    0.0100L
0.0100L               0.0100L
0.0100LR              0.0500
0.0100L               0.0700 W
0.0200                0.0200
0.0100L W             0.0200
0.0100L               0.0700
0.0100L               0.0500 W
           5          0.0100L
0.0100L    0.0100L    0.0100L
0.0100L W  0.0100L    0.0500 W
0.0100L    0.0100L    0.1400
0.0100L    0.0100LR   0.0700
0.0100L    0.0100L    0.0600 R
0.0100L    0.0100L    0.0500
0.0100L    0.0100L
0.0100L    0.0100LR
0.0100LR   0.0100L
0.0100L    0.0100L
0.0100L
0.0100LR
```

```
                                 1                                13
                                 0.0100L                          0.0100L
                                 0.0100L                          0.0100L
                                 0.0100L                          0.0900
                                 0.0100L                          0.0600
                                 0.0100L                          0.0700 R
                                 0.0100L                          0.0700
                                 0.0100L                          0.0500
                                 0.0100L                          0.1400
                                 0.0100                           0.0300
                                 0.0100                           0.0900
                                 0.0100R                          0.0700
                                 0.0100L
                                 0.0100L
                                 0.0100L
           10                    0.0100L
           0.0200 Git            0.0100
           0.0200     26         0.0200
           0.0100     0.0500     0.0100 R
           0.0100     0.0500
           0.0300     0.0100
           0.0500     0.0100
           0.0500
           0.0200
           0.0200
           0.0200
           0.0200R
           0.0600
           0.0400

                      32         31
                      0.0100L    0.0100L
                      0.0100L    0.0200
                      0.0100L    0.0600
                      0.0100LR   0.0200
                      0.0200
           2                                14
           0.0100                0.0200
           0.0100L               0.0100     0.1400
0.0100L    0.0100                0.0200     0.0200
0.0100L G  0.0100L               0.0200 R   0.0100L
0.0100     0.0100                0.0200     0.0200
0.0100L    0.0100                0.0200     0.0200
0.0100     0.0100 R              0.0100     0.0200
0.0100     0.0200                0.0300     0.0300
           0.0200                0.0100     0.0200

                                            22
                                            0.0200
                                            0.0100L
                                            0.0200
                                            0.0100 R
                                            0.0200
```

K2O %

8

0.0200	0.0200
→1.7000	0.0400
0.0200	0.0500
0.0200	0.0100
0.0300R	0.0400
0.0100	0.0200
0.0050	0.0700
0.0050	0.0300
0.0050	0.0300R

1

0.0300
0.0100
0.0700
0.0200
0.7400
0.4900
0.0200
0.0100
0.6800
0.7900
0.7000R
0.2300
0.1800
0.2400
0.2100
0.5800
0.1600
0.1500R

13

0.0100
0.0300
4.4000
3.7500
3.7600R
4.1000
2.0400
3.2700
1.7600
3.4200
2.3500

7

0.0200	
0.2000	0.0100
0.0300	0.0700
0.0100	0.0200
0.0100	0.0200
0.0100R	0.7500
0.0200	0.0200
0.0200	0.1000
0.0100R	0.0200
0.0200	0.0300R

29

0.5300W
0.0500
0.5900
0.1000
0.0500W
0.0100
0.0100R
0.3500
0.3500R
0.1000

28

0.1500
0.1600R
0.1000
0.2200W
0.0200
0.1600
0.0700

9

0.0600
0.0200
0.3700
0.3800
0.1000
0.0700
0.0600
0.0400
1.5500W
0.2900
0.0900
0.0050
1.3500W
1.4600
1.7300
0.6800
4.0200W
3.1300
0.5100
0.1200
2.7600W
0.5300
3.5400
3.5300R
3.1600

10

0.1800GH
0.2500
0.5900
0.3700
0.6500
0.5700
0.4100
0.5700
0.3700
0.3600
0.3400R
0.3800
1.5700

26

1.0300
0.6900
1.0900
0.2000

6

	0.2400W
	0.0400
0.3200	0.0050
0.0200W	0.0050
0.2600	0.0400
0.0100	0.1600W
0.0300	0.2200
0.0500	0.0050
0.0100	0.0050
0.0100	0.0050
0.0100	0.0050
0.0200	0.0050

27

0.0500W
0.0400
0.0050
0.0050
0.1000W
0.1600
0.0100
0.0100

5

0.1100W	0.0800
0.0500	0.0400
0.0500	0.0600
0.2400	0.0800R
0.0800	0.0700
0.0200	0.0100
0.2100	0.0700
0.0900	0.0800R
0.0900R	0.0100
0.1400	0.0050
0.0900	
0.1000R	

32

0.3100
0.5000
0.3700
0.3600R
0.0200

31

0.2500
0.9600
0.9600
0.0400

24

0.1200
0.0300
0.0100
0.0100R
0.0100

25

0.0200W
0.5100
0.0200
0.0200
0.0100
0.0200RW
0.3500
0.0200
0.0200R
0.0300
0.0300R

2

	0.1200
	0.1100
0.0050	0.1100
0.0050G	0.0300
0.0050	0.1600
0.0200	0.0900
0.0100	0.0800R
0.0050	0.4700
	0.6000

14

1.0900	
0.7400	3.6000
0.6900	0.4700
0.7000R	0.0800
0.6500	0.7700
2.0700	0.8200
1.0300	1.0000
2.4500	1.5700
1.3400	1.0900

3

0.0050
0.0300
0.0500
0.0400R
0.0100
0.0200
0.0100
0.0050
0.0050CD
0.0100
0.0050
0.0200
0.0400
0.0400R

23

0.0300
0.3000
0.0050
0.0050R
0.0200

4

0.0100	0.0300
0.0100	0.1800
0.0300	0.0050
0.0300	0.0050R
0.0200	0.0100
0.0050	0.0200
0.0800	0.1400
0.1300	0.0200
	0.0600
	0.0500R

22

0.2800
0.2100
0.2900
0.2900R
0.3800

TiO2 %

8
0.0100 0.0100
0.1600 0.0100
0.0100 0.0400
0.0200 0.0050
0.0100R 0.0100
0.0200 0.0200
0.0030 0.0200
0.0070 0.0070
0.0100 0.0200R

1
0.0900
0.0700
0.1300
0.0500
0.0800
0.0700
0.0700
0.1100
0.0700
0.1000
0.1000R
0.0600
0.0600
0.0700
0.0700
0.0800
0.0800
0.0700R

13
0.0200
0.0200
0.3400
0.2500
0.2300R
0.2800
0.1500
0.2800
0.1300
0.2500
0.2700

7
0.0030
0.0300 0.0100
0.0100 0.0200
0.0100 0.0100
0.0100 0.0100
0.0100R 0.1000
0.0070 0.0050
0.0200 0.0200
0.0150R 0.0200
0.0070 0.0070R

29
0.0300W
0.0050
0.0400
0.0100
0.0150W
0.0200
0.0200R
0.0150
0.0100R
0.0100

9
0.0200
0.0070
0.0200
0.0200
0.0100
0.0200
0.0200
0.0200
0.0800W
0.0200
0.0200
0.0070
0.0700W
0.0900W
0.0600
0.0600
0.2200W
0.1300
0.0500
0.0200
0.1300W
0.0200
0.1500
0.1600R
0.1700

10
0.0300GH
0.0100
0.0200
0.0200
0.0300
0.0200
0.0100
0.0200
0.0300
0.0300
0.0300R
0.0070
0.0900

26
0.0800
0.0500
0.0900
0.0100

6
0.0300W
0.0200
0.0050
0.0020
0.0100W
0.0600
0.0400
0.0050
0.0030
0.0030
0.0030
0.0050

0.0300W
0.0050
0.0400
0.0050
0.0100
0.0100
0.0100
0.0100
0.0100
0.0100

27
0.0100W
0.0070
0.0100
0.0070
0.0200W
0.0200
0.0070
0.0050

28
0.0200
0.0200R
0.0200
0.0100W
0.0070
0.0200
0.0200

5
0.0070 0.0200
0.0050W 0.0200
0.0200 0.0200
0.0200 0.0400R
0.0200 0.0300
0.0070 0.0070
0.0200 0.0200
0.0150 0.0200R
0.0200R 0.0030
0.0200 0.0070
0.0200
0.0200R

32
0.0600
0.1000
0.0600
0.0600R
0.0010

31
0.0600
0.1700
0.0700
0.0200

24
0.0100
0.0070
0.0070
0.0070R
0.0500

25
0.0030W
0.0200
0.0070
0.0050
0.0030
0.0030RW
0.0200
0.0100
0.0200R
0.0030
0.0030R

2
0.0200
0.0200
0.0010 0.0600
0.0010G 0.0200
0.0200 0.0300
0.0300 0.0300
0.0200 0.0300R
0.0300 0.0500
0.0800

14
0.1500
0.0800 0.5700
0.1100 0.1400
0.1100R 0.1200
0.0900 0.1100
0.3000 0.1300
0.1900 0.2300
0.3300 0.4000
0.1400 0.4200

3
0.0030
0.0200
0.0200
0.0200R
0.0030
0.0030
0.0030
0.0100
0.0070
0.0070CD
0.0070
0.0100
0.0100
0.0200R

4
0.0050 0.0100
0.0030 0.0200
0.0100 0.0100
0.0100 0.0070R
0.0100 0.0100
0.0050 0.0070
0.0200 0.0200
0.0200 0.0050
0.0100
0.0150R

23
0.0070
0.0200
0.0050
0.0050R
0.0100

22
0.1300
0.0400
0.0800
0.0800R
0.0200

P2O5 %

```
                                                                  8                                                      1                     13
                                                       0.0200     0.0300                                            0.0200                0.0300
                                                       0.0300     0.0300                                            0.0200                0.0700
                                                       0.0100     0.0200                                            0.0200                0.1000
                                                       0.0200     0.0300                                            0.0200                0.0600
                                                       0.0200R    0.0200                                            0.0300                0.0600R
                                                       0.0200     0.0300                                            0.0300                0.0700
                                                       0.0200     0.0200                                            0.0200                0.0900
                                                       0.0200     0.0200                                            0.0200                0.0700
                                                       0.0700     0.0200R                                           0.0300                0.0500
                                                                                                                    0.2000                0.0700
                                                                                                                    0.2000R               0.0900
                                                                                                                    0.0300
                                                                                                                    0.0200
                                                                                                                    0.0300
                                 7                                                     10 GH                        0.0100
                                 0.0600                29                    9          0.1000                      0.1000
                               → 0.4000     0.0400     0.0000NW              0.0200     0.0700     26               0.0500
                                 0.0300     0.0600     0.0100                0.0100     0.0700     0.0000N          0.0800R
                                 0.0200     0.0200     0.0300                0.2000     0.0400     0.0000N
                                 0.0200     0.0100     0.0200                0.0900     0.2000     0.0500
                                 0.0200R    0.0200     0.0300W               0.0700     0.1000     0.0200
                                 0.0500     0.0200     0.0200                0.0200     0.0000N
                                 0.0300     0.0400     0.0300R               0.0200     0.2000
                                 0.0200R    0.0100     0.0100                0.0300     0.0700
                                 0.0300     0.0200R    0.0400R               0.0900W    0.0100
                                 6                     0.0200                0.0200     0.0300R
                                 0.0000NW              28                    0.0100     0.0000N
                                 0.0000N               0.0300                0.0200     0.2000
                      0.0700W    0.0200                0.0300R               2.2000W
           27         0.0400     0.0100                0.0200                2.4000
           0.0800     0.0200     0.0100W               0.3000W               0.2000
           0.0100W    0.0100     0.0000N               0.0500W               0.0300
           0.0200     0.0200     0.0300                0.0200                0.3000W
           0.0300     0.0200     0.0700                0.0100                0.3000
           0.0000N    0.0100     0.0300                           5          0.0400                           32         31
           0.0500W    0.0100     0.0400                0.0800     0.0400     0.0300                           0.1000     0.0200
           0.0300     0.0100     0.0200                0.0000NW   0.0200     0.5000W                          0.3000     2.2000 ←
           0.0200     0.0200     0.0200                0.0200     0.0300     5.9300                           0.1000     0.0400
                                 24         25         0.0200     0.0200R    0.2000                           0.2000R    0.0300
                                 0.0400     0.0400W    0.0300     0.0200     0.2000R                          0.0000N
                                 0.0200     0.0400     0.0200     0.0200     0.4000                2                     14
                                 0.0200     0.0200     0.0200     0.0200                           0.0000N               0.6200
3                                0.0200R    0.0200     0.0200     0.0300R                          0.0000N               0.0700     0.0600
0.0200                           0.0300     0.0300     0.0200R    0.0200                0.0900     0.0000N               0.3000     0.0700
0.0300                           4          0.0100RW   0.0200     0.0100                0.0400G    0.0000N               0.3000R    0.0200
0.0400                0.0200     0.0200     0.0200     0.0200                           0.0000N    0.0200                0.0400     0.0600
0.0200R               0.0200     0.0200     0.0200     0.0200R                          0.0000N    0.0100                0.0500     0.0700
0.0200                0.0600     0.0200     0.0200R                                     0.4000     0.0400R               2.8000     0.5100
0.0100                0.0200     0.0300R    0.0100                                      0.0900     0.0500                0.0400     0.0900
0.0100                0.0200     0.0300     0.0100R                                                0.0400                0.2000     0.3000
0.0500                0.0200     0.0200
0.0100     23         0.1000     0.0200                                                                                             22
0.0300     0.0200     0.0200     0.0200                                                                                             0.7900
0.0200     0.0200                0.0500                                                                                             0.6300
0.0300     0.0200                0.0500R                                                                                            0.1000
0.0200     0.0100R                                                                                                                  0.1000R
0.0200R    0.0200                                                                                                                   0.0000N
```

F %

8
0.0400L 0.0400L
0.0600 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400LR 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L 0.0400LR

1
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400LR
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400LR

13
0.0400L
0.0400L
0.0400
0.0400L
0.0400LR
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L

7
0.0400L
0.0500 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400LR 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400LR 0.0400L
0.0400L 0.0400LR

6
0.0400L W
0.0400L
0.0400L
0.0400L
0.0400L W
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L

27
0.0400L W
0.0400L
0.0400L W 0.0400L
0.0400L W 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L W 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L

24 25
0.0400L 0.0400L W
0.0400L 0.0400L
0.0400L 0.0400L
0.0400LR 0.0400L
0.0400L 0.0400L
0.0400LR W

4
0.0400L 0.0400L 0.0400L
0.0400L 0.0400L 0.0400L
0.0400L 0.0400L 0.0400LR
0.0400L 0.0400LR 0.0400L
0.0400L 0.0400L 0.0400LR
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L
0.0400LR

3
0.0400L
0.0400L
0.0400L
0.0400LR
0.0400
0.0400L
0.0400L
0.0400L
0.0400L

23
0.0400L G.H. 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L 0.0400LR
0.0400LR 0.0400L

29
0.0400L W
0.0400L
0.0400L
0.0400L
0.0400L W
0.0400L
0.0400LR
0.0400L
0.0400LR
0.0400L

28
0.0400L
0.0400LR
0.0400L
0.0400 W
0.0400L
0.0400L
0.0400L

5
0.0400L W 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L 0.0400LR
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400L 0.0400LR
0.0400LR 0.0400L
0.0400L 0.0400L
0.0400L
0.0400LR

9
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0500 W
0.0400L
0.0400L
0.0400L
0.2100 W
0.2300
0.0400L
0.0400L
0.0500 W
0.0600
0.0400L
0.0400L
0.0700 W
(0.5400
0.0400L
0.0400LR
0.0600

10
0.0400L G.H.
0.0400L
0.0400L
0.0400L
0.0400
0.0400
0.0400
0.0500
0.0400L
0.0400L
0.0400LR
0.0400L
0.0400L

26
0.0500
0.0400L
0.0400L
0.0400L

32
0.0500
0.0700
0.0500
0.0500 R
0.0400L

31
0.0400L
0.2100
0.0400L
0.0400

2
0.0400L
0.0400L
0.0400L 0.0400L
0.0400L G 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.0400 0.0400LR
0.0400L 0.0400L
0.0400L

14
0.0700
0.0400L 0.0400L
0.0400 0.0400L
0.0400LR 0.0400L
0.0400L 0.0400L
0.0400L 0.0400L
0.2100 0.0400
0.0400L 0.0400L
0.0400L 0.0500

22
0.0600
0.0900
0.0400L
0.0400LR
0.0400L

p. 2A-11

Total S %

8

0.0040
0.0007L
0.0020
0.0050
0.0160R
0.0040
0.0140
0.0060
0.0520

0.0007L
0.0020
0.0060
0.0030
0.0007
0.0020
0.0008
0.0060
0.0060R

1

0.0060
0.0040
0.0020
0.0030
0.0020
0.0010
0.0010
0.0030
0.0020
0.0080
0.0060R
0.0020
0.0020
0.0010
0.0007L
0.0030
0.0130
0.0060R

13

0.0030
0.0030
0.0160
0.0120
0.0110R
0.0140
0.0130
0.0060
0.0040
0.0610
0.0090

7

0.0160
0.0210
0.0040
0.0090
0.0030
0.0040R
0.0170
0.0007L
0.0050R
0.0050

0.0230
0.0030
0.0050
0.0040
0.0050
0.0020
0.0050
0.0007L
0.0010R

29

0.0140
0.0030W
0.0060
0.0080
0.0040
0.0040W
0.0020R
0.0050
0.0060R
0.0050

28

0.0020
0.0030R
0.0070
0.0150
0.0290W
0.0010
0.0040

9

0.0007L
0.0007L
0.0160
0.0060
0.0020
0.0030
0.0010
0.0020
0.0020
0.0030W
0.0010
0.0007
0.0210
0.0250W
0.0650
0.0040
0.0090
0.0030W
0.0060
0.0040
0.0080W
0.0490
0.0050
0.0140R
0.0240

10

0.0160G#
0.0130
0.0090
0.0020
0.0180
0.0210
0.0300
0.0200
0.0060
0.0200
0.0060R
0.0160
0.0210

26

0.1420
0.0530
0.0060
0.0160

6

0.0320
0.0120W
0.0020
0.0020
0.0150
0.0140W
0.0040
0.0100
0.0010
0.0130
0.0060
0.0007L

27

0.0070
0.0090W
0.0070
0.0040
0.0070
0.0090W
0.0030
0.0070

0.0110
0.0050W
0.0020
0.0050
0.0160
0.0060
0.0020
0.0030
0.0010
0.0030

24

0.0400
0.0007L
0.0007L
0.0007R
0.0010

25

0.0070W
0.0040W
0.0010
0.0020
0.0040
0.0050RW
0.0030
0.0020
0.0020R
0.0060
0.0060R

4

0.0010
0.0030
0.0040
0.0030
0.0020
0.0040
0.0030
0.0020

0.0010
0.0040
0.0020
0.0010R
0.0040
0.0007
0.0010
0.0020
0.0030
0.0030R

3

0.0050
0.0050
0.0060
0.0070R
0.0010
0.0010
0.0020
0.0010
0.0040
0.0060 CD
0.0060
0.0040
0.0030
0.0030R

23

0.0020
0.0080
0.0040
0.0030R
0.0010

5

0.0040
0.0030W
0.0007L
0.0010
0.0030
0.0030
0.0020
0.0040
0.0008R
0.0007L
0.0020
0.0020R

0.0010
0.0040
0.0010
0.0010R
0.0007L
0.0007L
0.0030
0.0030R
0.0010
0.0040

32

0.0040
0.0060
0.0008
0.0020R
0.0190

31

0.0007L
0.0120
0.5200 ←
0.0050

2

0.0030
0.0008
0.0250
0.0160
0.0320
0.0410

0.0140
0.0050
0.0090
0.0010
0.0050
0.0130
0.0110R
0.0060
0.0020

14

0.0100
0.0060
0.0100
0.0090R
0.0020
0.0670
0.2050
0.0007L
0.0070

0.0400
0.0050
0.0030
0.0030
0.0050
0.0010
0.0090
0.0210

22

0.0720
0.0220
0.0340
0.0330R
0.0330

Total C %

8

0.0300
0.0600
0.0100L
0.0300
0.0500R
0.0100L
0.0300
0.1300
0.0800

0.1500
0.0100L
0.0800
0.0700
0.0600
0.0100L
0.0100L
0.0300
0.0100LR

1

0.0900
0.0500
0.1200
0.1800
0.0900
0.2100
0.1500
0.1000
0.1500
0.0600
0.0600R
0.0100L
0.1900
0.0100L
0.0800
0.4100
3.2700
3.1400R

13

0.0300
0.0500
0.2000
0.2300
0.1800R
0.0300
2.1600
0.0300
0.1400
0.2500
0.0100L

7

2.4000
5.0000
0.0900
0.0100L
0.0400
0.5800R
0.1500
0.1300
0.2100R
0.3200

0.1500
0.0600
0.2800
0.9600
0.1100
0.0100L
0.1200
0.1400
0.0900R

29

3.7800W
1.9000W
0.0300
0.0600
0.2100W
0.1300W
0.0600R
2.8000
2.5700R
0.6600

28

0.0600
0.0500R
0.1800
1.6500W
0.0900W
0.1200
0.1300

9

0.0500
0.1900
0.0100L
0.0200
0.0800
0.0600
0.0100L
0.0800
0.6100W
0.0600W
0.2400
0.0300
0.0600W
0.2300
0.1100
0.0600
0.4500W
0.0100LW
0.1100
0.0900
0.0500W
0.2400
0.0300
0.1200R
0.0300

10 GH

4.4700
4.8300
1.2100
0.4500
10.3700
10.9300
11.5600
11.3300
2.1400
3.1600
3.4200R
11.4500
6.8600

26

8.2100
7.2600
0.3000
7.3500

6

5.5200W
6.2200W
0.0500
0.8600
4.8000
3.7500W
0.0100L
0.0700
0.0500
0.9600
0.8700
0.0800

27

3.3100
3.6000W
0.5200
0.7400
2.1600W
0.0900W
0.0900
2.1800

3.1700W
1.9800W
0.0900
0.9000
0.0100L
0.0500
0.1100
0.1200
0.0800
0.3300

24

0.2000
0.0300
0.1900
0.1000R
0.0800

25

1.8600W
1.9000W
0.0500
0.0600
0.7400
0.7700RW
0.1100
0.0600
0.0900R
2.1200
2.1000R

4

0.0300
0.0100L
1.4300
0.0500
0.1200
0.0600
0.4600
0.1400

0.0100L
0.1400
0.0500
0.0300R
0.0300
0.0100L
0.1200
0.0100L
0.1500
0.1600R

5

0.8300W
3.3800W
0.1000
0.1200
0.0600
0.1400
0.0600
0.1400
0.0800R
0.1200
0.1400
0.0600R

0.0600
0.0600
0.1200
0.0300R
0.1300
0.0900
0.0100L
0.0300R
0.0100L
0.0500

3

0.0300
1.1000
0.3200
0.2900R
0.2700
0.2300
0.0100L
0.4700
0.0400
0.0300
0.0800
0.0300
0.0600
0.0100LR

23

CO 0.0900
0.1100
0.0300
0.1000R
0.0500

32

0.0100L
0.0100L
0.3400
0.2700R
12.6600

31

0.1700
0.0900
0.0100L
0.6500

2

0.9500
0.5400G
4.8900
3.1600
8.1100
5.7300

3.2900
2.7700
5.1900
3.3700
4.1000
5.9800
5.4400R
0.0300
0.1800

14

0.1200
0.0900
0.0400
0.0700R
0.2000
0.0100L
0.1800
0.4000
0.1100

0.0300
1.9800
0.1900
0.1200
0.4600
1.4900
0.1300
0.3300

22

3.7800
5.0400
6.1300
6.0200R
7.4500

p. 2A-13

Organic C %

8

0.0300 0.0300
0.0300 0.0100L
0.0100L 0.0800
0.0300 0.0500
0.0500R 0.0500
0.0100L 0.0100L
0.0100 0.0100L
0.1300 0.0300
0.0400 0.0100LR

1

0.0800
0.0500
0.0600
0.0600
0.0700
0.1700
0.1500
0.0900
0.1500
0.0100L
0.0100LR
0.0100L
0.1500
0.0100L
0.0800
0.1500
0.0000B
0.0000BR

13

0.0300
0.0500
0.2000
0.0400
0.0900R
0.0100
0.0000B
0.0300
0.1000
0.1300
0.0100L

7

0.0000B
0.0000B 0.1200
0.0100 0.0300
0.0100L 0.0200
0.0400 0.0000B
0.0000BR 0.1100
0.0200 0.0100L
0.1300 0.1200
0.2100R 0.1400
0.0600 0.0900R

29

0.0000B
0.0000B W
0.0300
0.0300
0.1100 W
0.0900 W
0.0400R
0.0000B
0.0000BR
0.0000B

28

0.0600
0.0500R
0.1200
0.0000B
0.0400 W
0.1000
0.0700

9

0.0500
0.1900
0.0100L
0.0200
0.0600
0.0400
0.0100L
0.0800
0.0800
0.0600 W
0.1800
0.0300
0.0600
0.1700 W
0.0500
0.0600
0.0200
0.0100L W
0.1100
0.0800
0.0500 W
0.1200
0.0300
0.1200R
0.0100

10

0.0000B GH
0.0000B
0.1100
0.1900
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B

26

0.0000B
0.0000B
0.2200
0.0000B

6

0.0000B W
0.0000B W
0.0500
0.0800
0.0000B
0.0000B W
0.0100L
0.0700
0.0100
0.0000B
0.1600
0.0200

27

0.0000B
0.0000B W
0.0000B 0.0900
0.0000B W 0.0400
0.0000B 0.0100L
0.0900 0.0500
0.0000B 0.1100
0.0300 W 0.1200
0.0300 0.0500
0.0000B 0.0000B

5

0.0000B 0.0400
0.0000B W 0.0600
0.1000 0.0600
0.1100 0.0100R
0.0600 0.1200
0.1400 0.0800
0.0600 0.0100L
0.1100 0.0300R
0.0700R 0.0100L
0.1200 0.0500
0.1400
0.0500R

32

0.0100L
0.0100L
0.1000
0.0300R
0.0000B

31

0.1100
0.0900
0.0100L
0.0500

24

0.1400
0.0200
0.1300
0.1000R
0.0800

25

0.0000B W
0.0000B
0.0500
0.0600
0.0000B
0.1000RW
0.1100
0.0500
0.0800R
0.0000B
0.0000BR

2

0.0000B
0.0000B
0.0500 0.0000B
0.1000 G 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000BR
0.0000B 0.0300
0.0600

14

0.0900
0.0600 0.0300
0.0400 0.0000B
0.0700R 0.0700
0.1600 0.1100
0.0100L 0.1000
0.1800 0.0000B
0.0000B 0.0700
0.1100 0.0800

3

0.0300
0.0500
0.0200
0.0400R
0.0300
0.0500
0.0100L
0.0000B
0.0100
0.0100L CD

0.0200
0.0300
0.0500
0.0100LR

4

0.0100 0.0100L
0.0100L 0.0800
0.0000B 0.0500
0.0300 0.0300R
0.1200 0.0100
0.0600 0.0100L
0.0000B 0.0600
0.1400 0.0100L
0.0500
0.0600R

23

0.0800
0.0700
0.0300
0.1000R
0.0500

22

0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B

Carbonate C %

8
0.0100L
0.0300
0.0100L
0.0100L
0.0100LR
0.0100L
0.0200
0.0100L
0.0400
0.1200
0.0100L
0.0100L
0.0200
0.0100
0.0100L
0.0100L
0.0100L
0.0100LR

1
0.0100
0.0100L
0.0600
0.1200
0.0200
0.0400
0.0100L
0.0100
0.0100L
0.0600
0.0600R
0.0100L
0.0400
0.0100L
0.0100L
0.2600
3.1000
3.1000R

13
0.0100L
0.0100L
0.0100L
0.1900
0.0900R
0.0200
0.0000B
0.0100L
0.0400
0.1200
0.0100L

7
3.2400
4.9100
0.0800
0.0100L
0.0100L
0.0100R
0.1300
0.0100L
0.0100LR
0.1600
0.0300
0.0300
0.2600
0.7800
0.0100L
0.0100L
0.0100L
0.0100L
0.0100LR

29
3.7800W
1.8500W
0.0100L
0.0300
0.1000W
0.0400W
0.0200R
2.6000
2.5300R
0.6600

9
0.0100L
0.0100L
0.2000
0.0100L
0.0200
0.0200
0.0100L
0.0100L
0.0300W
0.0100L
0.0600
0.0100L
0.0100L
0.0600W
0.0600
0.0100L
0.4300W
0.0100L
0.0100L
0.0100
0.0100LW
0.1200
0.0100L
0.0100LR
0.0200

10
4.4000GH
4.8000
1.1000
0.2600
10.3700
10.9300
11.5600
11.3300
2.1400
3.1600
3.2500R
11.4500
6.8600

26
8.0600
7.2600
0.0800
7.3500

27
3.2100W
3.6000W
0.5200
0.6500
2.1600W
0.0600W
0.0600
2.1800
3.1700W
1.9800W
0.0100L
0.8600
0.0100L
0.0100L
0.0100L
0.0100L
0.0300
0.0000B

6
5.5200W
6.2200
0.0100L
0.7800
4.8000W
3.7000W
0.0100L
0.0100L
0.0400
0.9100
0.7100
0.0600

28
0.0100L
0.0100LR
0.0600
1.6500
0.0500W
0.0200
0.0600

5
0.8000W
2.9600W
0.0100L
0.0100
0.0100L
0.0100L
0.0100L
0.0300
0.0100R
0.0100L
0.0100L
0.0100R
0.0200
0.0100L
0.0600
0.0200R
0.0100
0.0100
0.0100L
0.0100LR
0.0100L
0.0100L

24
0.0600
0.0100
0.0600
0.0100LR
0.0100L

25
1.4500W
1.7500W
0.0100L
0.0100L
0.7400
0.6700RW
0.0100L
0.0100
0.0100R
2.0800
1.9700R

4
0.0200
0.0100L
1.3200
0.0200
0.0100L
0.0100L
0.4600
0.0100L
0.0100
0.0600
0.0100L
0.0100LR
0.0200
0.0100L
0.0600
0.0100L
0.1000
0.1000R

3
0.0100L
1.0500
0.3000
0.2400R
0.2400
0.1800
0.0100L
0.4700
0.0300
0.0300 D
0.0600
0.0100L
0.0100
0.0100LR

23
0.0100
0.0400
0.0100L
0.0100L
0.0100L

32
0.0100L
0.0100L
0.2400
0.2400R
12.6600

31
0.0600
0.0100L
0.0100L
0.6000

2
0.9000
0.4400
4.8100
3.1100
8.1100
5.7300
3.1800
2.7300
4.9200
3.3700
3.9900
5.7500
5.4400R
0.0100L
0.1200

14
0.0300
0.0300
0.0100L
0.0100LR
0.0400
0.0100L
0.0100L
0.0000B
0.0100L
0.0100L
1.9800
0.1200
0.0100
0.3600
1.4900
0.0600
0.2500

22
3.5000
5.0400
6.1300
6.0200R
7.4500

Ag ppm

```
                                                               8
                                                      ·2.0000  0.0000N                                           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                                           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                                           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                                           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                                           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                                           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                                           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                                           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                                           0.0000N                    0.0000N
                                                                                                                     0.0000N                    0.0000N
                                                                                                                     0.0000N                    0.0000N
                                                                                                                     0.0000N
                                                                                                                     0.0000N
                                                                                                                     0.0000N
                                                                                                                     0.0000N
                           0.0000N                                 9                          0.0000N           0.0000N
                           0.0000N  0.0000N           0.0000N           0.0000N                    0.0000N           0.0000N
                           0.0000N  0.0000N           0.0000N           0.0000N                    0.0000N  0.0000N  0.0000N
                           0.0000N  0.0000N           0.0000N           0.0000N                    0.0000N  0.0000N
                           0.0000N  0.0000N           0.0000N           0.0000N                    0.0000N  0.0000N
                           0.0000N  0.0000N           0.0000N           0.0000N                    0.0000N  0.0000N
                           0.0000N  0.0000N           0.0000N           0.0000N                    0.0000N
                           0.0000N  0.0000N           0.0000N           0.0000N                    0.0000N
                           0.0000N  0.0000N           0.0000N           0.0000N                    0.0000N
                           0.0000N  0.0000N           0.0000N           0.0000N                    0.0000N
                                                      0.0000N           0.0000N                    0.0000N
                           0.0000N                                      0.0000N                    0.0000N
                           0.0000N                    0.0000N           0.0000N                    0.0000N
                  0.0000N  0.0000N                    0.0000N           0.0000N
                  0.0000N  0.0000N                    0.0000N           0.0000N
         0.0000N  0.0000N  0.0000N                    0.0000N           0.0000N
         0.0000N  0.0000N  0.0000N                    0.0000N           0.0000N
         0.0000N  0.0000N  0.0000N                    0.0000N           0.0000N
         0.0000N  0.0000N  0.0000N                    0.0000N           0.0000N
         0.0000N  0.0000N  0.0000N                                      0.0000N
         0.0000N  0.0000N  0.0000N                    0.0000N  0.0000N  0.0000N                             0.0000N  0.0000N
         0.0000N  0.0000N  0.0000N                    0.0000N  0.0000N  0.0000NW                            0.0000N  0.0000N
         0.0000N  0.0000N  0.0000N                    0.0000N  0.0000N  0.0000N                             0.0000N  0.0000N
                                                      0.0000N  0.0000N  0.0000N                             0.0000N  0.0000N
                           0.0000N  0.0000N           0.0000N  0.0000N  0.0000NR                            0.0000N
                           0.0000N  0.0000N           0.0000N  0.0000N  3.0000 ←                   2
                           0.0000N  0.0000N           0.0000N  0.0000N                             0.0000N           0.0000N
                           0.0000N  0.0000N           0.0000N  0.0000N                             0.0000N           0.0000N  0.0000N
0.0000N                    0.0000N  0.0000N           0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N  0.0000N
0.0000N                             0.0000N           0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N  0.0000N           0.0000N                             1.0000   0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N  0.0000N           0.0000N                             1.0000   0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N  0.0000N                                               5.0000   0.0000NR          0.0000N  0.0000N
0.0000N           0.0000N  0.0000N  0.0000N                                               3.0000   0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N  0.0000N                                                        0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N
0.0000N  0.0000N  0.0000N  0.0000N                                                                                            0.0000N
0.0000N  0.0000N           0.0000N                                                                                            0.0000N
0.0000N  0.0000N           0.0000N                                                                                            0.0000N
0.0000N  0.0000N                                                                                                              0.0000N
0.0000N  0.0000N                                                                                                              0.0000N
```

p. 2A-16

As ppm

8

9.0170
2.9660
1.0830
0.7530
0.6949R
0.4444
0.5186
3.7630
0.4081

0.4442
0.1000L
0.2498
0.6117
0.4651
0.3394
0.4728
1.1410
1.3160R

1

1.1970
0.8672
0.1937
0.1000L
0.8483
1.7420
0.1000L
0.1000L
0.3263
4.8000
5.5060R
0.3113
0.2607
0.1000L
0.1000L
3.1120
2.5030
2.3970R

13

1.6330
11.8100
9.8880
10.3800
9.6880R
17.2100
8.3240
2.9240
1.9270
3.9120
15.4400

7

0.7719
32.0300
1.6070
4.7490
2.8010
3.1480R
2.2660
3.3570
2.7010R
3.5850

1.6750
0.8022
0.6125
0.2070
0.8511
0.9425
0.2916
0.1000L
0.1928R

29

3.6080W
2.8340W
0.1000L
0.2571L
1.0210W
0.2739W
0.5628R
1.1310
0.9464R
0.4876

28

0.1000L
1.3230R
1.1820
14.9100
10.0300W
1.4620
3.9650

9

0.1000L
0.1000L
1.1180
2.2140
0.5992
0.2365
1.1480
0.3544
16.9100W
2.0980W
1.2530
0.7241
0.1000L
0.1888W
0.3491
1.9260
0.1000L
0.4311W
1.1600
0.4770
0.2099W
0.1000L
5.4650
6.4140R
4.5140

10

1.1210GH
0.3963
0.9743
0.2205
2.5520
4.6930
1.1990
0.6771
12.4500
3.9590
3.5570R
2.5500
1.3930

26

4.6460
12.5700
14.3000
1.2400

6

1.8250W
0.6849W
0.3973
0.4623
2.4450W
3.9740W
6.5150
2.6880
0.7090
0.1926
0.4020
0.6676

27

7.3910
3.4450W
1.1930
0.4512
18.5900
45.4800W
0.9240
2.9490

2.3750
2.6690W
1.2150
0.3913
0.4294
1.6630
0.1000L
0.1000L
0.2667
0.1289

5

0.2820W
0.1106
2.4290
3.0530
2.5670
1.6720
0.1912
0.1000L
0.1000LR
0.1000L
0.1109
0.3714R

0.1000L
0.1000L
1.1370
0.6410R
0.3332
0.4604
1.3880
1.7870R
0.4392
0.4488

32

1.0340
0.9924
2.3700
1.2130R
4.0700

31

1.5560
5.7740
1.5710
0.3970

24

1.9710
0.2480
0.6551
0.1000LR
0.1000L

25

0.2201W
1.5300W
0.1000L
0.5948
1.0040
0.6779RW
0.2955
0.1000L
0.1856R
0.2041
0.4800R

2

0.8754
0.4007G
4.0600
4.1110
18.9600
5.1460

0.1003
0.4156
0.4630
0.6567
0.1311
0.4365
0.1000LR
0.1000L
3.3650

14

5.7830
1.4200
3.1710
3.1510R
1.4560
0.9396
1.7080
0.7285
1.4480

2.5810
0.9609
21.7400
0.8096
0.2748
1.9320
1.2430
4.6830

3

3.0660
0.9681
1.8930
1.6080R
0.1000L
2.1420
1.3410
0.4483
0.9288
1.0560CD
1.3740
0.2668
0.7061
0.2359R

23

0.9060
1.3520
1.5330
1.0570R
0.5156

4

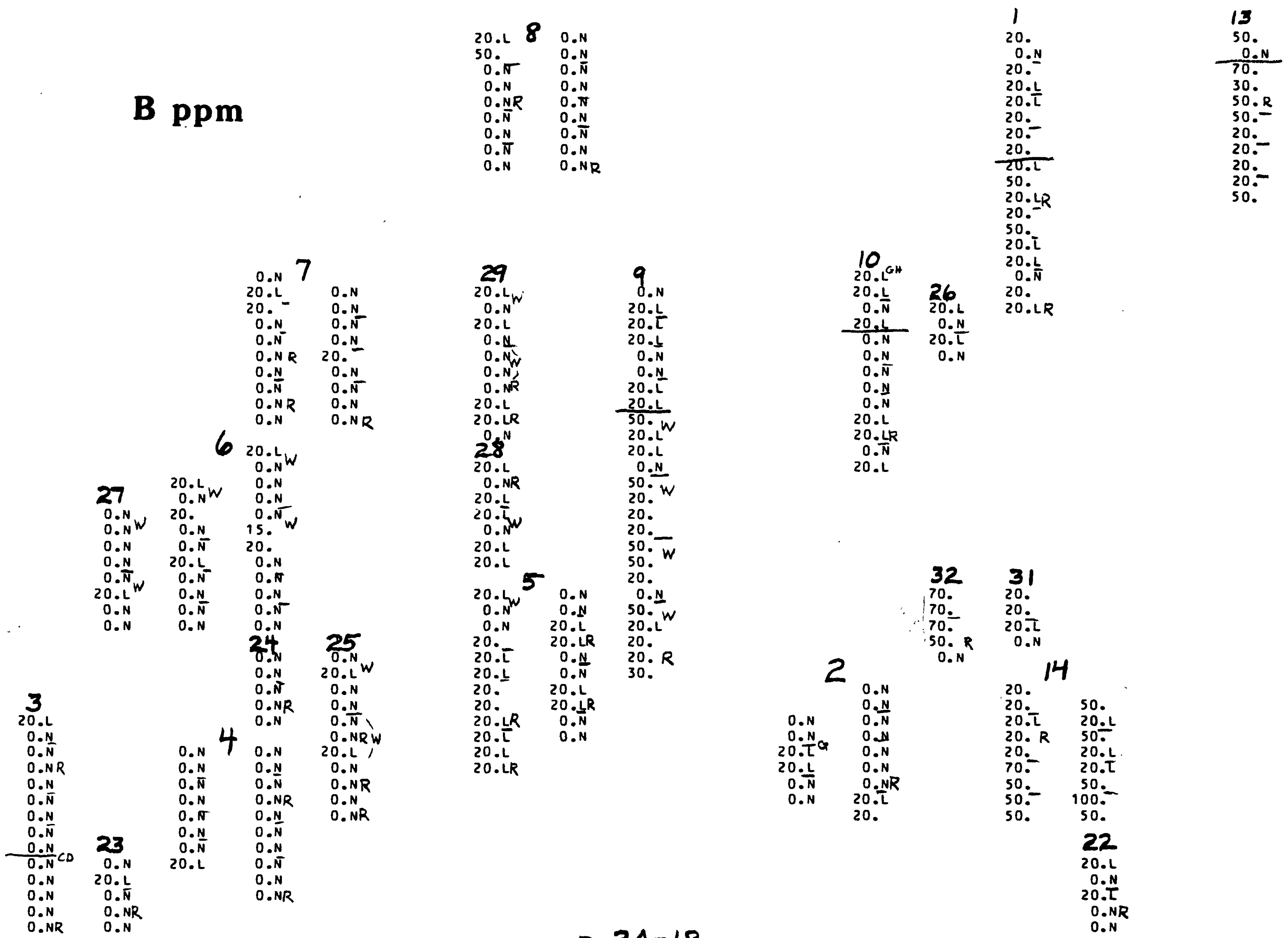
0.4092
1.0110
1.5520
0.2097
0.8686
0.5762
5.4820
0.5892

0.2824
0.9449
0.7241
0.3692R
0.1000L
0.1000L
0.4418
0.1000L
0.3540
0.3359R

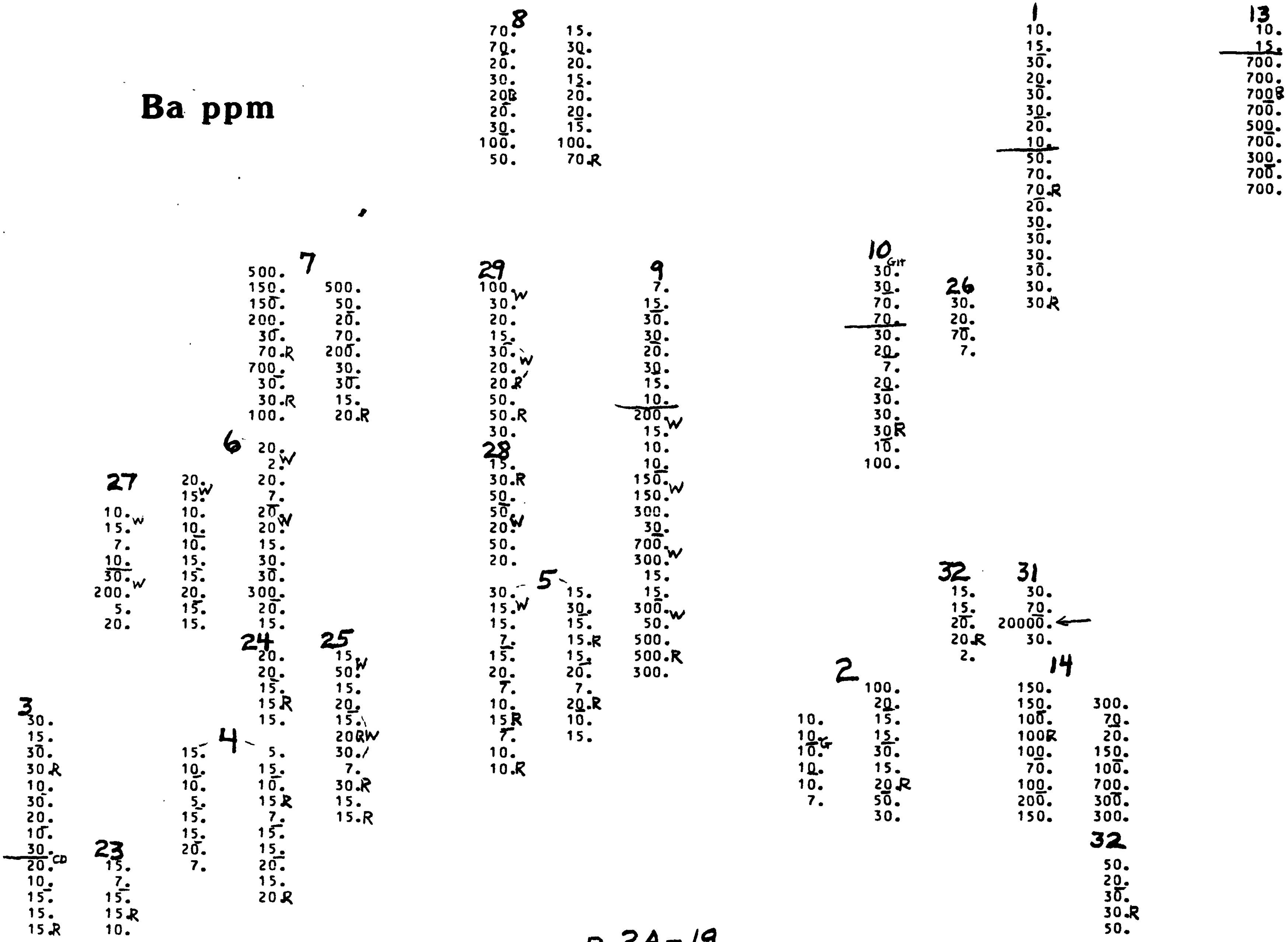
22

4.1740
1.4660
11.3900
6.9300R
1.6770

B ppm


8
20.L
50.
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.NR
1
20.
0.N
20.
20.L
20.L
20.
20.
20.
20.L
50.
20.LR
20.
50.
20.L
20.L
0.N
20.
20.LR
13
50.
0.N
70.
30.
50.R
50.
20.
20.
20.
20.
50.
7
0.N
20.L
20.
0.N
0.N
0.NR
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
0.N
20.
0.N
0.N
0.N
0.NR
29
20.L W
0.N
20.L
0.N
0.N W
0.N
0.NR
20.L
20.LR
0.N
28
20.L
0.NR
20.L
20.L
0.N W
20.L
20.L
9
0.N
20.L
20.L
20.L
0.N
0.N
20.L
20.L
50. W
20.L
20.L
0.N
50. W
20.
20.
20.
50. W
50.
20.
0.N
50. W
20.L
20.
20. R
30.
10 GH
20.L
20.L
0.N
20.L
0.N
0.N
0.N
0.N
0.N
20.L
20.LR
0.N
20.L
26
20.L
0.N
20.L
0.N
6
20.L W
0.N W
0.N
0.N
0.N W
15.
20.
0.N
0.N
0.N
0.N
0.N
20.L
0.N W
20.
0.N
0.N
20.L
0.N
0.N
0.N
0.N
27
0.N
0.N W
0.N
0.N
0.N W
20.L W
0.N
0.N
24
0.N
0.N
0.N
0.NR
0.N
25
0.N W
20.L W
0.N
0.N
0.N
0.NRW
20.L
0.N
0.NR
0.N
0.NR
4
0.N
0.N
0.N
0.N
0.N
0.N
0.N
20.L
0.N
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
0.N
0.NR
3
20.L
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
0.N
0.N CD
0.N
0.N
0.N
0.NR
23
0.N
20.L
0.N
0.NR
0.N
5
20.L W
0.N
0.N
20.
20.L
20.L
20.
20.
20.LR
20.L
20.L
20.LR
0.N
0.N
20.L
20.LR
0.N
0.N
20.L
20.LR
0.N
0.N
32
70.
70.
70.
50. R
0.N
31
20.
20.
20.L
0.N
2
0.N
0.N
20.L G
20.L
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.NR
20.L
20.
14
20.
20.
20.L
20. R
20.
70.
50.
50.
50.
50.
20.L
50.
20.L
20.L
50.
100.
50.
22
20.L
0.N
20.L
0.NR
0.N

Ba ppm


8
70. 70. 20. 30. 20B 20. 30. 100. 50.
15. 30. 20. 15. 20. 20. 15. 100. 70.R
1
10. 15. 30. 20. 30. 30. 20. 10. 50. 70. 70.R 20. 30. 30. 30. 30. 30. 30.R
13
10. 15. 700. 700. 700B 700. 500. 700. 300. 700. 700.
7
500. 150. 150. 200. 30. 70.R 700. 30. 30.R 100.
500. 50. 20. 70. 200. 30. 30. 15. 20.R
29
100.W 30. 20. 15. 30.W 20.R 50. 50.R 30.
28
15. 30.R 50. 50.W 20. 50. 20.
9
7. 15. 30. 30. 20. 30. 15. 10. 200.W 15. 10. 10. 150. 150.W 300. 30. 700. 300.W 15. 15. 300.W 50. 500. 500.R 300.
10 Git
30. 30. 70. 70. 30. 20. 7. 20. 30. 30. 30R 10. 100.
26
30. 20. 70. 7.
6
20. 2W 20. 7. 20W 20. 15. 30. 30. 300. 20. 15.
20. 15.W 10. 10. 10. 15. 15. 20. 15. 15.
27
10.W 15. 7. 10. 30.W 200. 5. 20.
24
20. 20. 15. 15.R 15.
25
15.W 50. 15. 20. 15. 20RW 30. 7. 30.R 15. 15.R
4
15. 10. 10. 5. 15. 15. 20. 7.
5. 15. 10. 15.R 7. 15. 15. 20. 15. 20.R
3
30. 15. 30. 30.R 10. 30. 20. 10. 30. 20.CD 10. 15. 15. 15.R
23
15. 7. 15. 15.R 10.
5
30. 15.W 15. 7. 15. 20. 7. 10. 15.R 7. 10. 10.R
15. 30. 15. 15.R 15. 20. 7. 20.R 10. 15.
32
15. 15. 20. 20.R 2.
31
30. 70. 20000. 30.
2
10. 10.G 10. 10. 10. 7.
100. 20. 15. 15. 30. 15. 20.R 50. 30.
14
150. 150. 100. 100R 100. 70. 100. 200. 150.
300. 70. 20. 150. 100. 700. 300. 300.
32
50. 20. 30. 30.R 50.

Be ppm

```
                                                                                                                                13
                                                0.0000N 0.0000N                                         0.0000N                 0.0000N
                                                0.0000N 0.0000N                                         0.0000N                 0.0000N
                                                0.0000N 0.0000N                                         0.0000N                →2.0000
                                                0.0000N 0.0000N                                         0.0000N                 0.0000N
                                                0.0000N 0.0000N                                         0.0000N                 0.0000N R
                                                0.0000N 0.0000N                                         0.0000N                 0.0000N
                                                0.0000N 0.0000N                                         0.0000N                 0.0000N
                                                0.0000N 0.0000N                                         0.0000N                 0.0000N
                                                0.0000N 0.0000N                                         0.0000N                 0.0000N
                                                                                                        0.0000N                 0.0000N
                                                                                                        0.0000N                 0.0000N
                                                                                                        0.0000N
                                                                                                        0.0000N
                                                                                                        0.0000N
                                                                                                        0.0000N
                        0.0000N                                                         0.0000N         0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N                 0.0000N         0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N                 0.0000N 0.0000N 0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N                 0.0000N 0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N                 0.0000N 0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N                 0.0000N 0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N                 0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N                 0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N                 0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N                 0.0000N
                                                0.0000N         0.0000N                 0.0000N
                        0.0000N                                 0.0000N                 0.0000N
                        0.0000N                 0.0000N         0.0000N                 0.0000N
                0.0000N 0.0000N                 0.0000N         0.0000N
                0.0000N 0.0000N                 0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N                 0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N                 0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N                 0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N                 0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N                                 0.0000N                                 31
        0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N                         0.0000N 0.0000N
        0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N                         0.0000N 0.0000N
        0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N                         0.0000N 5.0000 ←
                                  25                    0.0000N 0.0000N 0.0000N                         0.0000N 0.0000N
                        0.0000N 0.0000Nw                0.0000N 0.0000N 0.0000N                         0.0000N
                        0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N
                        0.0000N 0.0000N                 0.0000N 0.0000N                         0.0000N         0.0000N
                        0.0000N 1.5000L←                0.0000N 0.0000N                         0.0000N         0.0000N 0.0000N
0.0000N                 0.0000N 0.0000N                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N                         0.0000NRW               0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N                         0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N                         0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000NR                                                0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000NR                                                        0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N
0.0000N 0.0000N 0.0000N 0.0000N                                                                                         0.0000N
0.0000N 0.0000N         0.0000N                                                                                         0.0000N
0.0000N 0.0000N         0.0000N                                                                                         0.0000N
0.0000N 0.0000N                                                                                                         0.0000N
0.0000N 0.0000N                                                                                                         0.0000N
```

Br ppm

8
```
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 1.9480
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
```

1
```
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000LR
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.8598 R
```

13
```
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
```

7
```
0.5000L
0.5077  0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
```

6
```
0.8235 W
0.9752
0.5000L
0.5000L
0.7191
0.5000L W
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
```

27
```
                0.7355 W
                0.5000L
0.6460          0.5000L
0.5000L W       0.5000L
0.5000L         0.5000L
0.5000L         0.5000L
0.5000L         0.5000L
0.5000L W       0.5000L
0.5000L         0.5000L
0.5000L         0.5000L
```

29
```
0.6337 W
0.5000L
0.5000L
0.5000L
0.5000L W
0.5000LR
0.5000L
0.5526 R
0.5000L
```

28
```
0.5000L
0.5000LR
0.5548
0.5000L
0.5000L W
0.5000L
0.5000L
```

9
```
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L W
0.5000L
0.5000L
0.5000L
0.5000L W
0.5000L
0.5000L
0.5000L
0.5000L W
0.6491
0.5000L
0.5000L W
0.5000L
0.5000L
0.5000LR
0.5000L
```

5
```
0.5000L   0.5000L
0.9029 W  0.5000L
0.5000L   0.5000L
0.5000L   0.5000LR
0.5000L   0.5000L
0.5000L   0.5000L
0.5000L   0.5000L
0.5000L   0.5000LR
0.5000L   0.5000L
0.5000L   0.5000L
0.5000L
0.5000L
```

10
```
1.7120 GH
1.8490
0.5000L
0.5000L
2.9070
3.6650
4.3820
4.6500
0.9248
1.5080
1.3340 R
2.3040
3.5780
```

26
```
1.4480
0.9525
0.5000L
4.1220
```

24 25
```
0.5000L 0.5000L
0.5000L 0.5000L W
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
        0.5000LRW
        0.5000L
        0.5000L
        0.5000LR
        0.5000L
        0.5000LR
```

4
```
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
        0.5000L
        0.5000L
```

3
```
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
```

23
```
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
```

32 31
```
0.5000L   0.5000L
0.5000L   0.5000L
0.5000L   0.5000L
0.5000LR  0.8912
6.7830
```

2
```
          0.5000L
          0.5000L
0.5000L   0.5000L
0.5000L   0.5000L
0.7738 G  0.8904
0.5000L   1.1630
0.9941    1.2080 R
0.9240    0.5000L
          0.5000L
```

14
```
0.5000L
0.5000L   0.5000L
0.5000L   0.5000L
0.5000LR  0.5000L
0.5000L   0.5000L
0.5000L   0.5000L
0.8975    1.8250
0.5000L   0.5000L
0.5000L   0.5000L
```

22
```
0.5000L
0.7237
0.9587
1.3830 R
1.5210
```

p. 2A-21

Cd ppm

```
                                        0.0000B 0.0000B                                 0.0000B         0.0000B
                                        0.0000B 0.0000B                                 0.0000B         0.0000B
                                        0.0000B 0.0000B                                 0.0000B         0.0000B
                                        0.0000B 0.0000B                                 0.0000B         0.0000B
                                        0.0000B 0.0000B                                 0.0000B         0.0000B
                                        0.0000B 0.0000B                                 0.0000B         0.0000B
                                        0.0000B 0.0000B                                 0.0000B         0.0000B
                                        0.0000B 0.0000B                                 0.0000B         0.0000B
                                        0.0000B 0.0000B                                 0.0000B         0.0000B
                                                                                        0.0000B         0.0000B
                                                                                        0.0000B         0.0000B
                                                                                        0.0000B
                                                                                        0.0000B
                                                                                        0.0000B
                                                                                        0.0000B
                        0.0000B                                         0.0000B         0.0000B
                        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B         0.0000B
                        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B 0.0000B 0.0000B
                        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B 0.0000B
                        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B 0.0000B
                        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B 0.0000B
                        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B
                        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B
                        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B
                        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B
                                        0.0000B         0.0000B         0.0000B
                        0.0000B                         0.0000B         0.0000B
                        0.0000B         0.0000B         0.0000B         0.0000B
                0.0000B 0.0000B         0.0000B         0.0000B
                0.0000B 0.0000B         0.0000B         0.0000B
        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B
        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B
        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B
        0.0000B 0.0000B 0.0000B         0.0000B         0.0000B
        0.0000B 0.0000B 0.0000B                         0.0000B
        0.0000B 0.0000B 0.0000B         0.0000B 0.0000B 0.0000B                 0.0000B 0.0000B
        0.0000B 0.0000B 0.0000B         0.0000B 0.0000B 0.0000B                 0.0000B 0.0000B
        0.0000B 0.0000B 0.0000B         0.0000B 0.0000B 0.0000B                 0.0000B 0.0000B
                                        0.0000B 0.0000B 0.0000B                 0.0000B 0.0000B
                        0.0000B 0.0000B 0.0000B 0.0000B 0.0000B                 0.0000B
                        0.0000B 0.0000B 0.0000B 0.0000B 0.0000B         2
                        0.0000B 0.0000B 0.0000B 0.0000B                 0.0000B         0.0000B
                        0.0000B 0.0000B 0.0000B 0.0000B                 0.0000B         0.0000B 0.0000B
0.0000B                 0.0000B 0.0000B 0.0000B 0.0000B         0.0000B 0.0000B         0.0000B 0.0000B
0.0000B                         0.0000B 0.0000B 0.0000B         0.0000B 0.0000B         0.0000B 0.0000B
0.0000B         0.0000B 0.0000B 0.0000B 0.0000B                 6.0000  0.0000B         0.0000B 0.0000B
0.0000B         0.0000B 0.0000B 0.0000B 0.0000B                 5.0000  0.0000B         0.0000B 0.0000B
0.0000B         0.0000B 0.0000B 0.0000B                         1.0000L 0.0000B         0.0000B 0.0000B
0.0000B         0.0000B 0.0000B 0.0000B                         4.0000  0.0000B         0.0000B 0.0000B
0.0000B         0.0000B 0.0000B 0.0000B                                 0.0000B         0.0000B 0.0000B
0.0000B         0.0000B 0.0000B
0.0000B         0.0000B 0.0000B
0.0000B 0.0000B 0.0000B 0.0000B                                                                 0.0000B
0.0000B 0.0000B         0.0000B                                                                 0.0000B
0.0000B 0.0000B         0.0000B                                                                 0.0000B
0.0000B 0.0000B                                                                                 0.0000B
0.0000B 0.0000B                                                                                 0.0000B
```

p.2A - 22

Co ppm

```
          8
0.0000N 7.0000
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

```
                               1                             13
                              0.0000N                       0.0000N
                              0.0000N                       0.0000N
                              0.0000N                      10.0000
                              0.0000N                       5.0000L
                              0.0000N                       5.0000
                              0.0000N                       0.0000N
                              0.0000N                       5.0000
                              0.0000N                       0.0000N
                              0.0000N                       5.0000L
                              0.0000N                       5.0000
                              0.0000N                       5.0000L
                              0.0000N
                              0.0000N
                              0.0000N
            10                0.0000N
          0.0000NGit          0.0000N
          0.0000N   26        0.0000N
          0.0000N   0.0000N   0.0000N
          0.0000N   0.0000N
          0.0000N   0.0000N
          0.0000N   0.0000N
          0.0000N
          0.0000N
          0.0000N
          0.0000N
          0.0000NR
         10.0000 ←
          0.0000N

                      32        31
                    0.0000N   0.0000N
                    0.0000N   5.0000L
                    0.0000N   0.0000N
                    0.0000NR  0.0000N
                    0.0000N
         2                                14
          0.0000N             5.0000
          0.0000N             0.0000N   5.0000L
0.0000N   0.0000N             0.0000N   0.0000N
0.0000N   0.0000N             0.0000NR  0.0000N
0.0000N   0.0000N             0.0000N   0.0000N
0.0000N   0.0000N             0.0000N   0.0000N
0.0000N   0.0000NR            0.0000N   0.0000N
0.0000N   0.0000N             5.0000    7.0000
          0.0000N             5.0000    0.0000N

                                          22
                                        0.0000N
                                        0.0000N
                                        0.0000N
                                        0.0000N
                                        0.0000N
```

```
   29                 9
0.0000NW            0.0000N
0.0000N             0.0000N
0.0000N             0.0000N
0.0000N             5.0000
0.0000NW            0.0000N
0.0000N             0.0000N
0.0000NR            0.0000N
0.0000N             0.0000N
0.0000NR            0.0000NW
0.0000N             5.0000L
   28               0.0000N
0.0000N             0.0000N
0.0000NR            0.0000NW
0.0000N             0.0000N
0.0000N             0.0000N
0.0000NW            0.0000N
0.0000N             5.0000
0.0000N             0.0000NW
           5        5.0000L
5.0000L   0.0000N   0.0000N
0.0000NW  0.0000N   0.0000NW
0.0000N   0.0000N   0.0000N
5.0000    0.0000N   5.0000
0.0000N   0.0000N   5.0000LR
0.0000N   0.0000N   5.0000
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N
0.0000N
```

```
                              0.0000N  7
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                             6
                              0.0000NW
                              0.0000N
                    5.0000    0.0000N
             27     0.0000NW  0.0000N
          0.0000NW  0.0000N   0.0000NW
          0.0000N   0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N
          0.0000NW  0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N
                                 24        25
                              0.0000N   0.0000NW
                              0.0000N   0.0000N
                              0.0000N   0.0000N
  3                           0.0000N   0.0000N
0.0000N                       0.0000N   0.0000N
0.0000N                       4         0.0000NRW
0.0000N             0.0000N   0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000N
0.0000N             0.0000N   0.0000N
0.0000N      23     0.0000N   0.0000N
0.0000N   0.0000N   0.0000N   0.0000N
0.0000N   0.0000N             0.0000N
0.0000N   0.0000N             0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
```

Cr ppm

8
1.0000 1.0000
20.0000 1.0000
1.0000 1.0000
1.0000L 1.0000
1.0000LR 2.0000
1.0000 1.0000L
2.0000 1.0000
1.0000L 1.0000
1.0000 0.0000NR

1
1.0000
1.0000L
1.0000
1.0000
2.0000
1.0000
1.0000
1.0000
1.0000
2.0000
5.0000R
1.0000
1.0000
1.0000
1.0000
1.0000
3.0000 <
5.0000R

13
1.0000L
1.0000L
20.0000
10.0000
High 15.0000R
30.0000
10.0000
15.0000
7.0000
20.0000
15.0000

7
1.0000
20.0000 1.0000
1.0000L 1.0000
0.0000N 1.0000
1.0000 1.0000
0.0000NR 7.0000
1.0000 1.0000L
1.0000 1.0000
1.0000R 0.0000N
0.0000N 1.0000LR

6
20.0000
10.0000W
5.0000 1.0000L
1.0000W 1.0000L

27
2.0000 1.0000 7.0000
1.0000W 1.0000L 30.0000W
1.0000L 1.0000L 2.0000
1.0000 1.0000 1.0000
2.0000 1.0000L 1.0000L
1.0000W 1.0000L 1.0000L
1.0000 2.0000 1.0000L
5.0000 1.0000 1.0000L

24 25
1.0000L 1.0000
1.0000 5.0000W
0.0000N 1.0000L
1.0000LR 0.0000N
0.0000N 1.0000
0.0000NRW

4
1.0000L 1.0000 1.0000
1.0000L 1.0000 1.0000
1.0000 1.0000L 1.0000LR
1.0000 1.0000LR 1.0000L
1.0000 1.0000 0.0000NR
1.0000L 1.0000L
1.0000 1.0000
1.0000L 1.0000
1.0000
1.0000R

3
1.0000L
1.0000
2.0000
1.0000R
0.0000N
1.0000
1.0000L
1.0000L
1.0000L

23
1.0000 CD 1.0000
0.0000N 1.5000
1.0000L 1.0000L
1.0000L 1.0000LR
1.0000R 2.0000

29
2.0000
1.0000W
2.0000
1.0000L
1.0000L
1.0000W
1.0000R
2.0000
2.0000R
1.0000

28
1.0000
2.0000R
2.0000
5.0000
1.0000W
1.0000
0.0000N

5
1.0000 2.0000
1.0000W 1.0000
1.0000L 1.0000
1.0000 1.0000R
1.0000 1.0000
1.0000 1.0000L
1.0000 1.0000
1.0000L 1.0000LR
1.0000LR 1.0000
1.0000L 1.0000
0.0000N
1.0000LR

9
0.0000N
1.0000L
2.0000
1.0000
1.0000L
1.0000
1.0000L
1.0000
7.0000
1.0000W
1.0000L
1.0000L
7.0000
10.0000W
10.0000
3.0000
20.0000
20.0000W
5.0000
1.0000
7.0000W
2.0000
15.0000
15.0000R
15.0000

10
2.0000 4H
2.0000

26
1.0000 10.0000
1.0000 10.0000
1.0000 2.0000
2.0000 2.0000
1.0000
1.0000
2.0000
5.0000
5.0000R
1.0000
5.0000

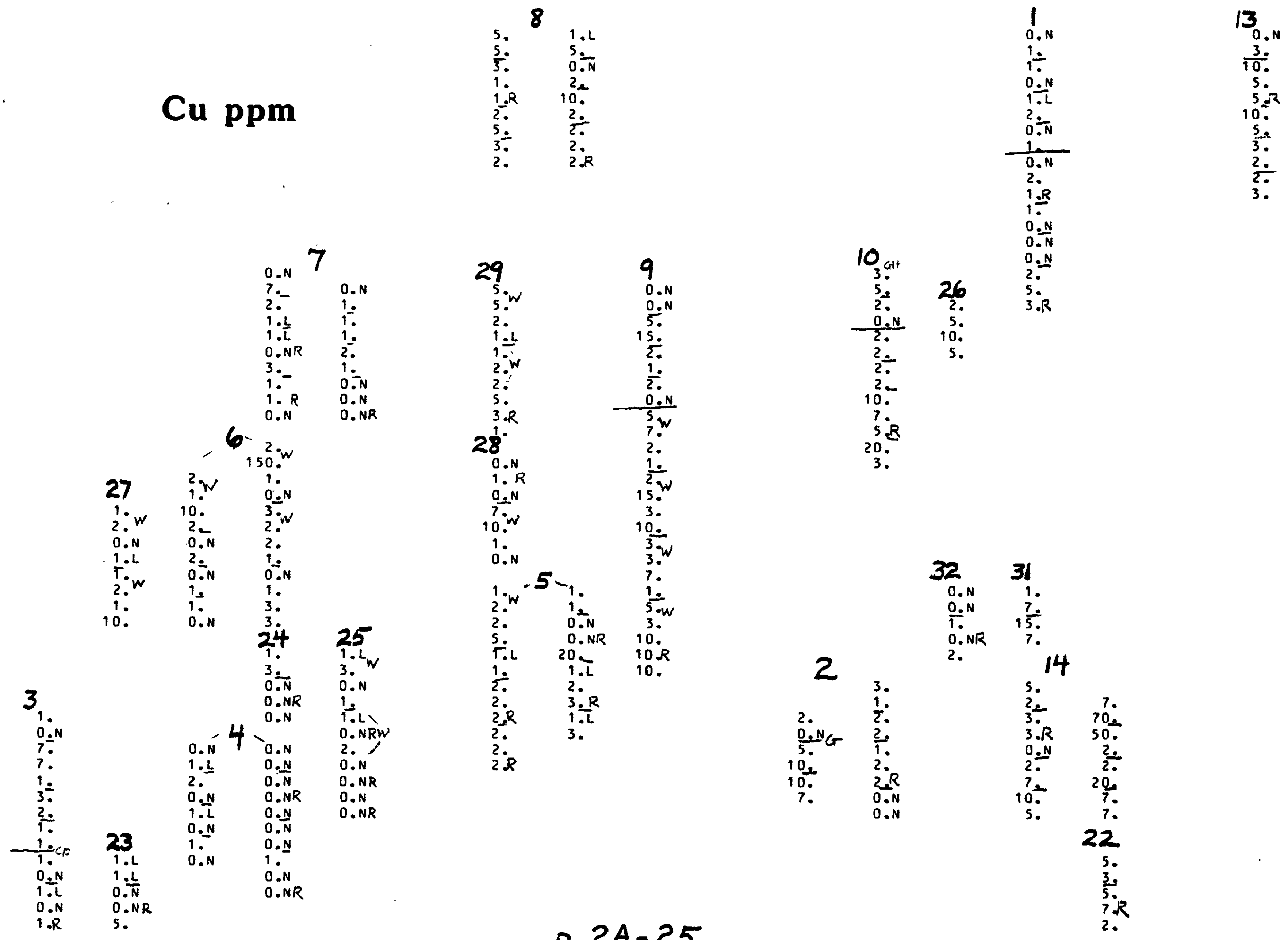
32 31
1.0000 2.0000
1.0000 5.0000
2.0000 7.0000
2.0000R 1.0000
1.0000

2
1.0000
1.0000
1.0000L 2.0000
1.0000L 1.0000
1.0000 G 1.0000
1.0000 1.0000
1.0000 1.5000R
1.0000 5.0000
5.0000

14
7.0000
5.0000 30.0000
2.0000 15.0000
5.0000R 2.0000
2.0000 5.0000
15.0000 3.0000
High 10.0000 20.0000
15.0000 30.0000
7.0000 20.0000

22
5.0000
2.0000
2.0000
5.0000R
1.0000

Cu ppm


8
5. 5. 3. 1. 1.R 2. 5. 3. 2.
1.L 5. 0.N 2. 10. 2. 2. 2. 2.R
1
0.N 1. 1. 0.N 1.L 2. 0.N 1. 0.N 2. 1.R 1. 0.N 0.N 0.N 2. 5. 3.R
13
0.N 3. 10. 5. 5.R 10. 5. 3. 2. 2. 3.
7
0.N 7. 2. 1.L 1.L 0.NR 3. 1. 1. R 0.N
0.N 1. 1. 1. 2. 1. 0.N 0.N 0.NR
29
5. 5.W 2. 1.L 1. 2.W 2. 5. 3.R 1.
28
0.N 1. R 0.N 7.W 10. 1. 0.N
9
0.N 0.N 5. 15. 2. 1. 2. 0.N 5.W 7. 2. 1. 2.W 15. 3. 10. 3.W 3. 7. 1. 5.W 3. 10. 10.R 10.
10 Gt
3. 5. 2. 0.N 2. 2. 2. 2. 10. 7. 5.R 20. 3.
26
2. 5. 10. 5.
6
2.W 150. 1. 0.N 3.W 2. 2. 1. 0.N 1. 3. 3.
2.W 1. 10. 2. 0.N 2. 0.N 1. 1. 0.N
27
1. 2.W 0.N 1.L T. 2.W 1. 10.
5
1.W 2. 2. 5. 1.L 1. 2. 2. 2.R 2. 2. 2.R
1. 1. 0.N 0.NR 20. 1.L 2. 3.R 1.L 3.
24
1. 3. 0.N 0.NR 0.N
25
1.L W 3. 0.N 1. 1.L 0.NRW 2. 0.N 0.NR 0.N 0.NR
4
0.N 1.L 2. 0.N 1.L 0.N 1. 0.N
0.N 0.N 0.N 0.NR 0.N 0.N 0.N 1. 0.N 0.NR
3
1. 0.N 7. 7. 1. 3. 2. 1. 1. Cp 1. 0.N 1.L 0.N 1.R
23
1.L 1.L 0.N 0.NR 5.
32
0.N 0.N 1. 0.NR 2.
31
1. 7. 15. 7.
2
2. 0.N G 5. 10. 10. 7.
3. 1. 2. 2. 1. 2. 2.R 0.N 0.N
14
5. 2. 3. 3.R 0.N 2. 7. 10. 5.
7. 70. 50. 2. 2. 20. 7. 7.
22
5. 3. 5. 7.R 2.

Ga ppm

```
        8
0.0000N 0.0000N
5.0000  0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N

1
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

13
0.0000N
0.0000N
10.0000
5.0000
7.0000 R
7.0000
5.0000
7.0000
5.0000
5.0000
7.0000

        7
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N

29
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000NR
0.0000N
0.0000NR
0.0000N

9
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
5.0000
0.0000N W
0.0000N
0.0000N
5.0000
5.0000 W
5.0000
0.0000N
7.0000
7.0000 W
0.0000N
0.0000N
5.0000
0.0000N W
5.0000
5.0000 R
7.0000

10
0.0000N G#
0.0000N
0.0000N
0.0000N
0.0000N
5.0000L
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
5.0000L

26
5.0000L
5.0000L
0.0000N
0.0000N

          6
          0.0000N W
          0.0000N
0.0000N   0.0000N
0.0000N W 0.0000N
0.0000N   0.0000N
0.0000N   0.0000N W
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N

28
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N

27
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N

          5
0.0000N   0.0000N
0.0000N W 0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N
0.0000N

32
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N

31
0.0000N
0.0000N
5.0000L
0.0000N

24
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N

25
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000NRW
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

          2
          0.0000N
          0.0000N
5.0000L   0.0000N
0.0000N   0.0000N
0.0000N G 0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
          0.0000N

          14
0.0000N
0.0000N   7.0000
0.0000N   0.0000N
0.0000NR  0.0000N
0.0000N   0.0000N
5.0000    0.0000N
5.0000    5.0000
5.0000    5.0000
0.0000N   5.0000

3
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N CB
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

          4
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000NR
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
          0.0000N
          0.0000NR

23
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N

22
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

P. 2A-26

Ge ppm

8
0.6269 0.5455
1.4900 0.5969
0.4901 0.5290
0.4985 0.5488
0.8155R 0.8721
0.7886 0.5414
0.8972 0.6727
0.4769 0.4310
0.5110 0.6848R

1
0.6423
0.7474
0.5497
0.5384
0.8723
0.6599
0.4878
0.7136
0.7773
0.7644
0.9059R
0.7094
0.6583
0.6500
0.3302
0.5988
0.6143
0.4192R

13
0.8397
0.5963
0.9775
1.3070
1.1160R
0.8546
0.5622
0.7900
0.6065
0.7544
1.2190

7
0.4222
0.1000L 1.1490
0.8892 0.6866
0.5583 0.6628
0.5906 0.3103
0.7766R 0.5197
0.9439 0.2720
0.5661 0.5011
0.3402R 0.2571
0.4166 0.5334R

29
0.6163W
0.4023
0.4231
0.5144
0.6724W
0.5092/
0.5587R
0.5004
0.6165R
0.6537

9
0.5287
0.4936
0.7183
0.6930
0.6781
0.5748
0.5391
0.5356
0.7845W
0.7142
0.6061
0.6401
0.5336W
0.4723
0.3601
0.7140
0.8068W
0.8029
0.3982
0.4424
0.7532W
0.3189
0.6149
0.6050R
0.6311

10 GH
0.4538
0.5375
0.8444
0.7553
0.7919
0.4503
0.3150
0.4541
0.8536
0.2797
0.3094R
0.3894
1.0250

26
0.5132
0.3168
1.2390
0.2865

6
0.3837W
0.3824
0.5482
0.5459
1.2090W
1.1720
1.4370
0.9110
0.5359
0.5059
0.3878
0.6390

27
0.4632W
0.5620W
0.4614W 0.6099
0.1680W 0.4795
0.8369 0.5778
0.4691 0.5422
0.3820W 0.3463
0.5810W 0.4291
0.6331 0.4078
0.4692 0.4810

28
0.3526
0.6216R
0.4210
0.7769W
0.5917
0.6162
0.4064

5
0.5222W 0.4365
0.4584 0.2662
0.3711 0.7979
0.4922 0.4103R
0.6346 0.5307
0.7121 1.3790
0.7064 1.7770
0.3387 2.1650R
0.3722R 1.3480
0.4006 1.3810
0.5904
0.4909R

32
1.6260
1.4910
0.5225
0.9425R
0.1298

31
0.7463
0.8629
4.5630
0.7067

24
0.6470
0.4812
0.3980
0.3942R
0.3673

25
0.3640W
0.5144
0.3942
0.5006
0.6698
0.5100RW
0.5466/
0.4952
0.6241R
0.4528
0.4650R

2
0.7925
0.8753
1.0350 0.7451
1.2910G 0.6350
0.4849 0.4921
0.6521 0.4805
0.3261 0.2770R
0.7079 0.9244
1.7650

14
1.0640
0.9504 1.0550
1.0550 0.8137
1.2370R 1.4270
0.4294 0.8682
0.6591 0.4988
0.5644 0.6666
0.8468 0.6488
0.6850 0.8568

3
0.5944
0.2356
0.7104
0.7148R
0.5402
0.4875
0.5865
0.4001
0.4658
0.4606 cD

4
0.5284 0.4572
0.4892 0.5230
0.4976 0.4743
0.4784 0.4484R
0.7545 0.6078
0.6828 0.1917
0.4808 0.5518
0.5081 0.4185
0.5997
0.4767R

3 (continued) **23**
0.5215 0.6424
0.4798 0.3694
0.6623 0.3483R
0.5883R 0.6354

23
0.6979
0.6424
0.3694
0.3483R
0.6354

22
0.9954
0.4348
0.5900
0.2871R
0.3304

p.2A-27

Hg ppm

8
0.0500
0.0400
0.0500
0.0200
0.0100R
0.0200
0.0200
0.0500
0.0300
0.0200
0.0200
0.0200
0.0100
0.0200
0.0200
0.0200
0.0200
0.0200R

1
0.0100
0.0100L
0.0100L
0.0100
0.0100
0.0200
0.0100L
0.0100L
0.0100L
0.0200
0.0200R
0.0100L
0.0100L
0.0100
0.0100
0.0100L
0.0100
0.0100R

low

13
0.0100
0.0200
0.0200
0.0100
0.0100LR
0.0200
0.0200
0.0100
0.0100
0.0100
0.0100

7
0.0700
0.2000
0.1000
0.0800
0.1700
0.2000R
→ 5.4000
0.0700
0.0700R
0.0400
0.0100L
0.0200
0.0100
0.0700
0.0700
0.0100
0.0100
0.0100
0.0100LR

29
0.0200
0.0100W
0.0100L
0.0100
0.0200
0.0200W
0.0200R
0.0300
0.0200R
0.0200

9
0.0200
0.0100
0.0200
0.0200
0.0200
0.0100
0.0100
0.0100
0.0200W
0.0100
0.0100
0.0100
0.0100L
0.0200W
0.0200
0.0100
0.0100W
0.0100L
0.0100
0.0100
0.0100W
0.0200
0.0300
0.0200R
0.0300

10
0.0200
0.0200
0.0100
0.0100
0.0200
0.0300
0.0500
0.0100
0.0100
0.0200
0.0200R
0.0300
0.0300

26
0.0200
0.0300
0.0200
0.0200

6
0.0400W
0.0200
0.0200
0.0200
0.0300W
0.0400W
0.0600
0.0100
0.0500
0.0100
0.0100
0.0200

27
0.1000W
0.0600W
0.0200
0.0100
0.8300
0.9000W
0.0400
0.2200

0.0400W
0.0300W
0.0200
0.0300
0.0200
0.0900
0.0200
0.0200
0.0200
0.0100

28
0.0200
0.0200R
0.0400
0.1800W
→ 2.3000
0.0200
0.0700

5
0.0100L
0.0100W
0.0100
0.0100L
0.0400
0.0200
0.0200
0.0100
0.0200R
0.0200
0.0100
0.0100R
0.0200
0.0100
0.0200
0.0100R
0.0200
0.0100
0.1100
0.0400R
0.0300
0.0200

32
0.0300
0.0200
0.0100
0.0200R
0.0200

31
0.0200
0.0800
0.3700 ←
0.0300

24
0.0100
0.0100
0.0100
0.0200R
0.0200

25
0.0200W
0.0200
0.0100
0.0100
0.0300
0.0100LRW
0.0200
0.0200
0.0100LR
0.0200
0.0100R

2
0.0400
0.0300
0.0300
0.0200
0.0200
0.0400
0.0300R
0.0400
0.0300

0.0200
0.0100
0.0200
0.0300
0.0800
0.0300

14
→ 0.3000
0.0200
0.1200
0.1100R
0.1600
0.0400
0.0600
0.0200
0.0400
0.0200
0.0200
0.0200
0.0100L
0.0100
0.0300
0.0100
0.0200

3
0.0200
0.0100
0.0100
0.0100R
0.0100
0.0300
0.0200
0.0200
0.0200
0.0200 cp
0.0200
0.0100
0.0100
0.0300R

4
0.0100
0.0100
0.0100
0.0200R
0.0100
0.0100
0.0100L
0.0100
0.0200
0.0100R

0.0200
0.0100
0.0100
0.0200
0.0100
0.0100
0.0200
0.0100L

23
0.0100
0.0200
0.0100
0.0100R
0.0100

22
0.0300
0.0300
0.0400
0.0400R
0.0200

p. 2A-28

I ppm

8
```
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 1.3140
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
```

1
```
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
|0.5163
0.5000L
|0.6114 R
```

13
```
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
```

7
```
0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
```

27, 6
```
                          0.5000L
                          0.5000L W
                  0.5000L 0.5000L
                  0.5000L W 0.5000L
   0.5000L        0.5000L 0.5000L W
-> 0.7683 W       0.5000L 0.5000L
   0.5000L        0.5000L 0.5000L
   0.5000L        0.5000L 1.0130
   0.5000L        0.5000L 0.5000L
   0.5000L        0.5000L 0.5000L
   0.5000L        0.5000L 0.5000L
   0.5000L        0.5000L 0.5000L
```

24, 25, 4
```
        0.5000L 0.5000L
        0.5000L 0.5000L
        0.5000L 0.5000L
        0.5000L 0.5000L
        0.5000L 0.5000L
                0.5000L
0.5000L 0.5000L 0.5000L
0.5000L 0.5000L 0.5000L
0.5000L 0.5000L 0.5000L
0.5000L 0.5000L 0.5000L
0.5000L 0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
        0.5000L
        0.5000L
```

3, 23
```
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
```

29, 28, 5, 9
```
   0.8417 W                   0.5000L
   0.7122                     0.5000L
   0.5000L                    0.5000L
   0.5000L                    0.5000L
   0.5000L W                  0.5000L
   0.5000L                    0.5000L
   0.5000L                    0.5000L
   0.5000L                    0.5000L
   0.5000L                    0.5000L
   0.5000L                    0.5000L
                              0.5000L
   0.5000L                    0.5000L
   0.5000L R                  0.5000L
-> 0.6463                     0.5000L
   0.5000L                    0.5000L
   0.5000L                    0.5000L
   0.5000L                    0.5000L
   0.5000L                    0.5000L
   0.5000L    0.5000L         0.5000L
   0.5000L    0.5000L         0.5000L
   0.5000L    0.5000L         0.5000L
   0.5000L    0.5000L         0.5000L
   0.5000L    0.5000L         0.5000L
   0.5000L    0.5000L         0.5000L
   0.5000L    0.5000L
   0.5000L    0.5000L
   0.5000L    0.5000L
   0.5000L    0.5000L
   0.5000L
   0.5000L
```

10, 26
```
0.5000L
0.5271
0.5275  0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5759  0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.6524 R
1.0510
1.6490
```

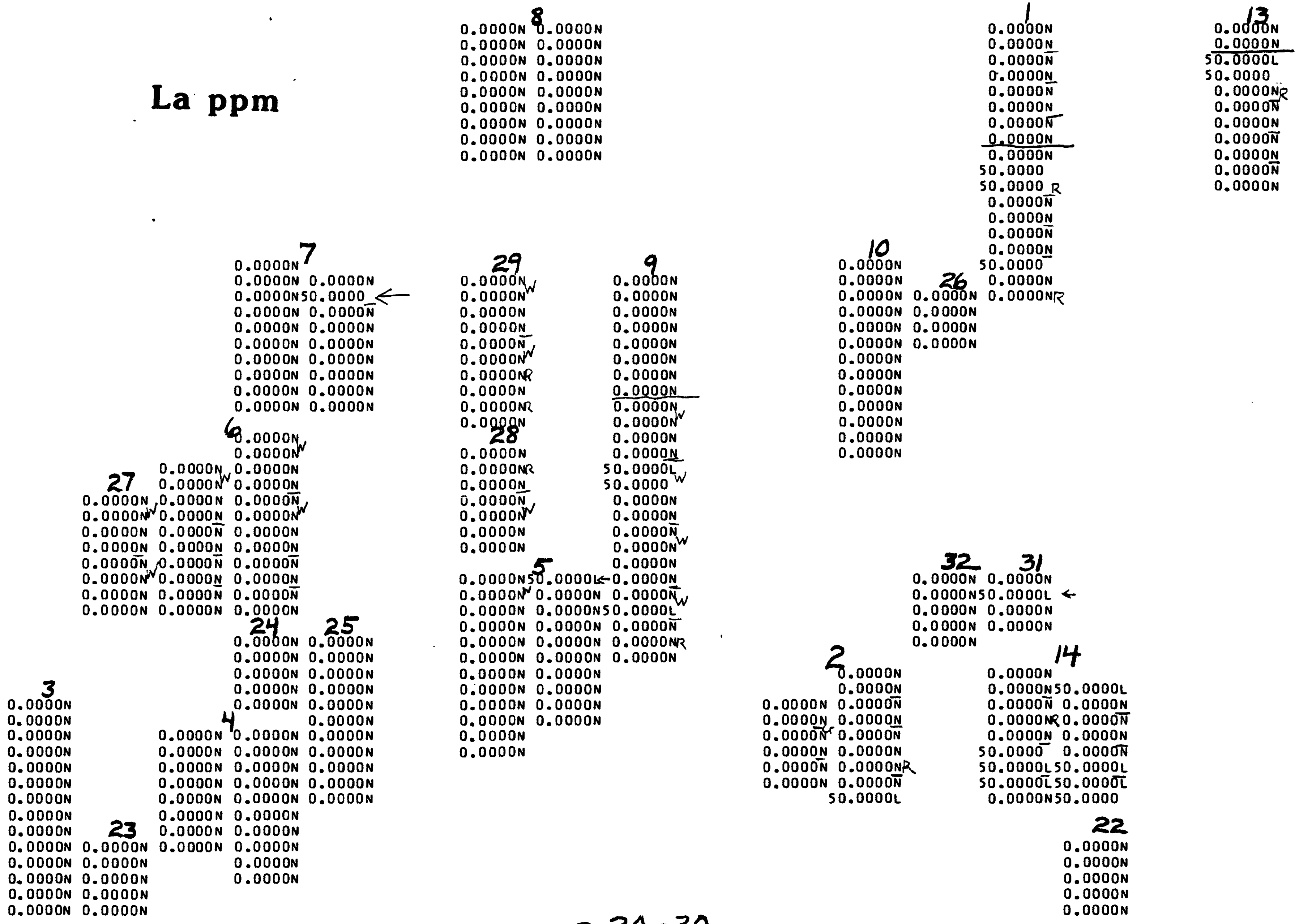
32, 31
```
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L
```

2
```
        0.5000L
        0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
        0.5000L
```

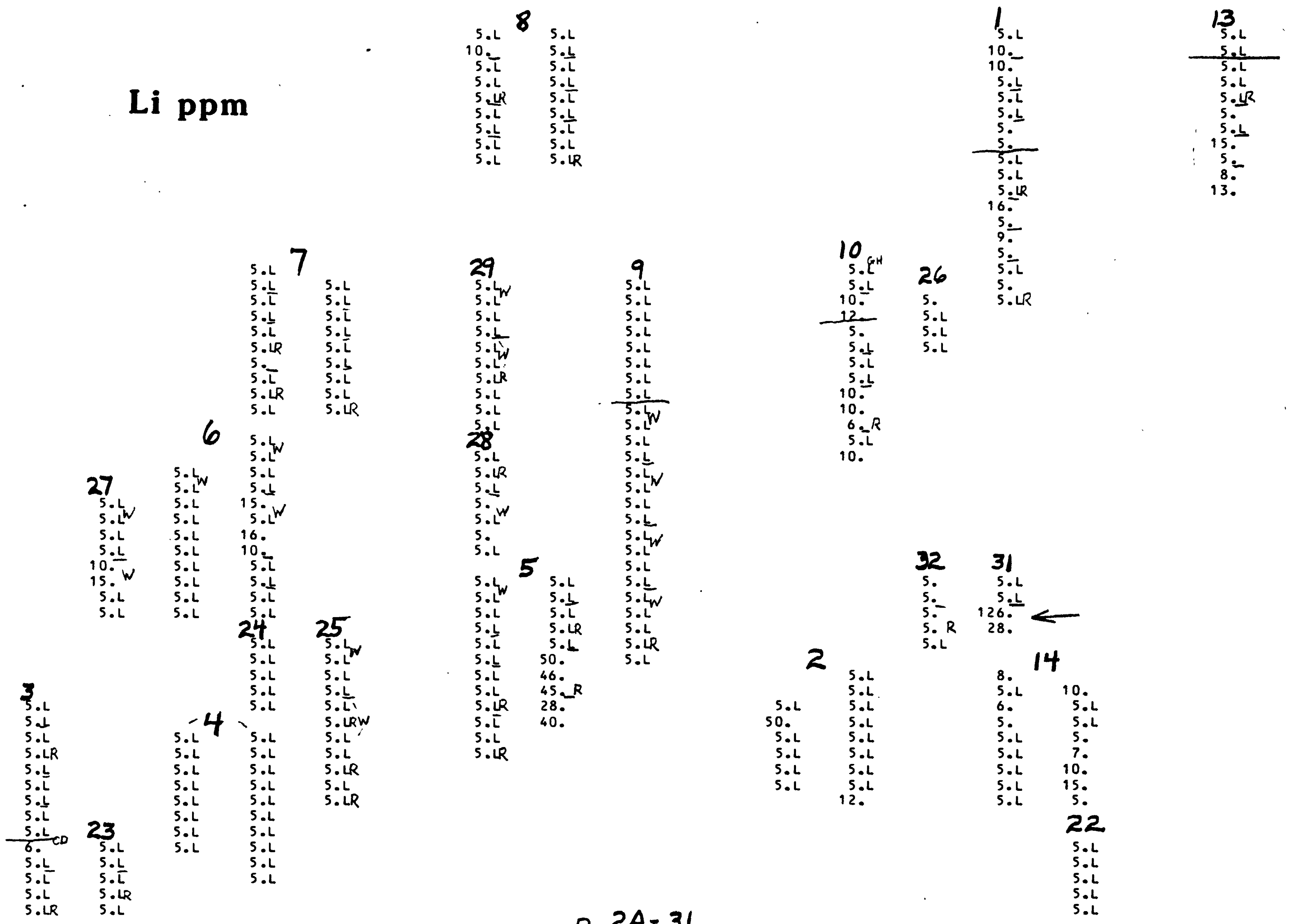
14
```
0.5000L
0.5000L 0.5000L
0.5000L 1.2320
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
1.1890  5.9400 <-
0.5000L 0.5000L
0.5184  0.5000L
```

22
```
1.0750
0.6000
0.5000L
0.5000L R
0.5000L
```

La ppm

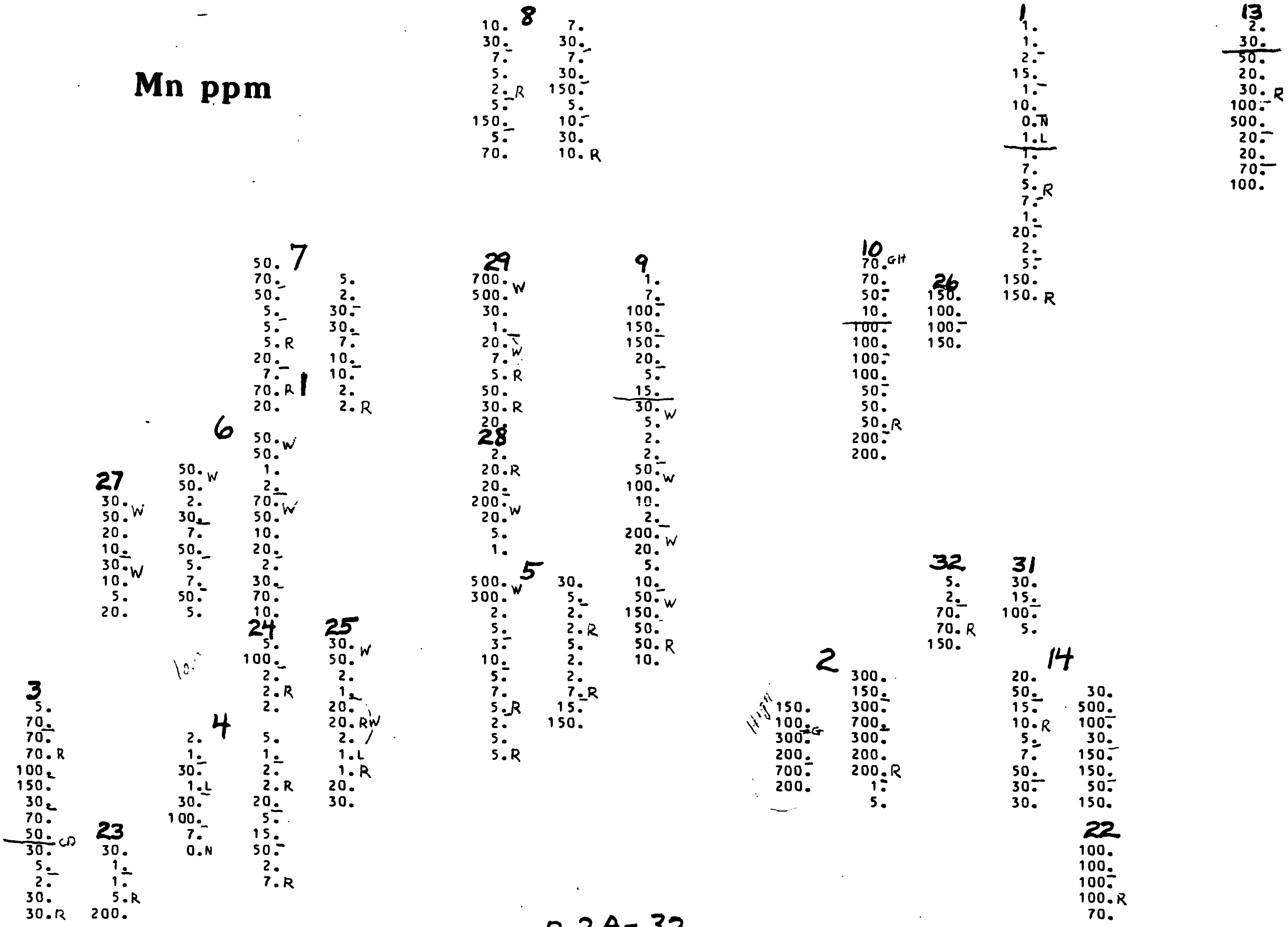

8
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
1
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
50.0000
50.0000 R
0.0000N
0.0000N
0.0000N
0.0000N
50.0000
0.0000N
0.0000NR
13
0.0000N
0.0000N
50.0000L
50.0000
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
7
0.0000N
0.0000N 0.0000N
0.0000N50.0000 ←
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
29
0.0000NW
0.0000NW
0.0000N
0.0000N
0.0000N
0.0000NW
0.0000NR
0.0000N
0.0000NR
0.0000N
28
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000NW
0.0000N
0.0000N
9
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NW
0.0000N
0.0000N
50.0000L
50.0000W
0.0000N
0.0000N
0.0000N
0.0000NW
0.0000N
0.0000N
0.0000NW
50.0000L
0.0000N
0.0000NR
0.0000N
10
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
26
0.0000N
0.0000N
0.0000N
0.0000N
6
0.0000NW
0.0000NW
0.0000N 0.0000NW
0.0000N 0.0000NW
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
27
0.0000N
0.0000NW
0.0000N
0.0000N
0.0000NW
0.0000NW
0.0000N
0.0000N
5
0.0000N50.0000L←
0.0000NW 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N
0.0000N
24
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
25
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
4
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N
0.0000N
3
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
23
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
32
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
31
0.0000N
50.0000L ←
0.0000N
0.0000N
2
0.0000N
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
50.0000L
14
0.0000N
0.0000N50.0000L
0.0000N 0.0000N
0.0000NR 0.0000N
0.0000N 0.0000N
50.0000 0.0000N
50.0000L50.0000L
50.0000L50.0000L
0.0000N50.0000
22
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

Li ppm


13
5.L 5.L 5.L 5.L 5.LR 5. 5.L 15. 5. 8. 13.
1
5.L 10. 10. 5.L 5.L 5.L 5. 5. 5.L 5.L 5.LR 16. 5. 9. 5. 5.L 5. 5.LR
8
5.L 10. 5.L 5.L 5.LR 5.L 5.L 5.L 5.L
5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.LR
10 GH
5.L 5.L 10. 12. 5. 5.L 5.L 5.L 10. 10. 6. R 5.L 10.
26
5. 5.L 5.L 5.L
7
5.L 5.L 5.L 5.L 5.L 5.LR 5. 5.L 5.LR 5.L
5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.LR
5.LW 5.LW 5.L 5.L 15. 5.LW 16. 10. 5.L 5.L 5.L 5.L
6
5.LW 5.LW 5.L 5.L 5.L 5.L 5.L 5.L 5.L
27
5.L 5.LW 5.L 5.L 10. 15. W 5.L 5.L
29
5.LW 5.LW 5.L 5.L 5.LW 5.L 5.LR 5.L 5.L 5.L
28
5.L 5.LR 5.L 5. 5.LW 5. 5.L
9
5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.LW 5.LW 5.L 5.L 5.LW 5.LW 5.L 5.L 5.LW 5.LW 5.L 5.L 5.LW 5.L 5.L 5.LR 5.L
5
5.LW 5.LW 5.L 5.L 5.L 5.L 5.L 5.LR 5.L 5.L 5.LR
5.L 5.L 5.L 5.LR 5.L 50. 46. 45. R 28. 40.
24
5.L 5.L 5.L 5.L 5.L
25
5.LW 5.LW 5.L 5.L 5.L 5.LRW 5.L 5.L 5.LR 5.L 5.LR
4
5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.L
5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.L
3
5.L 5.L 5.L 5.LR 5.L 5.L 5.L 5.L 5.L CD 6. 5.L 5.L 5.L 5.LR
23
5.L 5.L 5.L 5.LR 5.L
2
5.L 50. 5.L 5.L 5.L
5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.L 12.
32
5. 5. 5. 5. R 5.L
31
5.L 5.L 126. 28.
14
8. 5.L 6. 5. 5.L 5.L 5.L 5.L 5.L
10. 5.L 5.L 5. 7. 10. 15. 5.
22
5.L 5.L 5.L 5.L 5.L

p. 2A-31

Mn ppm


8
10.
30.
7.
5.
2. R
5.
150.
5.
70.
7.
30.
7.
30.
150.
5.
10.
30.
10. R
1
1.
1.
2.
15.
1.
10.
0. N
1. L
1.
7.
5. R
7.
1.
20.
2.
5.
150.
150. R
13
2.
30.
50.
20.
30. R
100.
500.
20.
20.
70.
100.
7
50.
70.
50.
5.
5.
5. R
20.
7.
70. R
20.
5.
2.
30.
30.
7.
10.
10.
2.
2. R
29
700.
500. W
30.
1.
20. W
7.
5. R
50.
30. R
20.
28
2.
20. R
20.
200. W
20.
5.
1.
9
1.
7.
100.
150.
150.
20.
5.
15.
30. W
5.
2.
2.
50. W
100.
10.
2.
200. W
20.
5.
10.
50. W
150.
50.
50. R
10.
10
70. GH
70.
50.
10.
100.
100.
100.
100.
50.
50.
50. R
200.
200.
26
150.
100.
100.
150.
6
50. W
50.
2.
30.
7.
50.
5.
7.
50.
5.
50. W
50.
1.
2.
70. W
50.
10.
20.
2.
30.
70.
10.
27
30. W
50. W
20.
10.
30. W
10.
5.
20.
24
5.
100.
2.
2. R
2.
5.
1.
2.
2. R
20.
5.
15.
50.
2.
7. R
25
30. W
50.
2.
1.
20.
20. RW
2.
1. L
1. R
20.
30.
4
2.
1.
30.
1. L
30.
100.
7.
0. N
3
5.
70.
70.
70. R
100.
150.
30.
70.
50. CD
30.
5.
2.
30.
30. R
23
30.
1.
1.
5. R
200.
5
500. W
300. W
2.
5.
3.
10.
5.
7.
5. R
2.
5.
5. R
30.
5.
2.
2. R
5.
2.
2.
7. R
15.
150.
32
5.
2.
70.
70. R
150.
31
30.
15.
100.
5.
2
High
150.
100. G
300.
200.
700.
200.
300.
150.
300.
700.
300.
200.
200. R
1.
5.
14
20.
50.
15.
10. R
5.
7.
50.
30.
30.
30.
500.
100.
30.
150.
150.
50.
150.
22
100.
100.
100.
100. R
70.

Mo ppm

```
                                          0.0000N 0.0000N                                   0.0000N           0.0000N
                                          0.0000N 0.0000N                                   0.0000N           0.0000N
                                          0.0000N 0.0000N                                   0.0000N           0.0000N
                                          0.0000N 0.0000N                                   0.0000N           0.0000N
                                          0.0000N 0.0000N                                   0.0000N           0.0000N
                                          0.0000N 0.0000N                                   0.0000N           0.0000N
                                          0.0000N 0.0000N                                   0.0000N           0.0000N
                                          0.0000N 0.0000N                                   0.0000N           0.0000N
                                          0.0000N 0.0000N                                   0.0000N           0.0000N
                                                                                            0.0000N           0.0000N
                                                                                            0.0000N           0.0000N
                                                                                            0.0000N
                                                                                            0.0000N
                                                                                            0.0000N
                                                                            10              0.0000N
                        0.0000N           29                                0.0000N         0.0000N
                        0.0000N 0.0000N   0.0000N ←       0.0000N           0.0000N 26      0.0000N
                        0.0000N 0.0000N   5.0000 ←        0.0000N         → 5.0000  0.0000N 0.0000N
                        0.0000N 0.0000N   0.0000N         0.0000N           0.0000N 0.0000N
                        0.0000N 0.0000N   0.0000N         0.0000N           0.0000N 0.0000N
                        0.0000N 0.0000N   0.0000N         0.0000N           0.0000N 5.0000 ←
                        0.0000N 0.0000N   0.0000N         0.0000N           0.0000N
                        0.0000N 0.0000N   0.0000N         0.0000N           0.0000N
                        0.0000N 0.0000N   0.0000N         0.0000N           0.0000N
                        0.0000N 0.0000N   0.0000N         0.0000N           0.0000N
                                          0.0000N         0.0000N           0.0000N
                        0.0000N                           0.0000N           0.0000N
                        0.0000N           0.0000N         0.0000N           0.0000N
                0.0000N 0.0000N           0.0000N         0.0000N
                0.0000N 0.0000N           0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N           0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N           0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N           0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N           0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N                           0.0000N
        0.0000N 0.0000N 0.0000N           0.0000N 0.0000N 0.0000N                   0.0000N 0.0000N
        0.0000N 0.0000N 0.0000N           0.0000N 0.0000N 0.0000N                   0.0000N 0.0000N
        0.0000N 0.0000N 0.0000N           0.0000N 0.0000N 0.0000N                   0.0000N 0.0000N
                                          0.0000N 0.0000N 0.0000N                   0.0000N 0.0000N
                        0.0000N 0.0000N   0.0000N 0.0000N 0.0000N                   0.0000N
                        0.0000N 0.0000N   0.0000N 0.0000N 0.0000N
                        0.0000N 0.0000N   0.0000N 0.0000N                   0.0000N         0.0000N
                        0.0000N 0.0000N   0.0000N 0.0000N                   0.0000N         0.0000N 0.0000N
0.0000N                 0.0000N 0.0000N   0.0000N 0.0000N           0.0000N 0.0000N         0.0000N 0.0000N
0.0000N                         0.0000N   0.0000N 0.0000N           0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000N   0.0000N                   0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000N   0.0000N                   0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000N                             0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000N                             0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000N                                     0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                                     22
0.0000N 0.0000N 0.0000N 0.0000N                                                                     0.0000N
0.0000N 0.0000N         0.0000N                                                                     0.0000N
0.0000N 0.0000N         0.0000N                                                                     0.0000N
0.0000N 0.0000N                                                                                     5.0000R ←
0.0000N 0.0000N                                                                                     0.0000N
```

p. 2A-33

Nb ppm

```
         8
0.0000N 0.0000N
10.0000L 0.0000N
10.0000  0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
```

```
       1                              13
 10.0000L                          0.0000N
 10.0000L                          0.0000N
 10.0000L                         10.0000
 10.0000L                         10.0000L
High  0.0000N                      0.0000NR
 10.0000L                         10.0000L
 10.0000                          10.0000
  0.0000N                         10.0000
  0.0000N                          0.0000N
  0.0000N                         10.0000
  0.0000N                          0.0000N
  0.0000N
  0.0000N
  0.0000N
  0.0000N
  0.0000N
  0.0000N
  0.0000N
```

```
    10
 0.0000N
 0.0000N     26
 0.0000N  0.0000N
10.0000   0.0000N
 0.0000N  0.0000N
 0.0000N  0.0000N
 0.0000N
 0.0000N
 0.0000N
 0.0000N
 0.0000N
 0.0000N
 0.0000N
 0.0000N
```

```
                                7
                              0.0000N
                              0.0000N10.0000L
                              0.0000N 0.0000N
                              0.0000N 0.0000N
                              0.0000N 0.0000N
                              0.0000NR0.0000N
                              0.0000N 0.0000N
                              0.0000N 0.0000N
                              0.0000NR0.0000N
                              0.0000N 0.0000NR
                             6
                              0.0000NW
                              0.0000NW
                    0.0000NW  0.0000N
          27        0.0000NW  0.0000N
          0.0000N10.0000L     0.0000N
          0.0000NW 0.0000N    0.0000NW
          0.0000N  0.0000N    0.0000N
          0.0000N  0.0000N    0.0000N
          0.0000NW 0.0000N    0.0000N
          0.0000N 10.0000     0.0000N
          0.0000N  0.0000N    0.0000N
          0.0000N  0.0000N    0.0000N
                              24        25
                              0.0000N 0.0000NW
                              0.0000N 0.0000N
                              0.0000N 0.0000N
   3                          0.0000N10.0000
0.0000N                       0.0000N 0.0000N
0.0000N                      4        0.0000NRW
0.0000N             10.0000L  0.0000N 0.0000N
0.0000NR             0.0000N  0.0000N 0.0000N
0.0000N              0.0000N  0.0000N 0.0000N
10.0000L             0.0000N10.0000LR0.0000N
0.0000N              0.0000N  0.0000N 0.0000N
0.0000N              0.0000N  0.0000N
0.0000N     23       0.0000N  0.0000N
0.0000N  0.0000N     0.0000N  0.0000N
0.0000N  0.0000N              0.0000N
0.0000N  0.0000N              0.0000NR
0.0000N  0.0000N
0.0000NR 0.0000N
```

```
   29                   9
0.0000N              0.0000N
0.0000NW             0.0000N
0.0000N              0.0000N
0.0000N              0.0000N
0.0000N              0.0000N
0.0000NW             0.0000N
0.0000NR             0.0000N
0.0000N              0.0000N
0.0000NR             0.0000NW
0.0000N              0.0000N
   28                0.0000N
0.0000N              0.0000N
0.0000NR             0.0000NW
0.0000N             10.0000
0.0000N              0.0000N
0.0000NW             0.0000N
0.0000N              0.0000NW
0.0000N              0.0000N
            5        0.0000N
0.0000N  0.0000N     0.0000N
0.0000NW 0.0000N     0.0000NW
0.0000N  0.0000N     0.0000N
0.0000N  0.0000NR    0.0000N
0.0000N  0.0000N10.0000LR
0.0000N  0.0000N10.0000L
0.0000N  0.0000N
0.0000N  0.0000NR
0.0000NR 0.0000N
0.0000N  0.0000N
10.0000
0.0000NR
```

```
               32       31
            0.0000N  0.0000N
            0.0000N  0.0000N
            0.0000N  0.0000N
            0.0000N  0.0000N
            0.0000N
      2                              14
          0.0000N             10.0000
          0.0000N              0.0000N10.0000
0.0000N   0.0000N              0.0000N 0.0000N
0.0000N   0.0000N         High 0.0000NR0.0000N
0.0000N   0.0000N              0.0000N 0.0000N
0.0000N   0.0000N              0.0000N 0.0000N
0.0000N   0.0000N              0.0000N 0.0000N
0.0000N   0.0000N             10.0000L20.0000   High
          0.0000N              0.0000N20.0000
                                          22
                                       0.0000N
                                       0.0000N
                                       0.0000N
                                       0.0000N
                                       0.0000N
```

p. 2A-34

Nd ppm

```
                                                                      8                                                     1                             13
                                                            0.0000B   0.0000B                                               0.0000B                       0.0000B
                                                            0.0000B   0.0000B                                               0.0000B                       0.0000B
                                                            0.0000B   0.0000B                                               0.0000B                       0.0000N
                                                            0.0000B   0.0000B                                               0.0000B                       0.0000N
                                                            0.0000B   0.0000B                                               0.0000B                       0.0000B
                                                            0.0000B   0.0000B                                               0.0000B                       0.0000B
                                                            0.0000B   0.0000B                                               0.0000B                       0.0000B
                                                            0.0000B   0.0000B                                               0.0000B                       0.0000B
                                                            0.0000B   0.0000B                                               0.0000B                       0.0000B
                                                                                                                            0.0000N                       0.0000B
                                                                                                                            0.0000N                       0.0000B
                                                                                                                            0.0000B
                                                                                                                            0.0000B
                                                                                                                            0.0000B
                                                                                                              10            0.0000B
                              0.0000B   7                   29                  9                             0.0000B       0.0000N
                              0.0000B   0.0000B             0.0000B             0.0000B                       0.0000B   26  0.0000B
                              0.0000B   0.0000N             0.0000B             0.0000B                       0.0000B   0.0000B   0.0000B
                              0.0000B   0.0000B             0.0000B             0.0000B                       0.0000B   0.0000B
                              0.0000B   0.0000B             0.0000B             0.0000B                       0.0000B   0.0000B
                              0.0000B   0.0000B             0.0000B             0.0000B                       0.0000B   0.0000B
                              0.0000B   0.0000B             0.0000B             0.0000B                       0.0000B
                              0.0000B   0.0000B             0.0000B             0.0000B                       0.0000B
                              0.0000B   0.0000B             0.0000B             0.0000B                       0.0000B
                              0.0000B   0.0000B             0.0000B             0.0000B                       0.0000B
                              6                             0.0000B             0.0000B                       0.0000B
                              0.0000B                       28                  0.0000B                       0.0000B
                              0.0000B                       0.0000B             0.0000B                       0.0000B
                    0.0000B   0.0000B                       0.0000B             0.0000N
          27        0.0000B   0.0000B                       0.0000B             0.0000N
          0.0000B   0.0000B   0.0000B                       0.0000B             0.0000B
          0.0000B   0.0000B   0.0000B                       0.0000B             0.0000B
          0.0000B   0.0000B   0.0000B                       0.0000B             0.0000B
          0.0000B   0.0000B   0.0000B                       0.0000B             0.0000B
          0.0000B   0.0000B   0.0000B                                 5         0.0000B                                 32        31
          0.0000B   0.0000B   0.0000B                       0.0000B   0.0000N   0.0000B                                 0.0000B   0.0000B
          0.0000B   0.0000B   0.0000B                       0.0000B   0.0000B   0.0000Bw                                0.0000B70.0000L ←
          0.0000B   0.0000B   0.0000B                       0.0000B   0.0000B70.0000 ←                                  0.0000B   0.0000B
                              24        25                  0.0000B   0.0000B   0.0000B                                 0.0000BR0.0000B
                              0.0000B   0.0000B             0.0000B   0.0000B   0.0000BR                                0.0000B
                              0.0000B   0.0000B             0.0000B   0.0000B   0.0000B                       2
                              0.0000B   0.0000B             0.0000B   0.0000B                                 0.0000B             0.0000B   14
3                             0.0000B   0.0000B             0.0000B   0.0000B                                 0.0000B             0.0000B   0.0000N
0.0000B                       0.0000B   0.0000B             0.0000B   0.0000B                       0.0000B   0.0000B             0.0000B   0.0000B
0.0000B                       4         0.0000B             0.0000B   0.0000B                       0.0000B   0.0000B             0.0000B   0.0000B
0.0000B             0.0000B   0.0000B   0.0000B             0.0000B                                 0.0000B   0.0000B             0.0000B   0.0000B
0.0000B             0.0000B   0.0000B   0.0000B             0.0000B                                 0.0000B   0.0000B            →70.0000L  0.0000B
0.0000B             0.0000B   0.0000B   0.0000B                                                     0.0000B   0.0000B             0.0000N70.0000 ←
0.0000B             0.0000B   0.0000B   0.0000B                                                     0.0000B   0.0000B             0.0000N   0.0000N
0.0000B             0.0000B   0.0000B   0.0000B                                                               0.0000N             0.0000B   0.0000N
0.0000B             0.0000B   0.0000B
0.0000B   23        0.0000B   0.0000B                                                                                                       22
0.0000B   0.0000B   0.0000B   0.0000B                                                                                                       0.0000B
0.0000B   0.0000B             0.0000B                                                                                                       0.0000B
0.0000B   0.0000B             0.0000B                                                                                                       0.0000B
0.0000B   0.0000B                                                                                                                           0.0000BR
0.0000B   0.0000B                                                                                                                           0.0000B
```

Ni ppm

```
         8
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR5.0000L
0.0000N 0.0000N
5.0000L 0.0000N
5.0000L 0.0000N
5.0000L 0.0000NR
```

```
    1
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
5.0000L
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
5.0000L
0.0000N
5.0000LR
```

```
          13
       0.0000N
       5.0000L
      10.0000
       5.0000
High   5.0000 R
      10.0000
       5.0000
       0.0000N
       7.0000
      10.0000
       5.0000
```

```
0.0000N 7
5.0000  0.0000N
0.0000N 5.0000L
0.0000N 0.0000N
0.0000N 5.0000L
0.0000NR0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000NR
```

```
                  6
                  0.0000N
                  0.0000NW
        0.0000N   0.0000N
 27     0.0000NW  0.0000N
0.0000N 0.0000N   0.0000NW
0.0000NW0.0000N   5.0000
0.0000N 0.0000N   5.0000L
0.0000N 0.0000N   0.0000N
5.0000L 0.0000N   0.0000N
0.0000NW5.0000    0.0000N
5.0000L 0.0000N   0.0000N
5.0000  0.0000N   0.0000N
```

```
           24      25
        0.0000N 0.0000NW
        0.0000N 5.0000L
        0.0000N 0.0000N
        0.0000N 0.0000N
        0.0000N 0.0000N
           4    0.0000NRW
0.0000N 0.0000N 5.0000L
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000NR
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 5.0000LR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000N
        0.0000N
```

```
   3
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N CB  23
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 5.0000L
```

```
   29                    9
0.0000N W            0.0000N
5.0000               0.0000N
0.0000N              5.0000  ←
0.0000N             10.0000
0.0000N              0.0000N
0.0000NW             0.0000N
0.0000NR             0.0000N
5.0000L              5.0000L
5.0000LR             5.0000L
0.0000N              0.0000NW
   28                0.0000N
0.0000N              0.0000N
0.0000NR             5.0000L
0.0000N              5.0000LW
5.0000L              5.0000
0.0000NW             5.0000L
0.0000N             10.0000
0.0000N             10.0000  W←
              5     10.0000
5.0000L  0.0000N     5.0000L
0.0000NW 0.0000N     5.0000LW
5.0000   0.0000N     5.0000L
5.0000L  0.0000NR   10.0000
0.0000N  0.0000N     7.0000 R
0.0000N  5.0000L     7.0000
0.0000N  0.0000N
0.0000N  5.0000LR
0.0000NR 0.0000N
0.0000N  0.0000N
0.0000N
0.0000NR
```

```
          10
      5.0000 GH
      5.0000          26
      5.0000L   0.0000N
      0.0000N   5.0000
      0.0000N   0.0000N
High  0.0000N   5.0000
      0.0000N
      5.0000L
      5.0000L
      0.0000N
      5.0000LR
     10.0000
      5.0000L
```

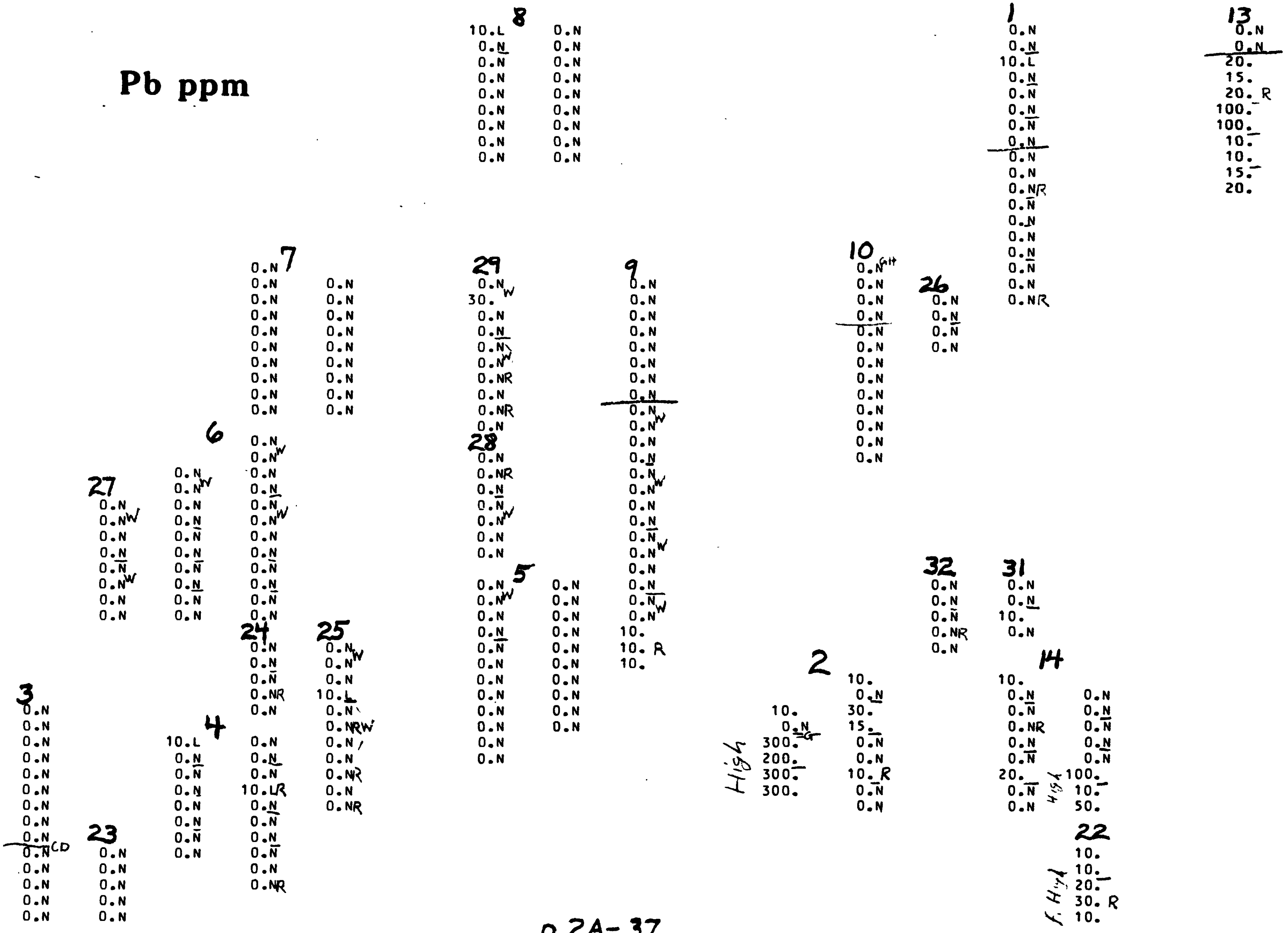
```
  32      31
0.0000N 0.0000N
0.0000N 5.0000L
5.0000L 0.0000N
0.0000NR0.0000N
0.0000N
```

```
            2
        0.0000N
        0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
5.0000L 0.0000N
0.0000N 5.0000L
5.0000L 0.0000NR
0.0000N 5.0000L
        5.0000L
```

```
              14
 5.0000
 0.0000N  7.0000
 0.0000N  5.0000L
 0.0000NR10.0000
 0.0000N  0.0000N
 5.0000L  0.0000N
 0.0000N  0.0000N
 5.0000L 10.0000
10.0000   0.0000N
```

```
     22
 5.0000L
 5.0000
 5.0000
10.0000 R
 5.0000L
```

Pb ppm


8
10.L
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
1
0.N
0.N
10.L
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
0.N
0.N
0.NR
13
0.N
0.N
20.
15.
20. R
100.
100.
10.
10.
15.
20.
7
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
6
0.N
0.NW
0.N
0.N
0.N
0.NW
0.N
0.N
0.N
0.N
0.N
0.N
29
0.NW
30.
0.N
0.N
0.N
0.NW
0.NR
0.N
0.NR
0.N
28
0.N
0.NR
0.N
0.N
0.NW
0.N
0.N
9
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.NW
0.N
0.N
0.N
0.NW
0.N
0.N
0.N
0.NW
0.N
0.N
0.N
0.NW
10.
10. R
10.
10
0.N GH
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
26
0.N
0.N
0.N
0.N
27
0.N
0.NW
0.N
0.N
0.N
0.NW
0.N
0.N
0.N
0.NW
0.N
0.N
0.N
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0.N
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0.N
0.N
5
0.N
0.NW
0.N
0.N
0.N
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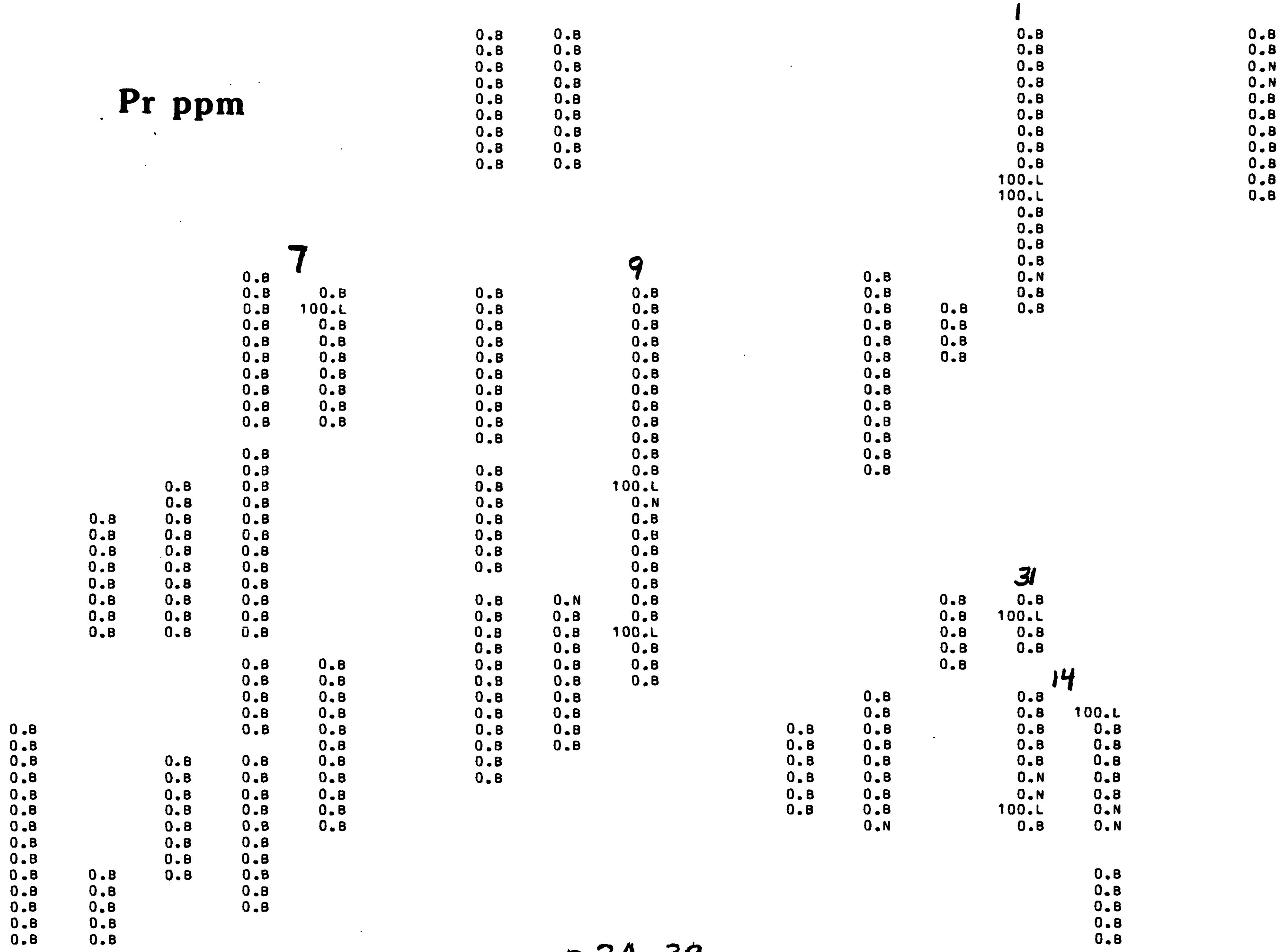
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
24
0.N
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
10.LR
0.N
0.N
0.N
0.N
0.N
0.NR
25
0.NW
0.NW
0.N
10.L
0.N
0.NRW
0.N
0.N
0.NR
0.N
0.NR
4
10.L
0.N
0.N
0.N
0.N
0.N
0.N
0.N
3
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N CD
0.N
0.N
0.N
0.N
23
0.N
0.N
0.N
0.N
0.N
32
0.N
0.N
0.N
0.NR
0.N
31
0.N
0.N
10.
0.N
2
10.
0.N G
300.
200.
300.
300.
High
10.
0.N
30.
15.
0.N
0.N
10. R
0.N
0.N
14
10.
0.N
0.N
0.NR
0.N
0.N
20.
0.N
0.N
0.N
0.N
0.N
0.N
0.N
100.
10.
50.
High
22
10.
10.
20.
30. R
10.
f. High

p. 2A-37

Pr ppm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0.B
0.B
0.B
0.B
7
0.B
100.L
0.B
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0.B
0.N
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0.B
0.B
9
0.B
0.B
0.B
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0.B
0.B
0.B
0.B
0.B
0.B
100.L
0.N
0.B
0.B
0.B
0.B
0.B
0.B
0.B
100.L
0.B
0.B
0.B
0.B
0.B
0.B
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0.B
0.B
0.N
0.B
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0.B
0.B
0.B
0.B
0.B
0.B
1
0.B
0.B
0.B
0.B
0.B
0.B
0.B
0.B
0.B
100.L
100.L
0.B
0.B
0.B
0.B
0.N
0.B
0.B
31
0.B
100.L
0.B
0.B
14
0.B
0.B
0.B
0.B
0.B
0.N
0.N
100.L
0.B
100.L
0.B
0.B
0.B
0.B
0.B
0.N
0.N
0.B
0.B
0.B
0.B
0.B
0.B
0.B
0.N
0.N
0.B
0.B
0.B
0.B
0.B
0.B
0.B

p. 2A-38

Rb ppm

```
            8
5.0000L  5.0000L
50.0000  5.0000L
5.0000L 10.0000
5.0000L  6.0000
5.0000LR 5.0000L
5.0000L  5.0000L
5.0000L  5.0000
9.0000   5.0000L
8.0000   5.0000LR
```

```
    1
 5.0000L
 5.0000L
 5.0000
 5.0000L
 9.0000
10.0000
 5.0000L
 5.0000L
11.0000
10.0000
10.0000R
 5.0000L
 5.0000L
 6.0000
 5.0000L
15.0000
 5.0000L
10.0000R
```

```
   13
 5.0000
 6.0000
80.0000
60.0000
85.0000R
78.0000
35.0000
90.0000
30.0000
70.0000
40.0000
```

```
            7
5.0000L
5.0000L  5.0000
5.0000L  5.0000L
5.0000L  5.0000L
5.0000L  6.0000
5.0000LR 14.0000
5.0000   5.0000L
5.0000L  5.0000
5.0000LR 5.0000L
5.0000L  5.0000LR
```

```
                          6
                          6.0000
                          5.0000L W
                 5.0000   5.0000L
       27        5.0000L W 5.0000L
5.0000           6.0000   5.0000L W
5.0000L W        5.0000L  8.0000
5.0000L          5.0000L  5.0000
5.0000L          5.0000L  5.0000
6.0000 W         5.0000   5.0000L
8.0000           5.0000L  5.0000L
5.0000           8.0000   8.0000
5.0000L          5.0000L  5.0000L
```

```
   24          25
5.0000      5.0000 W
5.0000L    11.0000
5.0000L     5.0000L
5.0000R     5.0000L
5.0000L     5.0000L
            5.0000LRW
   4
5.0000     10.0000
5.0000L     5.0000L
5.0000L     5.0000L
5.0000LR    5.0000L
5.0000L     5.0000L
5.0000L
5.0000L
5.0000L
5.0000
5.0000R
```

```
              5.0000L
              5.0000L
              5.0000L
              5.0000L
              8.0000
              5.0000L
              5.0000
              5.0000L
```

```
   3
5.0000L
5.0000L
8.0000
5.0000LR
5.0000L
5.0000
5.0000L
5.0000L
5.0000L        23
5.0000L CD 5.0000L
5.0000L    6.0000
5.0000L    5.0000L
5.0000L    8.0000R
5.0000R    5.0000L
```

```
   29
10.0000 W
 5.0000L
 8.0000
 5.0000L
 5.0000L W
 6.0000
 8.0000R
 9.0000
 8.0000R
 5.0000L
   28
 5.0000L
 8.0000R
 6.0000
10.0000 W
 5.0000L
10.0000
 5.0000L
```

```
    9
 5.0000
 5.0000L
 8.0000
 8.0000
 5.0000L
 6.0000
 5.0000L
 8.0000
28.0000 W
 6.0000
 5.0000L
 5.0000L
28.0000 W
25.0000
25.0000
18.0000
70.0000 W
63.0000
16.0000
```

```
               5
 6.0000 W   5.0000L   9.0000
 5.0000     5.0000   60.0000 W
 5.0000L    5.0000L  14.0000
10.0000     5.0000R  53.0000
 5.0000L    5.0000L  63.0000R
 8.0000     6.0000   46.0000
 6.0000     5.0000L
 8.0000     5.0000LR
 5.0000LR   5.0000L
 5.0000L    5.0000L
 5.0000L
 5.0000R
```

```
   10
 6.0000 GH
11.0000       26
18.0000    21.0000
10.0000    15.0000
16.0000    18.0000
13.0000     9.0000
 8.0000
13.0000
13.0000
 9.0000
 5.0000R
 9.0000
38.0000
```

```
   32        31
13.0000    8.0000
20.0000   24.0000
15.0000   29.0000
13.0000R   5.0000L
 5.0000L
```

```
             2
            9.0000
            8.0000
5.0000L     9.0000
5.0000L     5.0000L
5.0000L     5.0000L
5.0000L     5.0000L
5.0000L    10.0000R
5.0000L    16.0000
           22.0000
```

```
             14
20.0000
14.0000   70.0000
20.0000   14.0000
15.0000R   9.0000
14.0000   14.0000
31.0000   13.0000
25.0000   25.0000
44.0000   40.0000
25.0000   40.0000
```

```
   22
10.0000
 9.0000
10.0000
14.0000R
 6.0000
```

p. 2A-39

Sb ppm

```
        8
3.8860  1.0000L
4.8130  1.0000L
1.0000L 1.0000L
1.2400  1.0000L
1.2050 R1.0000L
1.3400  1.0000L
1.0000L 1.0000L
1.2170  1.2290
1.0000L 1.0000LR
```

```
1
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000LR
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000LR
```

```
13
1.0000L
1.0000L
1.0000L
1.0000L
1.0000LR
1.0000L
1.0660
1.0000L
1.0000L
1.0000L
1.0000L
```

```
        7
1.0000L
12.8200  1.0000L
1.0000L  1.0000L
1.8790   1.0000L
1.2780   1.0000L
3.0880 R 1.0000L
2.3390   1.0000L
1.0680   1.0000L
1.0000LR 1.0000L
2.6130   1.0000LR
```

```
29
1.0000L W
1.0000L
1.0000L
1.0000L
1.0000L W
1.0000L W
1.0000LR
1.0000L
1.0000LR
1.0000L
28
1.0000L
1.0000LR
1.0000L
1.0000L W
3.0630
1.7560
1.0000L
```

```
9
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L W
1.0000L
1.0000L
1.0000L
1.0000L W
1.0000L
1.0000L
1.0000L
1.0000L W
1.0000L
1.0000L
1.0000L
1.0000L W
1.0000L
1.0000L
1.0000LR
1.0000L
```

```
          5
1.0000L W 1.0000L
1.0000L   1.0000L
1.0000L   1.0000L
1.0000L   1.0000LR
1.0000L   1.0000L
1.0000L   4.2400
1.0000L   3.7220
1.0000L   6.5470 R
1.0000LR  3.0190
1.0000L   6.5520
1.0000L
1.0000LR
```

```
10
1.0000L Gil
1.0000L   26
1.0000L   1.0000L
1.0000L   1.0000L
1.0000L   1.0000L
1.0000L   1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000LR
1.0000L
1.0000L
```

```
                             6
                             1.0000L W
                             1.0000L
        27         1.0000L W 1.0000L
                   1.0000L   1.0000L
1.0000L W          1.0000L   1.7260 W
1.0000L W          1.0000L   1.0000L
1.2550             1.0000L   1.6600
1.0000L            1.0000L   1.6460
1.0000L W          1.0000L   1.0000L
4.0130             1.0000L   1.4590
1.0000L            1.0000L   1.0000L
1.0720             1.0000L   3.0250
```

```
        24       25
        1.0000L  1.0000L W
        1.0000L  1.0000L
        1.0000L  1.0000L
        1.0000LR 1.0000L
        1.0000L  1.0000L
                 1.0000LR W
        4
1.0000L 1.0000L  1.0000L
1.0000L 1.0000L  1.0000L
1.0000L 1.1640   1.0000LR
1.0000L 1.0000LR 1.0000L
1.0000L 1.0000L  1.0000LR
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
        1.0000L
        1.0000LR
```

```
3
1.0000L
1.0000L
1.0000L
1.6040 R
1.0000L
1.0000L
1.0000L
1.0000L
         23
1.0000L  1.0000L
1.6220   1.0000L
1.0000L  1.0000L
1.5340   1.0000LR
1.0000LR 1.4990
```

```
32       31
1.0000L  1.0000L
1.0000L  1.0000L
1.0000L  4.8130
1.0000LR 1.0000L
1.0000L
```

```
        2
        1.0000L
        1.0000L
2.9270  1.0000L
2.0480  1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000LR
1.0000L 1.0000L
        1.3660
```

```
         14
1.3240
1.0000L  1.0000L
1.0000L  1.0000L
1.6340 R 1.0490
1.0000L  1.0000L
1.0000L  1.0000L
1.0000L  1.0000L
1.0000L  1.0000L
1.0000L  1.0000L
```

```
22
1.0000L
1.0000L
1.4380
1.0000LR
1.0000L
```

Sc ppm

```
8
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

```
1
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
13
0.0000N
0.0000N
5.0000
5.0000
5.0000LR
5.0000L
0.0000N
5.0000
0.0000N
5.0000L
5.0000L
```

```
7
0.0000N
0.0000N 0.0000N
0.0000N 5.0000
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

```
29
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000NR
0.0000N
0.0000NR
0.0000N
```

```
28
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N
```

```
9
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N
5.0000L W
7.0000
0.0000N
0.0000N
5.0000
5.0000L W
0.0000N
0.0000N
5.0000L W
0.0000N
0.0000N
0.0000NR
5.0000L
```

```
10
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
26
0.0000N
0.0000N
0.0000N
0.0000N
```

```
6
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
27
        0.0000N
        0.0000N W
0.0000N 5.0000L
0.0000N W 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N W 0.0000L
0.0000N 0.0000N
0.0000N 0.0000N
```

```
5
0.0000N 5.0000L
0.0000N W 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N
0.0000N
```

```
32
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
31
0.0000N
0.0000N
0.0000N
0.0000N
```

```
25
0.0000N 0.0000N
0.0000N 0.0000N W
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000NRW
        0.0000N
        0.0000N
        0.0000NR
        0.0000N
        0.0000NR
```

```
2
        0.0000N
        0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000N
```

```
14
0.0000N
0.0000N 5.0000
0.0000N 0.0000N
0.0000NR 0.0000N
0.0000N 0.0000N
5.0000L 0.0000N
5.0000 5.0000
5.0000L 5.0000
0.0000N 5.0000
```

```
3
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
4
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000N
        0.0000N
```

```
23
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
22
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
```

p. 2A-41

Se ppm

8

0.1977
0.1000L
0.1000L
0.1000L
0.2006R
0.1000L
0.2773
0.1000L
0.1000L

0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1462
0.1000L
0.1000L
0.1000LR

1

0.2541
0.2397
0.3065
0.1000L
0.1000L
0.1000L
0.1000L
0.2722
0.1419
0.2497
0.2163R
0.1000L
0.1000L
0.4048
0.1000L
0.5281
0.1233
0.4251R

13

0.1266
0.1000L
0.1550
0.3106
0.2615R
0.1247
0.4077
0.1038
0.2498
0.1325
0.2628

7

0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.2405R
0.2474
0.2797
0.1286R
0.1625

0.1000L
0.1474
0.1000L
0.1000L
0.4329
0.1000L
0.1732
0.1000L
0.1083R

29

0.1000LW
0.2434
0.1000L
0.1674
0.1000L
0.1000LW
0.1000LR
0.2408
0.1529R
0.1197

28

0.1000L
0.1338R
0.1000L
0.1000L
0.4275W
0.1000L
0.1000L

9

0.1000L
0.1760
0.1088
0.2132
0.1000L
0.1000L
0.1000L
0.1381
0.1000LW
0.2781
0.1187
0.3638
0.1974W
0.3920
0.1957
0.1000L
0.2879W
0.1773
0.1137
0.2325
0.1900W
0.1348
0.2605
0.1060R
0.2314

10 GH

0.2072
0.1951
0.1387
0.1000L
0.1000L
0.2452
0.3697
0.2646
0.2000
0.1000L
0.1000LR
0.4863
0.1000L

26

0.3340
0.3038
0.2190
0.2189

6

0.1087W
0.1769W
0.1000L
0.1000L
0.1979W
0.2909W
0.3198
0.2672
0.1648
0.1000L
0.1000L
0.1000L

27

0.2595W
0.2322
0.1000L
0.1000L
0.1000LW
0.1940
0.1000L
0.1000L

0.1000LW
0.1000L
0.3215
0.1278
0.1000L
0.1347
0.1256
0.1235
0.1000L
0.1332

5

0.4196W
0.1913
0.1000L
0.2691
0.1000L
0.2194
0.1000L
0.1000L
0.1000LR
0.1000L
0.1870
0.1865R

0.1000L
0.1000L
0.1214
0.1000LR
0.1000L
0.3867
0.1000L
0.1000LR
0.3331
0.1000L

32

0.1733
0.1000L
0.1000L
0.1147R
0.1508

31

0.2812
0.8784 ←
0.3539
0.1000L

24

0.1660
0.1000L
0.2067
0.2030R
0.1398

25

0.1000LW
0.1319
0.1000L
0.2668
0.3478
0.1000LRW
0.1017
0.1000L
0.1000LR
0.1000L
0.2868R

2

0.1256
0.1000L
0.2267
0.1572
0.1000L
0.1427

0.1000L
0.1667
0.1125
0.1000L
0.1678
0.2219
0.1000LR
0.1928
0.1767

14

0.2291
0.1276
0.1000L
0.1000LR
0.1000L
0.1125
0.1024
0.2155
0.1581

0.4079
0.1919
0.2015
0.3776
0.1000L
0.1000L
0.1978
0.4262

3

0.1937
0.1000L
0.1000L
0.1433R
0.1000L
0.1000L
0.1482
0.1000L
→ 0.4939 <D
0.1644
→ 0.8496
0.1000L
0.1000L
0.1000LR

23

0.3148
0.1000L
0.1000L
0.1415R
0.1000L

4

0.1042
0.4923
0.2288
0.1000L
0.1000L
0.1000L
0.2528
0.2338

0.1117
0.1000L
0.1000L
0.2419R
0.1000L
0.1000L
0.1386
0.1000L
0.1637
0.1000LR

22

0.1000L
0.1656
0.1023
0.2772R
0.1000L

p. 2A-42

Sn ppm

```
     8
0.2676  0.1000L
0.4918  0.5549
0.1000L 0.1000L
0.1563  0.1816
1.5020R 0.2503
0.5101  0.2928
0.4185  0.1000L
0.1604  0.8472
0.1000L 0.1000LR
```

```
   1
0.1000L
0.1635
0.1000L
0.1000L
0.6783
0.1804
0.1000L
0.1000L
0.1000L
0.3127
0.1000LR
0.3671
0.2010
0.1000L
0.1245
0.1044
0.1000L
0.1000LR
```

```
   13
0.1000L
0.1000L
0.3755
0.3621
0.2992R
0.1000L
0.1000L
0.1888
0.1000L
0.2997
0.4677
```

```
        7
0.1000L
0.4990  0.2033
0.2056  0.1000L
0.1000L 0.1978
0.1000L 0.1000L
0.8889R 0.1048
0.8831  0.1000L
0.1275  0.4800
0.4799R 0.1308
0.2205  0.3081R
```

```
                  6
                  0.8782W
                  0.1000L
  27     0.1000L  0.2609
         0.5027W  0.1000L
0.1627W  0.1000L  0.1000LW
0.1000L  0.1000L  0.1000L
2.0360   0.7555   0.1883
0.1000L  0.1000L  0.1573
0.1000LW 0.5111   0.1000L
0.1000L  0.1000L  0.6994
0.1652   0.1000L  0.5980
0.1000L  0.1000L  0.6638
```

```
            24       25
         0.1000L  0.1000LW
         0.1000L  0.1119
         0.2349   0.4917
         0.1000LR 0.1000L
         0.1000L  0.1000L
      4           0.1000LRW
0.1000L  0.1000L  0.4435/
0.1000L  0.1000L  0.1000L
0.1000L  0.1354   0.9242R
0.1000L  0.1000LR 5.3160 ←
0.1000L  0.5183   0.1838R
0.1000L  0.1000L
0.1000L  0.1000L
0.1787   0.1000L
        13.3100 ←
         0.1000LR
```

```
   3
0.1000L
0.3758
0.6175
0.4089R
0.1000L
0.1000L
0.2854
0.3470
0.1000L      23
0.1000Lcd 0.1000L
0.1000L   0.3384
0.1641    0.3985
0.3988    1.5220R
0.6462R   0.3910
```

```
   29                 9
0.1000LW           0.1000L
0.1000L            0.2507
0.1000L            0.5793
0.1000L            0.2376
0.4776W            0.5547
0.6618             0.6335
0.1000LR           0.7826
0.1000L            0.1000L
0.3561R            0.1000LW
0.1000L            0.1000L
   28              0.2011
0.3784             0.1988
0.1010R            0.1000LW
0.1000L            0.1000L
0.1000L            0.1000L
0.6153W            0.2638
0.3055             0.1524W
0.3316             0.1583
        5          0.1000L
0.1000L  0.3302    0.1205
0.1129W  0.1000L   0.1000LW
0.4374   0.5881    0.1599
0.1000L  0.1000LR  0.1000L
0.9642   0.1228    0.3205R
0.1438   0.1256    0.2894
0.1000L  0.1251
0.1000L  0.8375R
0.1000LR 0.2307
0.2742   0.1868
0.1000L
0.8953R
```

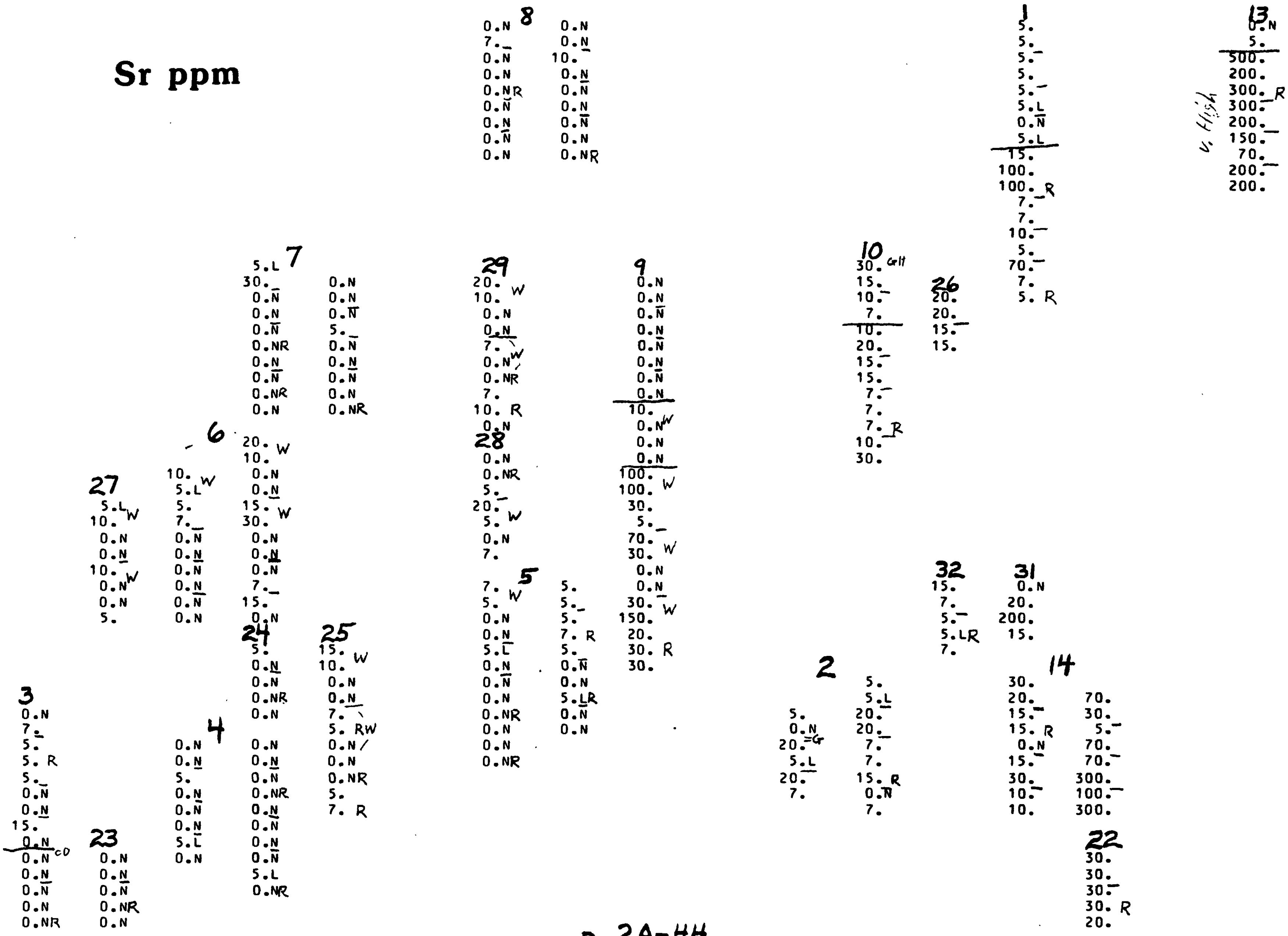
```
   10
0.1000L6H
0.1000L      26
0.1000L  0.8479
0.1000L  0.5911
0.4476   0.4446
1.0540   0.2564
0.6739
0.7524
0.1000L
0.1000L
0.1000LR
0.3429
0.6425
```

```
   32       31
0.1000L  0.2950
0.1000L  0.1000L
0.1000L  0.1000L
0.1000LR 0.1000L
0.2351
```

```
         2
         0.1000L
         0.1020
0.6747   0.4751
0.91233cr 0.4381
0.1000L  0.1000L
0.7697   0.2384
0.1000L  0.2010R
0.3928   0.1000L
         0.6198
```

```
      14
0.1000L
0.2535   0.4153
0.1475   0.1000L
0.5708R  0.1000L
0.1000L  0.3414
0.2634   0.1444
0.1000L  0.1000L
0.6980   0.1928
0.1000L  0.4087
            22
         0.3856
         0.1000L
         0.8127
         0.1036R
         0.5063
```

Sr ppm


8
0.N
7.
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
0.N
0.N
10.
0.N
0.N
0.N
0.N
0.N
0.NR
1
5.
5.
5.
5.
5.
5.L
0.N
5.L
15.
100.
100. R
7.
7.
10.
5.
70.
7.
5. R
13
0.N
5.
500.
200.
300. R
300.
200.
150.
70.
200.
200.
v. high
7
5.L
30.
0.N
0.N
0.N
0.NR
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
5.
0.N
0.N
0.N
0.N
0.NR
6
10. W
5.L W
5.
7.
0.N
0.N
0.N
0.N
0.N
0.N
20. W
10.
0.N
0.N
15. W
30. W
0.N
0.N
0.N
7.
15.
0.N
27
5.L W
10.
0.N
0.N
10. W
0.N W
0.N
5.
29
20. W
10.
0.N
0.N
7.
0.N W
0.NR
7.
10. R
0.N
28
0.N
0.NR
5.
20. W
5. W
0.N
7.
9
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
10.
0.N W
0.N
0.N
100.
100. W
30.
5.
70.
30. W
0.N
0.N
30. W
150.
20.
30. R
30.
10 Grit
30.
15.
10.
7.
10.
20.
15.
15.
7.
7.
7. R
10.
30.
26
20.
20.
15.
15.
5
7. W
5. W
0.N
0.N
5.L
0.N
0.N
0.N
0.NR
0.N
0.N
0.NR
5.
5.
5.
7. R
5.
0.N
0.N
5.LR
0.N
0.N
24
5.
0.N
0.N
0.NR
0.N
25
15.
10. W
0.N
0.N
7.
5. RW
0.N
0.N
0.NR
5.
7. R
4
0.N
0.N
5.
0.N
0.N
0.N
5.L
0.N
0.N
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
5.L
0.NR
3
0.N
7.
5.
5. R
5.
0.N
0.N
15.
0.N
0.N CD
0.N
0.N
0.N
0.NR
23
0.N
0.N
0.N
0.NR
0.N
2
5.
0.N
20. =G
5.L
20.
7.
5.
5.L
20.
20.
7.
7.
15. R
0.N
7.
32
15.
7.
5.
5.LR
7.
31
0.N
20.
200.
15.
14
30.
20.
15.
15. R
0.N
15.
30.
10.
10.
70.
30.
5.
70.
70.
300.
100.
300.
22
30.
30.
30.
30. R
20.

Th ppm

```
          8
1.0000L  1.0000L
5.1400   1.0000L
1.0000L  1.3400
1.0000L  1.0000L
1.0000LR 1.0000L
1.0000L  1.0000L
1.0000L  1.0000L
1.0000L  1.0000L
1.0000L  1.0000LR
```

```
   1
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.5100
1.8500
2.2500
2.2000 R
1.0000L
1.0000L
1.7900
1.0000L
4.7600
3.1800
1.0000LR
```

```
   13
1.0000L
1.0000L
5.9600
5.7800
6.7600 R
8.0800
18.3700
6.2700
5.3500
8.6800
8.9100
```

```
           7
1.0000L
1.4200   1.0000L
1.0000L  1.0000L
1.0000L  1.0000L
1.0000L  1.0000L
1.0000LR 1.0000L
1.0000L  1.0000L
1.2100   1.1000
1.0000LR 1.0000L
1.0000L  1.0000LR
```

```
   29               9
1.0000L W        1.0000L
2.5600           1.4000
1.2100           1.0500
1.0000L          1.0000L
1.0000L W        1.0000L
1.0000L          1.0000L
1.0000LR         1.0000L
1.0000L          1.3500
1.2600 R         2.3500
1.0000L          1.0000L W
   28            1.9700
1.0000L          1.0000L
1.2900 R         8.6200
1.0000L          7.6700 W
1.5200 W         1.6800
1.0000L          2.3200
1.0200           5.6500 W
1.8600           4.2600
            5    1.0000
1.0000L W 1.5900    1.0000L
1.0000L  1.0000L    3.8200 W
1.0000L  1.0000L    6.6800
1.5800   1.0000LR   3.9700
1.0000L  1.0000L    2.9800 R
1.0000L  1.0000L    5.2300
1.2500   1.0000L
1.0000L  1.0000LR
1.0000LR 1.0000L
1.7700   1.0000L
1.8400
1.0000LR
```

```
   10
1.2600 inH
1.1600        26
1.1900    1.6600
1.0000L   1.5000
1.5200    1.0000L
1.1100    1.0000L
1.0000L
1.3200
1.0000L
1.0000L
1.0000LR
1.0000L
1.1400
```

```
                                 6
                                1.0400 W
                                1.0000L
                   1.0000L W    1.0000L
     27            1.0000L      1.0000L
1.0000L W          1.0000L      1.0000L W
1.0000L W          1.0000L      1.5100
1.0000L            1.0000L      1.0000L
1.0000L            1.0700       1.0000L
1.0600 W           1.0000L      1.0000L
1.0000L            1.1400       1.0000L
1.0700             1.0000L      1.0000L
2.9600             1.0000L      1.0000L
                                   24         25
                                1.0000L    1.0000L W
                                1.0000L    1.0000L
                                1.1500     1.0000L
                                1.0000LR   1.0000L
                                1.0000L    1.0000L
                            4              2.2100 RW
                   1.0000L      1.0000L    1.0000L
                   1.0000L      1.0000L    1.0000L
                   1.0000L      1.0000L    1.0000LR
                   1.0000L      1.0000L    1.0000L
                   1.0000L      1.0000L    1.0000LR
                   1.0000L      1.0000L
                   1.0000L      1.0000L
                   1.0000L      1.0000L
                                1.0000L
                                1.0000L
```

```
   3
1.0000L
2.1800
1.0000L
1.0000LR
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L 9     23
1.0100    1.0000L
1.0000L   1.0000L
1.0000L   1.0000L
1.0000L   1.0000LR
1.0000LR  1.0000L
```

```
                32        31
              3.9400    1.0000L
              5.7000    7.7200
              2.3300    1.0800
              2.3200 R  1.0000L
              1.0000L
        2                          14
          1.0000L           13.5800
          1.0000L            1.0000L 13.6400
1.0000L   1.0000L            1.4600   1.0000L
1.0000L   1.0000L            1.7400 R 3.0300
1.0000L   3.5900             1.0000L  1.6200
1.0000L   4.3700             5.5300   1.8400
1.0000L   1.0000LR          10.2200   1.0000L
1.0000L   2.4700             7.4400   7.5800
          3.6000             2.9300   8.0800
                                        22
                                      2.9400
                                      1.0000L
                                      2.1100
                                      3.1700 R
                                      1.0000L
```

U ppm

8

0.2700 0.1600
1.6100 0.2600
0.2100 0.6200
0.1500 0.1000L
0.1800R 0.2400
0.2700 0.2100
0.1800 0.2300
0.1400 0.1700
0.1900 0.2600R

1

0.5400
0.5200
0.5600
0.4000
0.9300
0.8700
0.3400
0.5200
0.5600
1.1000
1.2600R
0.5400
0.5400
0.4400
1.1300
1.0700
0.5800
0.7700R

13

0.1800
0.8400
2.2000
2.5500
2.4500R
1.7300
7.5200
2.2300
0.8500
1.3500
1.6600

7

0.1700
1.4700 0.4100
0.2000 0.2000
0.2300 0.1100
0.1700 0.2200
0.1700R 1.5500
0.4500 0.2100
0.2400 0.5300
0.2600R 0.1300
0.1900 0.2400R

29

1.0100W
0.1000L
1.6400
0.2400
0.2300W
0.2100
0.2600R
0.5500
0.3800R
0.3300

9

0.1700
0.1000L
0.3400
0.3700
0.1200
0.2700
0.1500
0.2100
0.5900W
0.2500
0.2500
0.1900
1.4700W
1.7600
0.5800
0.4200
1.3300W
1.2800
0.7200
0.2900
0.9300W
1.8600
1.3200
1.4300R
1.2500

10

0.4700GH
0.4100
0.7600
0.5500
0.9100
0.7200
0.2500
0.7000
0.9200
1.2500
1.3900R
1.0100
2.5100

26

1.3100
1.0000
1.4600
0.9600

6

0.5400W
0.4800
0.5500W 0.2200
0.1800W 0.1900
2.0700 0.5600W
0.1500 0.9700W
0.1700 0.6700
0.1800 0.2500
0.3900 0.1200
0.1100 0.1700
0.2100 0.1500
0.2300 0.1600

27

1.0000
0.9500W
0.1900
0.2500
1.2100W
1.3800
0.2300
0.3400

28

0.4900
0.5200R
0.8400
0.5300W
0.8700
0.3900
0.2800

5

0.2700W 0.4000
0.1700 0.4300
0.2100 0.4400
0.1500 0.5300R
0.2900 0.4900
0.2100 0.7900
0.5100 1.0300
0.3600 1.0000R
0.4300R 0.4500
0.7800 0.3500
0.2700
0.5000R

32

3.0300
3.8200
3.6200
3.5300R
0.4200

31

0.6000
3.8900
2.4000
0.4500

24

0.1500
0.2100
0.1000L
0.1200R
0.1400

25

0.1800W
0.3600
0.1800
0.1500
0.2400
0.1600RW
0.4800
0.1000
0.1500R
0.1900
0.1400R

2

0.5400
0.5900
0.3200 1.0200
0.2200G 0.4500
1.1000 0.5100
1.2600 0.3900
3.4300 0.9700R
1.1100 0.8900
1.1400

14

5.4000
3.5400 4.1200
3.9200 3.2100
4.0600R 3.2300
2.5700 1.2700
3.5100 1.3700
29.8900 24.6200
1.7700 6.0600
2.3800 5.5100

3

0.2200
0.1000L
0.2600
0.3500R
0.1000
0.3900
0.1000
0.2100
0.1300
0.1300CD
0.1800
0.1500
0.2700
0.2700R

4

0.1000L 0.2000
0.1000 0.1800
0.6700 0.1100
0.1200 0.1700R
0.2100 0.1000
0.1400 0.1000
0.3300 0.2300
0.1700 0.1200
0.1900
0.2000R

23

0.2100
0.3700
0.1000
0.1100R
0.2300

22

3.7900
2.6600
2.6200
2.3700R
0.9700

p. 2A-46

V ppm

8
0.N
10.
0.N
0.N
0.NB
0.N
0.N
0.N
0.N

0.N
0.N
0.N
0.NL
0.N
0.N
0.N
0.N
0.NR

1
0.N
0.N
0.N
0.N
0.N
7.
0.N
0.N
0.N
7.L
0.NR
0.N
0.N
0.N
0.N
7.L
7.
7. R

13
0.N
7.L
20.
10.
15. R
20.
10.
15.
7.L
10.
15.

7
0.N
20.
0.N
0.N
0.N
0.NR
0.N
0.N
0.NR
0.N

0.N
0.N
0.N
7.L
7.
0.N
7.L
7.
7.LR

7. W
0.N
0.N
0.N
0.NW
7.L
7.L
0.N
0.N
0.N
0.N
0.N

6
7.LW
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N

27
0.NW
0.NW
0.N
0.N
0.NW
7.L
0.N
7.

24
0.N
0.N
0.N
0.NR
0.N

0.N
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
0.N
0.NR

25
0.NW
7.
0.N
0.N
0.N
0.NRW
0.N
0.N
0.NR
0.N
0.NR

4
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N

29
0.NW
7.L
0.N
0.N
0.NW
0.N
0.NR
7.L
7.LR
0.N

28
0.N
0.NR
0.N
7.LW
7.L
0.N
0.N

5
7.LW
0.N
0.N
7.L
0.N
0.N
0.N
0.N
0.NR
0.N
0.N
0.NR

0.N
0.N
0.N
0.NR
0.N
0.N
0.N
0.NR
0.N
0.N

9
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
7.
0.NW
0.N
0.N
7. W
10.
10.
7.L
15. W
10.
7.
0.N
10. W
7.L
7.
7. R
7.

10 GH
7.L
7.
0.N
0.N
7.L
7.L
7.L
7.L
20.
15.
10. R
7.L
7.

26
10.
7.
7.L
7.

32
0.N
0.N
7.L
0.NR
0.N

31
0.N
15.
7.
0.N

3
0.N
0.N
0.N
7.LR
0.N
0.N
0.N
0.N
0.N CP
0.N
0.N
0.N
0.N
0.NR

23
0.N
0.N
0.N
0.NR
0.N

2
0.N
0.N
7.L
0.N
0.N
0.N

0.N
0.N
7.
0.N
0.N
7.L
7.LR
7.L
7.L

14
7.L
7.L
7.L
7.LR
0.N
10.
10.
15.
7.

15.
7.
15.
0.N
7.L
100. ←
15.
15.

22
7.
7.L
7.
7. R
0.N

p. 2A-47

Y ppm

```
          8
 0.0000N  0.0000N
10.0000   0.0000N
 0.0000N 10.0000
 0.0000N  0.0000N
 0.0000NR 0.0000N
 0.0000N  0.0000N
 0.0000N  0.0000N
 0.0000N  0.0000N
 0.0000N  0.0000NR
```

```
                      1
                    10.0000
                     0.0000N
                     0.0000N
                     0.0000N
                     0.0000N
                     0.0000N
                     0.0000N
                    20.0000
                     0.0000N
                    10.0000
                    10.0000 R
                     0.0000N
                    20.0000
                     0.0000N
                     0.0000N
    10
 0.0000N GH         10.0000
 0.0000N    26      10.0000
 0.0000N   0.0000N  10.0000 R
 0.0000N   0.0000N
 0.0000N   0.0000N
 0.0000N   0.0000N
 0.0000N
10.0000L
 0.0000N
 0.0000N
 0.0000NR
 0.0000N
10.0000
```

```
      13
 0.0000N
 0.0000N
20.0000
20.0000
20.0000 R
15.0000
15.0000
20.0000
10.0000
20.0000
15.0000
```

```
                                        7
                               0.0000N
                              10.0000L   0.0000N
                               0.0000N  20.0000
                               0.0000N   0.0000N
                               0.0000N   0.0000N
                               0.0000NR 10.0000
                               0.0000N   0.0000N
                               0.0000N   0.0000N
                              10.0000 R  0.0000N
                               0.0000N   0.0000NR
                              6
                              10.0000L W
                               0.0000N W
                               0.0000N W 0.0000N
              27               0.0000N W 0.0000N
           0.0000N  15.0000    0.0000N W
           0.0000N W 0.0000N  10.0000  W
           0.0000N   0.0000N   0.0000N
           0.0000N   0.0000N   0.0000N
           0.0000N  10.0000    0.0000N
           0.0000N W 0.0000N   0.0000N
           0.0000N   0.0000N   0.0000N
           0.0000N   0.0000N   0.0000N
                                 24        25
                               0.0000N   0.0000N W
                               0.0000N   0.0000N W
                               0.0000N   0.0000N
    3                          0.0000NR 10.0000
 0.0000N                       0.0000N   0.0000N
 0.0000N                           4     0.0000NRW
 0.0000N             0.0000N   0.0000N   0.0000N
 0.0000N             0.0000N   0.0000N   0.0000N
 0.0000N             0.0000N   0.0000N   0.0000NR
 0.0000N             0.0000N   0.0000NR  0.0000N
 0.0000N            10.0000    0.0000N   0.0000NR
 0.0000N             0.0000N   0.0000N
 0.0000NcD    23    10.0000    0.0000N
 0.0000N   0.0000N   0.0000N   0.0000N
 0.0000N   0.0000N             0.0000N
 0.0000N   0.0000N             0.0000NR
 0.0000N   0.0000N
 0.0000N   0.0000N
```

```
    29                  9
 0.0000N W           0.0000N
 0.0000N W           0.0000N
10.0000              0.0000N
 0.0000N             0.0000N
 0.0000N W           0.0000N
 0.0000N             0.0000N
 0.0000NR            0.0000N
 0.0000N             0.0000N
 0.0000NR            0.0000N W
 0.0000N             0.0000N
    28               0.0000N
 0.0000N             0.0000N
 0.0000NR           50.0000  W
 0.0000N            50.0000
 0.0000N W          10.0000
 0.0000N             0.0000N
 0.0000N            15.0000  W
 0.0000N            20.0000
             5      10.0000
 0.0000N W 0.0000N   0.0000N
 0.0000N   0.0000N  10.0000  W
 0.0000N  10.0000   50.0000
 0.0000N   0.0000NR 15.0000
 0.0000N  10.0000   10.0000  R
 0.0000N   0.0000N  15.0000
10.0000    0.0000N
10.0000   10.0000LR
10.0000LR  0.0000N
20.0000    0.0000N
10.0000
 0.0000NR
```

```
                       32        31
                    10.0000    0.0000N
                    10.0000   50.0000
                    20.0000    0.0000N
                    15.0000  R 0.0000N
                     0.0000N
             2                    14
           0.0000N            50.0000
           0.0000N            30.0000   20.0000
 0.0000N   0.0000N            20.0000   10.0000
 0.0000N   0.0000N            20.0000R  30.0000
 0.0000N G 0.0000N            10.0000   10.0000
 0.0000N   0.0000N            20.0000   10.0000
 0.0000N  10.0000 R           50.0000   30.0000
 0.0000N   0.0000N            15.0000   30.0000
          10.0000             30.0000   50.0000
                                          22
                                         0.0000N
                                        10.0000
                                        10.0000
                                        10.0000 R
                                         0.0000N
```

Yb ppm

```
        8
0.0000N   0.0000N
1.5000    0.0000N
0.0000N   1.0000
0.0000N   0.0000N
0.0000NR  0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000NR
```

```
                      1                13
                      1.5000           0.0000N
                      0.0000N          0.0000N
                      1.0000L          5.0000
                      0.0000N          2.0000
                      0.0000N          3.0000 R
                      0.0000N          2.0000
                      0.0000N          2.0000
                    2 20.0000 ←        3.0000
                      0.0000N          1.5000
                      1.0000           3.0000
                      1.5000 R         3.0000
                      1.0000L
                      3.0000
                      0.0000N
  10                  0.0000N
0.0000N Grit          1.5000
0.0000N       26      1.0000
0.0000N     0.0000N   2.0000 R
0.0000N     0.0000N
0.0000N     0.0000N
0.0000N     0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
1.0000
```

```
                                 7
                              0.0000N
                              0.0000N   0.0000N
                              0.0000N   1.0000L
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                              0.0000NR  1.0000
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                              0.0000NR  0.0000N
                              0.0000N   0.0000NR
                             6
                              0.0000N W
                              0.0000N
                    0.0000N W 0.0000N
          27        0.0000N   0.0000N
          0.0000N W 2.0000    0.0000N W
          0.0000N   0.0000N   1.0000
          0.0000N   0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N
          0.0000N W 0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N
                                 24        25
                              0.0000N   0.0000N W
                              0.0000N   0.0000N
                              0.0000N   0.0000N
                              0.0000NR  0.0000N
   3                          0.0000N   0.0000N
0.0000N                      4          0.0000NRW
0.0000N             0.0000N   0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000NR
0.0000N             0.0000N   0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000NR
0.0000N             0.0000N   0.0000N
0.0000N        23   1.0000    0.0000N
0.0000N   0.0000N   0.0000N   0.0000N
0.0000N   0.0000N             0.0000N
0.0000N   0.0000N             0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
```

```
   29                    9
0.0000N W           0.0000N
0.0000N             0.0000N
1.0000              0.0000N
0.0000N             0.0000N
0.0000N W           0.0000N
0.0000N             0.0000N
0.0000NR            0.0000N
0.0000N             0.0000N
0.0000NR            0.0000N W
0.0000N             0.0000N
   28               0.0000N
0.0000N             0.0000N
0.0000NR            5.0000 W
0.0000N             5.0000
0.0000N W           1.0000
0.0000N             0.0000N
0.0000N             3.0000 W
0.0000N             3.0000
          5         1.0000
0.0000N W 0.0000N   0.0000N
0.0000N   0.0000N   1.5000 W
0.0000N   1.0000    5.0000
0.0000N   0.0000NR  2.0000
0.0000N   1.0000    2.0000 R
0.0000N   0.0000N   2.0000
1.0000    0.0000N
1.0000    1.0000 R
0.0000NR  0.0000N
2.0000    0.0000N
1.0000
0.0000NR
```

```
                      32        31
                    3.0000    0.0000N
                    2.0000    5.0000
                    3.0000    0.0000N
                    2.0000 R  0.0000N
          2         0.0000N
                                  14
          0.0000N             5.0000
          0.0000N             3.0000    3.0000
0.0000N   0.0000N             2.0000    1.0000
0.0000N   0.0000N             3.0000 R  3.0000
0.0000N   0.0000N             1.0000    1.0000
0.0000N   0.0000N             2.0000    1.5000
0.0000N   0.0000NR            7.0000    3.0000
0.0000N   0.0000N             2.0000    5.0000
          1.0000              3.0000    5.0000
                                          22
                                        0.0000N
                                        1.0000
                                        1.0000
                                        1.0000 R
                                        0.0000N
```

Zn ppm

8
7. 11. 6. 5. 8. R 5.L 5. 15. 5.L
5.L 5.L 5.L 5.L 5.L 5.L 7. 5.L 5.LR

1
5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.L
5.L 5.L 5.LR 5.L 5.L 5.L 5.L 5.L 5.L 5.LR

13
5.L 47.
72. 28. 34. R 36. 27. 21. 44. 10. 23.

7
8. 36. 13. 7. 5. 7. R 29. 5. 5.LR 6.
9. 13. 15. 11. 5.L 5.L 5.L 5.L 5.LR

29
8. W 5. W 5.L 5.L 5.L 5.L W 5.LR 6. 5. R 5.L

28
5.L 5.LR 5.L 21. 5.L W 5.L 5.L

9
5.L 5.L 5.L 5.L 5.L 5.L 5.L 5.L
5. 5.L W 8. 5.L 10. W 6. 5.L 5.L 16. W 6. W 5.L 5.L 8. W 6. 5. 5.LR 5.

10 ah
11. 23. 5.L 5.L
10. 7. 11. 11. 7. 6. 5. R 14. 10.

26
9. 9. 5.L 6.

6
6. 5.L W 5.L 5.L 5.L 5.L 10. 6. 6. 5.L
7. W 8. W 5.L 5.L 12. W 15. W 6. 5.L 5.L 5.L 12. 5.L

27
12. W 16. W 10. 5.L 61. W 16. 12. 41.
High

5
5.L W 5. 5.L 7. 5.L 5.L 5.L 5.L 5.LR 5.L 5.L 5.LR
5.L 5.L 5.L 5.LR 5.L 5.L 5.L 5.LR 5.L 5.L

32
7. 8. 5.L 6. R 16.

31
5.L 13. 6. 34.

24
5.L 5.L 5.L 5.LR 6.
5. 5.L 5.L 5.LR 5.L 5.L 5. 5.L 5.L 5.LR

25
5. W 5. 5.L 5.L 5.L 5.LRW 5.L 5.L 5.LR 5. 8. R

4
5.L 5.L 5.L 5.L 5.L 5.L 5. 20.

3
5. 6. 5. 7. R 10. 5.L 8. 11. 5.L CD
5.L 5.L 5.L 5.L 5.LR

23
5.L 17. 5.L 5.LR 5.L

2
37. 40. 1410. =G 1490. 3650. 1520.
v. High
38. 14. 28. 13. 5. 34. 21. R 5.L 5.

14
13. 5.L 10. 8. R 12. 7. 5.L 5. 5.
19. 17. 57. 5.L 5.L 15. 18. 18.

22
High
20. 17. 95. 93. R 39.

p. 2A-50

Zr ppm

8
50.
700.-
20.-
20.
10. R
20.-
0.N
20.-
50.

20.
30.-
100.-
10.-
10.-
30.-
10.-
10.
10. R

1
500.
30.-
300.-
300.
100.-
200.-
500.-
1000.
200.
70.
500. R
300.-
1500.
200.-
1000.
50.-
70.
200. R

13
10.
15.
1000.
300.
200. R
300.-
200.
500.-
200.
500.-
500.

7
0.N
0.N
10.-
30.-
0.N
0.NR
10.-
150.-
30. R
0.N

10.
50.-
50.-
30.
100.-
10.-
30.
20.
20. R

29
100.
0.N W
100.
100.-
10. W
150. W
100. R
50.
50. R
30.

28
70.
100. R
100.
0.N
20. W
50.
100.

9
10.
20.-
20.-
20.
10.-
30.-
20.-
70.
100.
50. W
200.
15.
150.-
200. W
150.
70.
500.-
700. W
100.
50.-
500.-
70. W
300.
700. R
150.

10 GH
50.
20.-
100.-
50.
0.N
0.N
0.N
0.N
10.L
0.N
200. R
0.N
30.

26
10.
0.N
70.-
0.N

6
50.
10. W
100.
0.N
10.-
10.-
10.-
10.-
20.-
20.

50. W
10.
15.
0.N
0.N W
100. W
30.
20.-
0.N
0.N
0.N
15.

27
10.
30. W
0.N
10.L
30.-
70. W
0.N
10.

5
0.N
15. W
20.
50.-
20.-
10.
30.-
70.
30. R
70.-
50.
15. R

50.
30.-
100.-
30. R
150.-
30.-
20.
20. R
15.-
15.

24
10.
30.-
0.N
10. R
20.

25
0.N W
100.
20.
10.-
10.-
50. RW
150.
10.
10. R
0.N
0.NR

3
0.N
30.-
30.-
30. R
0.N
20.-
20.-
0.N
15.
0.N CD
15.-
0.N
50.
100. R

4
10.
0.N
0.N
10.-
20.-
20.
20.-
0.N

20.
30.-
20.-
15. R
70.-
15.-
20.-
0.N
15.
20. R

23
10.
10.-
0.N
30. R
0.N

32
500.
700.
100.-
100. R
0.N

31
200.
200.-
20.
30.

2
0.N
0.N
0.N
0.N
0.N
20.

30.
0.N
20.-
10.-
0.N
0.N
0.NR
50.-
10.

14
500.
300.-
200.-
500. R
700.-
200.-
200.-
300.-
300.

700.
100.
500.-
300.
500.-
200.
700.-
700.

22
20.
50.
200.-
20. R
0.N

p. 2A-51 (52, Biotite, all N)

Muscovite-Illite %

```
         8
0.3000    0.7000
22.0000   1.0000
0.3000    1.0000
0.5000    0.5000
0.3000R   0.7000
0.0000N   0.3000
0.0000N   0.7000
0.0000N   0.7000
0.0000N   0.5000R
```

```
1
0.2000
0.1000
0.3000
0.1000
2.0000
0.5000
0.1000
0.1000
1.0000
3.0000
2.0000R
1.0000
1.0000
1.0000
0.7000
1.0000
1.5000
1.0000R
```

```
13
0.3000
0.3000
0.0000N
6.0000
6.0000R
9.0000
0.0000N
8.0000
3.0000
5.0000
3.0000
```

```
          7
0.3000
2.0000    0.2000
0.7000    1.0000
0.2000    0.3000
0.2000    0.3000
0.2000R   7.0000
0.7000    0.5000
0.3000    0.7000
0.5000R   0.3000
0.5000    0.1000R
```

```
29
5.0000 W
0.7000
2.0000
1.0000
0.5000 W
0.5000
0.5000R
1.5000
1.5000R
1.0000
28
2.0000
2.0000R
1.5000
1.0000 W
0.2000
1.5000
0.7000
```

```
9
0.3000
0.3000
2.0000
2.0000
0.5000
1.0000
0.7000
0.7000
6.0000 W
3.0000
1.0000
0.1000
5.0000 W
6.0000
6.0000
5.0000
12.0000 W
10.0000
5.0000
1.5000
9.0000 W
3.0000
5.0000
5.0000R
8.0000
```

```
10 GH
1.0000
1.0000
2.0000
1.0000
2.0000
2.0000
2.0000
2.0000
1.5000
1.5000
1.5000R
1.0000
3.0000
```

```
26
6.0000
3.0000
2.0000
1.5000
```

```
                    6
          1.0000 W  2.0000 W
27        0.5000    0.7000
1.0000    3.0000    0.1000
0.7000 W  0.3000    0.0000N
0.2000    0.5000    0.7000 W
0.2000    0.7000    2.0000
2.0000 W  0.3000    3.0000
2.0000    0.3000    0.0000N
0.2000    0.3000    0.0000N
0.3000    0.5000    0.0000N
                    0.0000N
                    0.1000
```

```
           5
1.5000 W   1.0000
0.7000     1.0000
0.7000     1.0000
3.0000     1.5000R
1.5000     1.5000
0.5000     0.1000
2.0000     1.0000
1.5000     1.5000R
0.0000NR   0.2000
2.0000     0.1000
1.5000
1.5000R
```

```
32         31
4.0000     1.0000
7.0000     5.0000
5.0000     7.0000
5.0000R    0.5000
0.3000
```

```
24         25
1.5000     0.3000 W
0.7000     2.0000
0.2000     0.5000
0.3000R    0.5000
1.0000     0.3000
           0.5000RW
```

```
                    4
          0.5000    0.7000    2.0000
          0.2000    2.5000    0.3000
          0.5000    0.3000    0.5000R
          0.5000    0.3000R   0.5000
          0.3000    0.2000    0.7000R
          0.3000    0.5000
          1.0000    1.5000
          2.0000    0.3000
                    1.0000
                    0.7000R
```

```
          2
          1.0000
          0.7000
0.1000    1.0000
0.2000 G  0.5000
0.1000    1.5000
0.1000    1.0000
0.2000    1.0000R
0.1000    0.0000N
          0.0000N
```

```
14
2.0000
1.0000    10.0000
2.0000    1.0000
2.0000R   0.0000N
0.7000    0.5000
9.0000    3.0000
6.0000    8.0000
9.0000    11.0000
5.0000    12.0000
```

```
3
0.0000N
0.0000N
0.2000
0.1000R
0.0000N
0.7000
0.3000
0.0000N
0.2000      23
0.5000 CD   0.7000
0.3000      3.0000
0.3000      0.0000N
0.7000      0.0000NR
0.7000R     0.3000
```

```
22
2.0000
1.5000
2.0000
1.5000R
1.5000
```

p. 2A-53

Muscovite-Illite Modifier

1-Muscovite

2-Intermediate

3-Illite

8
```
2.0000   2.0000
1.5000   2.0000
1.0000   1.0000
1.0000   1.0000
1.0000R  1.0000
0.0000B  1.0000
0.0000B  1.0000
0.0000B  2.0000
0.0000B  1.0000R
```

1
```
3.0000
3.0000
3.0000
3.0000
3.0000
3.0000
2.0000
0.0000B
2.0000
3.0000
3.0000R
3.0000
3.0000
3.0000
2.0000
2.0000
2.0000
3.0000 R
```

13
```
3.0000
2.0000
0.0000B
3.0000
3.0000 R
3.0000
0.0000B
3.0000
2.0000
2.0000
3.0000
```

7
```
0.0000B
1.0000   0.0000B
2.0000   2.0000
1.0000   2.0000
0.0000B  3.0000
0.0000BR 1.0000
2.0000   0.0000B
2.0000   1.0000
3.0000R  2.0000
3.0000   0.0000BR
```

27
```
                  6
          2.0000W 3.0000W
          0.0000B 2.0000
2.0000W   2.0000  0.0000B
2.0000W   2.0000  0.0000B
0.0000B   3.0000  2.0000W
0.0000B   3.0000  3.0000
2.0000W   3.0000  3.0000
2.0000    3.0000  0.0000B
0.0000B   2.0000  0.0000B
2.0000    2.0000  0.0000B
                  0.0000B
                  0.0000B
                  0.0000B
```

24 25
```
0.0000B  2.0000W
3.0000   3.0000
3.0000   3.0000
2.0000R  2.0000
2.0000   0.0000B
         2.0000RW
```

4
```
2.0000   2.0000   3.0000 /
2.0000   3.0000   3.0000
2.0000   2.0000   3.0000R
2.0000   2.0000R  0.0000B
0.0000B  2.0000   2.0000R
2.0000   3.0000
2.0000   2.0000
3.0000   2.0000
         2.0000
         3.0000R
```

3
```
0.0000B
0.0000B
1.0000
0.0000BR
0.0000B
1.0000
2.0000
0.0000B
0.0000B      23
2.0000 CD 2.0000
2.0000    1.0000
2.0000    0.0000B
2.0000    0.0000BR
2.0000R   2.0000
```

29
```
1.0000W
2.0000
1.0000
1.0000
1.0000W
2.0000
1.0000R
2.0000
2.0000R
0.0000B
```

28
```
2.0000
2.0000R
2.0000
3.0000W
0.0000B
3.0000
3.0000
```

5
```
3.0000W   3.0000
0.0000B   3.0000
2.0000    3.0000
3.0000    2.0000R
3.0000    3.0000
3.0000    0.0000B
1.0000    0.0000B
3.0000    2.0000R
0.0000BR  0.0000B
3.0000    0.0000B
3.0000
2.0000R
```

9
```
2.0000
2.0000
3.0000
2.0000
3.0000
3.0000
3.0000
3.0000
2.0000W
2.0000
2.0000
0.0000B
2.0000W
2.0000
2.0000
2.0000
2.0000W
2.0000
1.0000
3.0000
2.0000W
2.0000
2.0000
2.0000R
2.0000
```

10 26
```
3.0000GH
3.0000
3.0000   3.0000
3.0000   3.0000
3.0000   3.0000
3.0000   3.0000
3.0000
2.0000
0.0000B
3.0000
3.0000R
0.0000B
3.0000
```

32 31
```
2.0000   2.0000
2.0000   2.0000
3.0000   2.0000
2.0000R  0.0000B
0.0000B
```

2
```
          0.0000B
          2.0000
0.0000B   3.0000
2.0000G   3.0000
0.0000B   2.0000
0.0000B   3.0000
0.0000B   2.0000R
0.0000B   0.0000B
          0.0000B
```

14
```
2.0000
3.0000   3.0000
3.0000   3.0000
2.0000R  0.0000B
2.0000   3.0000
2.0000   3.0000
1.0000   3.0000
2.0000   3.0000
2.0000   3.0000
```

22
```
3.0000
3.0000
3.0000
3.0000R
3.0000
```

p. 2A-54

Mixed-layer clay %

8
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000B 0.0000N
0.0000N 0.0000NR

1
0.2000
0.2000
1.0000
0.2000
1.0000
0.5000
0.3000
0.5000
0.3000
0.0000N
0.5000 R
0.0000N
0.0000N
0.0000N
0.0000N
0.5000
0.0000N
0.0000BR

13
0.0000N
1.0000
12.0000
0.0000N
0.0000NR
0.0000N
4.0000
2.0000
1.0000
5.0000
7.0000

7
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR 0.0000N
0.0000N 0.0000NR

29
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000NR
0.0000N

28
0.0000N
0.0000NR
0.0000N
0.3000
0.0000N W
0.3000
0.2000

9
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000B
0.0000N
0.0000N
0.0000N W
1.0000
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000NR
0.0000N

10
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

26
0.0000N
0.0000N
0.0000N
0.0000N

6
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

27
0.0000N 0.0000N
0.0000N W 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.5000 W 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N

5
0.0000N 0.2000
0.0000N W 0.0000N
0.0000N 0.2000
0.0000N 0.1000 R
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000B 0.0000NR
1.5000 R 0.0000N
0.0000N 0.0000N
0.0000N
0.0000NR

32
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N

31
0.0000N
0.0000N
0.0000N
0.0000N

24
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N

25
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000NRW
0.0000N
0.1000
0.0000NR
0.0000N
0.0000NR

3
0.1000
0.0000N
0.0000N
0.0000NR
0.3000
0.5000
0.0000N
1.0000
0.5000
0.0000N
0.0000N
0.1000
0.1000
0.1000 R

23
0.0000N
0.0000N
0.0000N
0.0000BR
0.1000

4
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.5000
0.0000N 0.1000
0.0000N
0.0000NR

2
0.0000N
0.0000N
0.0000N 0.0000N
0.2000 0.0000N
0.1000 0.0000N
0.3000 0.0000N
0.0000N 0.0000NR
0.0000N 6.0000
7.0000

14
0.1000
0.0000N 4.0000
0.0000N 0.0000N
0.0000NR 1.0000
0.0000N 0.0000N
0.0000N 0.5000
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N

22
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N

p.2A-55

Mixed-layer Modifier

1-ISII ordered
~~2~~-IS ordered
3-I/S random
4-S>I
5-S>>I
6-Cl-S

I-Illite
S-Smectite
Cl-Chlorite

```
                                    0.0000B 7
                                    0.0000B     0.0000B
                                    0.0000B     0.0000B
                                    0.0000B     0.0000B
                                    0.0000B     0.0000B
                                    0.0000BR    0.0000B
                                    0.0000B     0.0000B
                                    0.0000B     0.0000B
                                    0.0000BR    0.0000B
                                    0.0000B     0.0000BR
                                  6 0.0000B
                                    0.0000B W
                        0.0000B W   0.0000B
            27          0.0000B     0.0000B
            0.0000B     0.0000B     0.0000B
            0.0000B     0.0000B     0.0000B W
            0.0000B     0.0000B     0.0000B
            0.0000B     0.0000B     0.0000B
            0.0000B     0.0000B     0.0000B
            3.0000      0.0000B     0.0000B
            0.0000B     0.0000B     0.0000B
            0.0000B     0.0000B     0.0000B
                                    24          25
                                    0.0000B     0.0000B W
                                    0.0000B     0.0000B
                                    0.0000B     0.0000B
 3                                  0.0000BR    0.0000B
3.0000                              0.0000B     0.0000B
0.0000B                             4           0.0000BRW
0.0000B                 0.0000B     0.0000B     0.0000B
0.0000BR                0.0000B     0.0000B     3.0000
4.0000                  0.0000B     0.0000B     0.0000BR
4.0000                  0.0000B     0.0000BR    0.0000B
0.0000B                 0.0000B     0.0000B     0.0000BR
5.0000                  0.0000B     0.0000B
4.0000      23          0.0000B     6.0000
0.0000B CD  0.0000B     0.0000B     3.0000
0.0000B     0.0000B                 0.0000B
3.0000      0.0000B                 0.0000BR
3.0000      0.0000BR
3.0000 R    3.0000
```

```
         8
0.0000B     0.0000B
0.0000B     0.0000B
0.0000B     0.0000B
0.0000B     0.0000B
0.0000BR    0.0000B
0.0000B     0.0000B
0.0000B     0.0000B
0.0000B     0.0000B
0.0000B     0.0000BR
```

```
 29                      9
0.0000B                 0.0000B
0.0000B W               0.0000B
0.0000B                 0.0000B
0.0000B                 0.0000B
0.0000B W               0.0000B
0.0000B                 0.0000B
0.0000BR                0.0000B
0.0000B                 0.0000B
0.0000BR                0.0000B W
0.0000B                 0.0000B
 28                     0.0000B
0.0000B                 0.0000B
0.0000BR                0.0000B W
0.0000B                 0.0000B
3.0000                  0.0000B
0.0000B W               0.0000B
3.0000                  0.0000B W
4.0000                  0.0000B
            5           6.0000
0.0000B W   3.0000      0.0000B
0.0000B     0.0000B     0.0000B W
0.0000B     3.0000      0.0000B
0.0000B     3.0000 R    0.0000B
0.0000B     0.0000B     0.0000BR
0.0000B     0.0000B     0.0000B
0.0000B     0.0000B
0.0000B     0.0000BR
1.0000 R    0.0000B
0.0000B     0.0000B
0.0000B
0.0000BR
```

```
                        1           13
                        3.0000      0.0000B
                        2.0000      3.0000
                        5.0000      1.0000
                        5.0000      0.0000B
                        3.0000      0.0000BR
                        4.0000      0.0000B
                        5.0000      1.0000
                        5.0000      1.0000
                        2.0000      2.0000
                        0.0000B     1.0000
                        2.0000 R    1.0000
                        0.0000B
                        0.0000B
                        0.0000B
 10                     0.0000B
0.0000B GH              2.0000
0.0000B     26          0.0000B
0.0000B     0.0000B     0.0000BR
0.0000B     0.0000B
0.0000B     0.0000B
0.0000B     0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
```

```
                        32          31
                        0.0000B     0.0000B
                        0.0000B     0.0000B
                        0.0000B     0.0000B
                        0.0000BR    0.0000B
                        0.0000B
             2                                  14
            0.0000B                 3.0000
            0.0000B                 0.0000B     1.0000
0.0000B     0.0000B                 0.0000B     0.0000B
4.0000 G    0.0000B                 0.0000BR    1.0000
4.0000      0.0000B                 0.0000B     0.0000B
6.0000      0.0000B                 0.0000B     2.0000
0.0000B     0.0000BR                0.0000B     0.0000B
0.0000B     1.0000                  0.0000B     0.0000B
            1.0000                  0.0000B     0.0000B
                                                22
                                                0.0000B
                                                0.0000B
                                                0.0000B
                                                0.0000BR
                                                0.0000B
```

Kaolinite %

8
0.2000 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.7000 0.0000N
0.5000 0.0000N
0.0000N 0.0000N
0.2000 0.0000NR

1
0.3000
0.3000
0.3000
0.1000
0.1000
0.1000
0.1000
0.1000
0.1000
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

13
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
1.0000
2.0000
0.5000
1.0000
3.0000

7
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.1000
0.1000 0.2000
0.1000 R0.0000N
0.3000 0.0000N
0.0000N 0.3000
0.0000NR0.1000
0.2000 0.0000NR

29
0.0000N
0.0000N W
0.0000N
0.0000N
0.1000
0.0000N W
0.0000NR
0.2000
0.5000 R
0.0000N

28
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N W
0.0000N
0.3000

9
0.1000
0.3000
0.5000
0.2000
0.3000
0.1000
0.0000N
0.5000
0.0000N W
0.5000
0.0000N
0.3000
1.0000 W
0.5000
0.5000
0.3000
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000NR
0.0000N

10 Gr11
0.2000
0.5000
0.0000N

26
0.0000N
0.0000N 0.1000
0.0000N 1.0000
0.0000N 0.2000
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

6
0.0000N
0.0000N W

27
0.5000 0.0000N
0.0000N W 0.0000N
0.0000N 0.2000 0.0000N W
0.0000N W 0.0000N 0.1000
0.0000N 0.2000 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N W 0.2000 0.0000N
0.3000 W 0.0000N 0.0000N
0.0000N 0.1000 0.0000N
0.0000N 0.2000 0.0000N

5
0.0000N W 0.2000
0.0000N 0.0000N
0.0000N 0.1000
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000NR 0.0000N
0.0000N 0.0000N
0.0000N
0.0000NR

24 25
0.0000N 0.0000N W
0.0000N 0.0000N W
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000N

4
0.0000NRW
0.0000N 0.0000N 0.0000N /
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000NR
0.0000N 0.0000NR0.0000N
0.0000N 0.0000N 0.0000NR
0.0000N 0.0000N
0.1000 0.0000N
0.0000N 0.0000N
0.0000N
0.0000NR

3
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.1000
0.0000N
0.0000N
0.0000N CD

23
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000NR0.0000N

32 31
0.0000N 0.1000
0.0000N 0.5000
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N

2
0.0000N
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.5000 =G 0.0000N
0.5000 0.0000N
0.5000 0.0000NR
0.3000 0.0000N
0.0000N

14
2.0000
1.5000 0.0000N
1.5000 1.5000
1.5000 R 0.0000N
1.0000 1.0000
0.0000N 1.0000
0.0000N 2.0000
0.0000N 2.0000
0.0000N 1.0000

22
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N

Kaolinite
Modifier

1-Well crystallized

2-Intermediate

3-Poorly crystallized

```
        8
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000BR 0.0000B
1.0000  0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000BR
```

```
                                    7
                              0.0000B
                              0.0000B   0.0000B
                              0.0000B   0.0000B
                              0.0000B   0.0000B
                              0.0000B   1.0000
                              0.0000BR  0.0000B
                              1.0000    0.0000B
                              0.0000B   3.0000
                              0.0000BR  0.0000B
                              0.0000B   0.0000BR
                              6
                              0.0000B
                              0.0000BW
                    1.0000    0.0000B
          27        0.0000BV  0.0000B
          0.0000B   1.0000    0.0000B
          0.0000BW  0.0000B   0.0000BW
          0.0000B   1.0000    0.0000B
          0.0000B   0.0000B   0.0000B
          0.0000BW  1.0000    0.0000B
          0.0000B   0.0000B   0.0000B
          0.0000B   0.0000B   0.0000B
          0.0000B   0.0000B   0.0000B
                              24        25
                              0.0000B   0.0000B
                              0.0000B   0.0000BW
                              0.0000B   0.0000B
3                             0.0000BR  0.0000B
0.0000B                       0.0000B   0.0000B
0.0000B                       4         0.0000BRW
0.0000B             0.0000B   0.0000B   0.0000B
0.0000BR            0.0000B   0.0000B   0.0000B
0.0000B             0.0000B   0.0000B   0.0000BR
0.0000B             0.0000B   0.0000BR  0.0000B
0.0000B             0.0000B   0.0000B   0.0000BR
0.0000B             0.0000B   0.0000B
0.0000B   23        2.0000    0.0000B
0.0000B   0.0000B   0.0000B   0.0000N
0.0000B   0.0000B             0.0000B
0.0000B   0.0000B             0.0000BR
0.0000B   0.0000BR
0.0000BR  0.0000B
```

```
29                  9
0.0000B             1.0000
0.0000BW            2.0000
0.0000B             3.0000
0.0000B             2.0000
0.0000B             2.0000
0.0000BW            0.0000B
0.0000BR            0.0000B
1.0000              1.0000
2.0000 R            0.0000BW
0.0000B             2.0000
28                  0.0000B
0.0000B             2.0000
0.0000BR            2.0000
0.0000B             2.0000 W
0.0000B             0.0000B
0.0000BW            0.0000B
0.0000B             0.0000B
1.0000              0.0000BW
                    0.0000B
          5
0.0000B   0.0000B   0.0000B
0.0000BW  0.0000B   0.0000B
0.0000B   0.0000B   0.0000BW
0.0000B   0.0000BR  0.0000B
0.0000B   0.0000B   0.0000BR
0.0000B   0.0000B   0.0000B
0.0000B   0.0000B
0.0000B   0.0000BR
0.0000BR  0.0000B
0.0000B   0.0000B
0.0000B
0.0000BR
```

```
                    1                                      13
                    1.0000                                 0.0000B
                    1.0000                                 0.0000B
                    2.0000                                 0.0000B
                    2.0000                                 0.0000B
                    0.0000B                                0.0000BR
                    0.0000B                                0.0000B
                    0.0000B                                1.0000
                    1.0000                                 1.0000
                    1.0000                                 1.0000
                    0.0000B                                1.0000
                    0.0000BR                               1.0000
                    0.0000B
                    0.0000B
                    0.0000B
                    0.0000B
10                  0.0000B
1.0000 Gt           0.0000B
1.0000    26        0.0000B
0.0000B   0.0000B
0.0000B   0.0000B
0.0000B   1.0000
0.0000B   1.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
```

```
                    32        31
                    0.0000B   2.0000
                    0.0000B   2.0000
                    0.0000B   0.0000B
                    0.0000BR  0.0000B
                    0.0000B
          2                             14
          0.0000B             1.0000
          0.0000B             1.0000    0.0000B
0.0000B   0.0000B             1.0000    1.0000
0.0000B   0.0000B             1.0000 R  0.0000B
0.0000B   0.0000B             1.0000    1.0000
2.0000    0.0000B             0.0000B   1.0000
1.0000    0.0000BR            0.0000B   1.0000
1.0000    0.0000B             0.0000B   1.0000
          0.0000B             0.0000B   1.0000
                                        22
                                        0.0000B
                                        0.0000B
                                        0.0000B
                                        0.0000BR
                                        0.0000B
```

Chlorite %

8
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR

1
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

13
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

7
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000NR

29
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000NR
0.0000N
0.0000NR
0.0000N

28
0.0000N
0.0000NR
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N

9
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N
5.0000 W
0.0000N
0.0000N
0.0000N
0.0000N W
0.5000
0.0000N
0.0000NR
0.0000N

10 GH
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.1000
0.0000N
0.0000NR
0.0000N
0.0000N

26
0.0000N
0.0000N
0.0000N
0.0000N

6
0.0000N
0.0000N W
0.0000N 0.0000N
0.0000N W 0.0000N

27
0.0000N W 0.0000N 0.0000N W
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N W 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N

5
0.0000N 0.0000N
0.0000N W 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000NR0.0000N
0.0000N 0.0000N
0.0000N
0.0000NR

24 25
0.0000N 0.0000N W
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000N
0.0000NRW

4
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000NR
0.0000N 0.0000NR0.0000N
0.0000N 0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N
0.0000NR

3
0.1000
0.0000N
2.0000
2.0000 R
0.0000N
0.0000N
0.0000N
1.0000
0.0000N

23
0.0000N CR 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000NR0.0000N

32 31
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N

2
0.0000N
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.5000 Gr 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.1000 0.0000N
0.0000N

14
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N

22
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N

p. 2A-59

Corrensite %

```
                                    7
                               0.0000N
                               0.0000N  0.0000N
                               0.0000N  0.0000N
                               0.0000N  0.0000N
                               0.0000N  0.0000N
                               0.0000N  0.0000N
                               0.0000N  0.0000N
                               0.0000N  0.0000N
                               0.0000N  0.0000N
                               0.0000N  0.0000N
                              6
                               0.0000N
                               0.0000N
                      0.0000N  0.0000N
                      0.0000N  0.0000N
               27
             0.0000N  0.0000N  0.0000N
             0.0000N  0.0000N  0.0000N
             0.0000N  0.0000N  0.0000N
             0.0000N  0.0000N  0.0000N
             0.0000N  0.0000N  0.0000N
             0.0000N  0.0000N  0.0000N
             0.0000N  0.0000N  0.0000N
             0.0000N  0.0000N  0.0000N
                                 24       25
                               0.0000N  0.0000N
                               0.0000N  0.0000N
                               0.0000N  0.0000N
                               0.0000N  0.0000N
     3
  0.0000N                      0.0000N  0.0000N
  0.0000N                               0.0000N
                             4
  0.5000              0.0000N  0.0000N  0.0000N
→ 1.0000 R            0.0000N  0.0000N  0.0000N
  0.0000N             0.0000N  0.0000N  0.0000N
  0.0000N             0.0000N  0.0000N  0.0000N
  0.0000N             0.0000N  0.0000N  0.0000N
  0.0000N             0.0000N  0.0000N
               23
  0.0000N             0.0000N  0.0000N
  0.0000N CD 0.0000N  0.0000N  0.0000N
  0.0000N    0.0000N           0.0000N
  0.0000N    0.0000N           0.0000N
  0.0000N    0.0000N
  0.0000N    0.0000N
```

```
        8
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
```

```
   29                9
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
                  0.0000N
   28
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
0.0000N           0.0000N
                  0.0000N
          5
0.0000N  0.0000N  0.0000N
0.0000N  0.0000N  0.0000N
0.0000N  0.0000N  0.0000N
0.0000N  0.0000N  0.0000N
0.0000N  0.0000N  0.0000N
0.0000N  0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N
0.0000N
```

```
                    1                   13
                  0.0000N             0.0000N
                  0.0000N             0.0000N
                  0.0000N             0.0000N
                  0.0000N             0.0000N
                  0.0000N             0.0000N
                  0.0000N             0.0000N
                  0.0000N             0.0000N
                  0.0000N             0.0000N
                  0.0000N             0.0000N
                  0.0000N             0.0000N
                  0.0000N             0.0000N
                  0.0000N
                  0.0000N
                  0.0000N
                  0.0000N
   10
0.0000N           0.0000N
           26
0.0000N           0.0000N
0.0000N  0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
                   32       31
                  0.0000N  0.0000N
                  0.0000N  0.0000N
                  0.0000N  0.0000N
                  0.0000NR 3.5000  ←
                  0.0000N
           2                  14
         0.5000            0.0000N
         0.5000            0.0000N  0.0000N
0.0000N  1.0000            0.0000N  0.0000N
0.0000N  1.0000            0.0000N  0.0000N
0.0000N  0.0000N           0.0000N  0.0000N
0.0000N  0.0000N           0.0000N  0.0000N
0.0000N  0.0000NR          0.0000N  0.0000N
0.0000N  0.0000N           0.0000N  0.0000N
         0.0000N           0.0000N  0.0000N
                                      22
                                    0.0000N
                                    0.0000N
                                    0.0000N
                                    0.0000N
                                    0.0000N
```

Talc %

```
                                                                      8                                                           1                             13
                                                            0.0000N   0.0000N                                                     0.0000N                       0.0000N
                                                            0.0000N   0.0000N                                                     0.0000N                       0.0000N
                                                            0.0000N   0.0000N                                                     0.0000N                       0.0000N
                                                            0.0000N   0.0000N                                                     0.0000N                       0.0000N
                                                            0.0000NR  0.0000N                                                     0.0000N                       0.0000N
                                                            0.1000    0.0000N                                                     0.0000N                       0.0000N
                                                            0.0000N   0.0000N                                                     0.0000N                       0.0000N
                                                            0.0000N   0.0000N                                                     0.0000N                       0.0000N
                                                            0.0000N   0.0000N                                                     0.0000N                       0.0000N
                                                                                                                                  0.0000N                       0.0000N
                                                                                                                                  0.0000N                       0.0000N
                                                                                                                                  0.0000N
                                                                                                                                  0.0000N
                                                                                                                                  0.0000N
                                                                                                              10                  0.0000N
                              0.0000N7                      29                  9                             0.0000N             0.0000N
                              0.0000N   0.0000N             0.0000N             0.0000N                       0.0000N   26        0.0000N
                              0.0000N   0.0000N             0.0000N             0.0000N                       0.0000N   0.0000N   0.0000N
                              0.0000N   0.0000N             0.0000N             0.0000N                       0.0000N   0.0000N
                              0.0000N   0.0000N             0.0000N             0.0000N                       0.0000N   0.0000N
                              0.0000N   0.0000N             0.0000N             0.0000N                       0.0000N   0.0000N
                              0.0000N   0.0000N             0.0000N             0.0000N                       0.0000N
                              0.0000N   0.0000N             0.0000N             0.0000N                       0.0000N
                              0.0000N   0.0000N             0.0000N             0.0000N                       0.0000N
                              0.0000N   0.0000N             0.0000N             0.0000N                       0.0000N
                              6                             0.0000N             0.0000N                       0.0000N
                              0.0000N                       28                  0.0000N                       0.0000N
                              0.0000N                       0.0000N             0.0000N                       0.0000N
                    0.0000N   0.0000N                       0.0000N             0.0000N
          27        0.0000N   0.0000N                       0.0000N             0.0000N
          0.0000N   0.0000N   0.0000N                       0.0000N             0.0000N
          0.0000N   0.0000N   0.0000N                       0.0000N             0.0000N
          0.0000N   0.0000N   0.0000N                       0.0000N             0.0000N
          0.0000N   0.0000N   0.0000N                       0.0000N             0.0000N
          0.0000N   0.0000N   0.0000N                                 5         0.0000N                                 32        31
          0.0000N   0.0000N   0.0000N                       0.0000N   0.0000N   0.0000N                                 0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N                       0.0000N   0.0000N   0.0000N                                 0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N                       0.0000N   0.0000N   0.0000N                                 0.0000N   0.0000N
                              24        25                  0.0000N   0.0000N   0.0000N                                 0.0000N   0.0000N
                              0.0000N   0.0000N             0.0000N   0.0000N   0.0000N                                 0.0000N
                              0.0000N   0.0000N             0.0000N   0.0000N   0.0000N                       2                   14
                              0.0000N   0.0000N             0.0000N   0.0000N                                 0.0000N             0.0000N
3                             0.0000NR  0.0000N             0.0000N   0.0000N                                 0.0000N             0.0000N   0.0000N
1.0000                        0.0000N   0.0000N             0.0000N   0.0000N                       0.0000N   0.0000N             0.0000N   0.0000N
1.0000                        4         0.0000N             0.0000N   0.0000N                      →0.7000 G  0.0000N             0.0000N   0.0000N
1.0000              0.0000N   0.0000N   0.0000N             0.0000N                                 0.0000N   0.0000N             0.0000N   0.0000N
0.5000 R            0.0000N   0.0000N   0.0000N             0.0000N                                 0.0000N   0.0000N             0.0000N   0.0000N
5.0000              0.0000N   0.0000N   0.0000N                                                     0.0000N   0.0000N             0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000N                                                     0.0000N   0.0000N             0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000N                                                               0.0000N             0.0000N   0.0000N
7.0000              0.0000N   0.0000N
0.2000    23        0.0000N   0.0000N                                                                                                       22
0.0000NCD 0.0000N   0.0000N   0.0000N                                                                                                       0.0000N
0.0000N   0.0000N             0.0000N                                                                                                       0.0000N
0.0000N   0.0000N             0.0000N                                                                                                       0.0000N
0.0000N   0.0000N                                                                                                                           0.0000N
0.0000N   0.0000N                                                                                                                           0.0000N
```

p.2A-61

Total clay %

8

0.5000
22.0000
0.3000
0.5000
0.3000R
0.8000
0.5000
> .0000
0.2000

0.7000
1.0000
1.0000
0.5000
0.7000
0.3000
0.7000
0.7000
0.5000R

1

0.7000
0.6000
1.6000
0.4000
3.1000
1.1000
0.5000
0.7000
1.4000
3.0000
2.5000R
1.0000
1.0000
1.0000
0.7000
1.5000
1.5000
1.0000R

High

13

0.3000
1.3000
12.0000
6.0000
6.0000R
9.0000
5.0000
12.0000
4.5000
11.0000
13.0000

7

0.3000
2.0000
0.7000
0.2000
0.3000
0.3000R
1.0000
0.3000
0.5000R
0.7000

0.2000
1.0000
0.4000
0.5000
7.0000
0.5000
1.0000
0.4000
0.1000R

29

5.0000W
0.7000
2.0000
1.0000
0.6000W
0.5000
0.5000R
1.7000
2.0000R
1.0000

9

0.4000
0.6000
2.5000
2.2000
0.8000
1.1000
0.7000
1.2000
6.0000W
3.5000
1.0000
0.4000
6.0000W
6.5000W
6.5000
5.3000
17.0000W
10.0000W
6.0000
1.5000
9.0000W
3.5000
5.0000
5.0000R
8.0000

10

1.2000 silt
1.5000
2.0000
1.0000
2.0000
2.0000
2.0000
2.0000
1.6000
1.5000
1.5000R
1.0000
3.0000

26

6.0000
3.1000
3.0000
1.7000

6

2.0000W
0.7000
0.1000
.0000
0.7000W
2.1000
3.0000
.0000
.0000
.0000
.0000
0.1000

27

1.0000W
0.7000
0.2000
0.2000
2.0000W
2.8000
0.2000
0.3000

1.5000W
0.5000
3.2000
0.3000
0.7000
0.7000
0.5000
0.3000
0.4000
0.7000

28

2.0000
2.0000R
1.5000
1.3000
0.2000W
1.8000
1.2000

5

1.5000W
0.7000
0.7000
3.0000
1.5000
0.5000
2.0000
1.5000
1.5000R
2.0000
1.5000
1.5000R

1.4000
1.0000
1.3000
1.6000R
1.5000
0.1000
1.0000
1.5000R
0.2000
0.1000

High

32

4.0000
7.0000
5.0000
5.0000R
0.3000

31

1.1000
5.5000
7.0000
4.0000

24

1.5000
0.7000
0.2000
0.3000R
1.0000

25

0.3000W
2.0000
0.5000
0.5000
0.3000
0.5000RW
2.0000
0.4000
0.5000R
0.5000
0.7000R

2

0.1000
1.1000G
1.2000
0.9000
0.7000
0.5000

1.5000
1.2000
2.0000
1.5000
1.5000
1.0000
1.0000R
6.0000
7.0000

High

14

4.1000
2.5000
3.5000
3.5000R
1.7000
9.0000
6.0000
9.0000
5.0000

14.0000
2.5000
1.0000
1.5000
4.5000
10.0000
13.0000
13.0000

3

1.2000
1.0000
3.7000
3.6000R
5.3000
1.3000
0.3000
9.0000
0.9000 CD
0.5000
0.3000
0.4000
0.8000
0.8000R

4

0.5000
0.2000
0.5000
0.5000
0.3000
0.3000
1.1000
2.0000

0.7000
2.5000
0.3000
0.3000R
0.2000
0.5000
2.0000
0.4000
1.0000
0.7000R

23

0.7000
3.0000
.0000
.0000R
0.4000

22

2.0000
1.5000
2.0000
1.5000R
1.5000

Quartz %

8

99.
77.
99.
99.
99.R
99.
99.
100.
99.

98.
99.
99.
99.
99.
99.
99.
99.
99.R

1

99.
99.
97.
98.
93.
96.
99.
99.
95.
93.
93.R
98.
98.
98.
98.
93.
74.
75.R

13

99.
98.
68.
72.
73.R
70.
72.
74.
83.
72.
79.

7

81.
60.
98.
99.
99.
99.R
98.
99.
99.R
98.

99.
98.
97.
93.
92.
99.
98.
99.
99.R

29

65.
84.W
96.
98.
97.W
99.
99.R
76.
77.R
93.

28

98.
98.R
98.
83.W
99.
98.
98.

9

99.
99.
96.
96.
98.
98.
99.
99.
87.W
96.
98.
99.
81.W
78.
84.
92.
61.W
73.
94.
98.
77.W
78.
76.
75.R
76.

10

64.GH
61.
86.
95.
10.
5.
3.
6.
79.
70.
72.R
6.
31.

26

29.
30.
90.
37.

6

72.W
84.
97.
92.
99.
99.
99.
99.
99.
99.

54.W
49.
99.
94.
61.W
69.
97.
100.
99.
93.
94.
99.

27

74.W
70.
95.
94.
80.W
96.
99.
84.

24

98.
99.
99.
99.R
99.

25

88.W
82.
99.
99.
93.
94.RW
96.
99.
99.R
83.
84.R

5

91.W
75.
99.
97.
98.
99.
98.
98.
98.R
98.
98.
98.R

98.
99.
98.
98.R
98.
99.
99.
98.R
99.
99.

32

96.
92.
92.
93.R
0.2 ←

31

97.
86.
86.
91.

2

93.
95.
61.G
75.
27.
53.

74.
77.
60.
71.
67.
52.
53.R
94.
92.

14

89.
94.
92.
93.R
95.
83.
84.
81.
90.

70.
80.
95.
94.
89.
75.
81.
83.

22

68.
55.
48.
49.R
38.

3

99.
80.
94.
95.R
92.
97.
99.
85.
99.CD
99.
99.
99.
99.
99.R

23

99.
96.
100.
100.R
99.

4

99.
99.
89.
99.
99.
99.
95.
98.

99.
97.
99.
99.R
99.
99.
97.
99.
98.
98.R

p. 2A-63

K-feldspar %

```
           8
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
```

Low High

```
   1             13
0.1000         0.0000N
0.0000N        0.0000N
0.1000        20.0000
0.0500        20.0000
3.0000        19.0000 R
2.5000        20.0000
0.0000N        9.0000
0.1000        15.0000
3.0000        10.0000
3.0000        15.0000
3.0000 R      10.0000
1.0000
0.5000
1.0000
1.0000
2.5000
0.3000
0.3000 R
```

```
                    7
        0.0000N
        0.0000N 0.0000N
        0.0000N 0.0000N
        0.0000N 0.0000N
        0.0000N 0.0000N
        0.0000NR0.5000
        0.0000N 0.0000N
        0.0000N 0.5000
        0.0000NR0.1000
        0.0000N 0.1000 R
       6
        0.5000
        0.0000N W
        1.5000  0.0000N
  27    0.0000N W 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N W 0.0000N 0.2000 W
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N W 0.0000N 0.0000N
0.0000N W 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
```

```
                           24        25
                        0.0000N   0.2000 W
                        0.0000N   2.0000
                        0.3000    0.0000N
   3                    0.1000 R  0.0000N
0.0000N                 0.0000N   0.0000N
0.0000N                           0.1000 RW
0.0000N          0.0000N   4 0.0000N   1.5000 /
0.0000NR         0.1000   0.0000N   0.0000N
0.0000N          0.0000N  0.0000N   0.0000NR
0.0000N          0.0000N  0.0000NR  0.1000
0.0000N          0.0000N  0.0000N   0.0000NR
0.1000           0.0000N  0.0000N
0.0000N    23    0.0000N  0.0000N
0.0000N CD 0.0000N 0.0000N 0.0000N
0.0000N   0.0000N         0.0000N
0.0000N   0.0000N         0.0000NR
0.0000N   0.0000NR
0.0000NR  0.0000N
```

```
  29                  9
0.1000             0.2000
0.0000N W          0.0000N
2.0000             1.0000
0.0000N            1.0000
0.0000N            0.5000
0.1000 W           0.0000N
0.1000 R           0.0000N
1.5000             0.0000N
1.5000 R           6.0000 W
0.1000             0.2000
  28               0.0000N
0.0000N            0.0000N
0.1000 R           6.0000 W
0.0000N            6.0000
1.0000             7.0000
0.0000N W          2.0000
0.0000N           18.0000 W
0.0000N           14.0000
          5        0.0000N
0.0000N 0.0000N    0.0000N
0.0000N W 0.0000N 12.0000 W
0.0000N 0.0000N    2.0000
0.0000N 0.0000NR   8.0000
0.0000N 0.0000N   19.0000 R
0.0000N 0.0000N   15.0000
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000NR0.0000N
0.0000N 0.0000N
0.0000N
0.0000NR
```

```
  10 GH
0.3000       26
1.0000
2.0000    3.0000
2.0000    3.0000
3.0000    6.0000
2.0000    0.5000
2.0000
2.0000
1.5000
1.5000
1.0000 R
2.0000
8.0000
```

```
                      32       31
                   0.0000N  1.0000
                   0.0000N  3.0000
                   0.0000N  3.0000
                   0.0000NR 0.0000N
                   0.0000N
          2                          14
          0.1000            5.0000
          0.5000            3.0000  15.0000
0.0000N   0.0000N           3.0000   2.0000
0.0000N G 0.0000N           3.0000 R 0.0000N
0.0000N   0.5000            3.0000   4.0000
0.0000N   0.3000            8.0000   3.0000
0.0000N   0.1000 R          3.0000   2.0000
0.0000N   0.0000N          10.0000   5.0000
          0.0000N           5.0000   1.0000
                                       22
                                     0.7000
                                     0.5000
                                     1.0000
                                     1.0000 R
                                     1.5000
```

p.2A-64

K-feldspar
Modifier

1-Monoclinic

2-Both

3-Triclinic

```
        7
0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
```

```
                        6
                        0.0000B
                        0.0000B
       27       0.0000B 0.0000B
                0.0000B 0.0000B
        0.0000B 0.0000B 0.0000B
        0.0000B 0.0000B 0.0000B
        0.0000B 0.0000B 0.0000B
        0.0000B 0.0000B 0.0000B
        0.0000B 0.0000B 0.0000B
        0.0000B 0.0000B 0.0000B
        0.0000B 0.0000B 0.0000B
        0.0000B 0.0000B 0.0000B
                          24      25
                        0.0000B 0.0000B
                        0.0000B 0.0000B
                        0.0000B 0.0000B
                        0.0000B 0.0000B
                        0.0000B 0.0000B
                        4       0.0000B
                0.0000B 0.0000B 0.0000B
                0.0000B 0.0000B 0.0000B
                0.0000B 0.0000B 0.0000B
                0.0000B 0.0000B 0.0000B
                0.0000B 0.0000B 0.0000B
                0.0000B 0.0000B
                0.0000B 0.0000B
                0.0000B 0.0000B
                        0.0000B
                        0.0000B
```

```
   3
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B     23
0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
```

```
        8
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
```

```
   29                9
0.0000B         0.0000B
0.0000B         0.0000B
0.0000B         0.0000B
0.0000B         0.0000B
0.0000B         0.0000B
0.0000B         0.0000B
0.0000B         0.0000B
0.0000B         0.0000B
0.0000B         0.0000B W
0.0000B         0.0000B
   28           0.0000B
0.0000B         0.0000B
0.0000B         0.0000B W
0.0000B         0.0000B
0.0000B         0.0000B
0.0000B         0.0000B
0.0000B         3.0000  W
0.0000B         3.0000
        5       0.0000B
0.0000B 0.0000B 0.0000B
0.0000B 0.0000B 3.0000  W
0.0000B 0.0000B 0.0000B
0.0000B 0.0000B 2.0000
0.0000B 0.0000B 2.0000 R
0.0000B 0.0000B 2.0000
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B
0.0000B
```

```
                           1                   13
                        0.0000B             0.0000B
                        0.0000B             0.0000B
                        0.0000B             2.0000
                        0.0000B             3.0000
                        0.0000B             2.0000 R
                        0.0000B             2.0000
                        0.0000B             0.0000B
                        0.0000B             3.0000
                        1.0000              3.0000
                        1.0000              2.0000
                        1.0000 R            3.0000
                        0.0000B
                        0.0000B
                        0.0000B
     10 GII             0.0000B
0.0000B                 0.0000B
0.0000B         26      0.0000B
0.0000B 0.0000B         0.0000B R
0.0000B 1.0000
0.0000B 1.0000
1.0000  0.0000B
1.0000
0.0000B                 Mono.
0.0000B                  Tri
0.0000B
0.0000B R
0.0000B
0.0000B
```

```
           32      31
        0.0000B 0.0000B
        0.0000B 0.0000B
        0.0000B 0.0000B
        0.0000B 0.0000B
   2    0.0000B
0.0000B             14
0.0000B         0.0000B
0.0000B 0.0000B         0.0000B 1.0000
0.0000B 0.0000B         0.0000B 0.0000B
0.0000B 0.0000B         0.0000B R 0.0000B
0.0000B 0.0000B         0.0000B 3.0000
0.0000B 0.0000B         3.0000  3.0000
0.0000B 0.0000B         0.0000B 0.0000B
        0.0000B         2.0000  3.0000
                        0.0000B 0.0000B
                                   22
                                0.0000B
                                0.0000B
                                0.0000B
                                0.0000B B
                                3.0000
```

p. 2A-65 (66, Plag., all N)

```
                                                    8                                                   1                 13
                                              0.0000N  1.0000                                        0.1000             0.0000N
                                              0.0000N  0.0000N                                       0.0000N            0.0000N
                                              0.0000N  0.0000N                                       0.5000             0.0000N
                                              0.0000N  0.0000N                                       1.0000             0.5000
                    Calcite %                 0.0000NR0.0000N                                        0.2000             0.5000R
                                              0.0000N  0.0000N                                       0.1000             0.0000N
                                              0.2000   0.0000N                                       0.0000N           12.0000
                                              0.0000N  0.0000N                                       0.0000N            0.0000N
                                              0.3000   0.0000NR                                      0.0000N            0.3000
                                                                                                     0.0000N            1.0000
                                                                                                     0.0000NR           0.0000N
                                                                                                     0.0000N
                                                                                                     0.3000
                                                                                                     0.0000N
                                                                                      10             0.0000N
                           0.0000N7               29               9                2.0000GH         2.2000
                           3.0000   0.0000N   4.0000W          0.0000N            1.0000     26     2.0000
                           0.7000   0.0000N   5.0000           0.0000N            0.5000   0.0000N  2.0000R
                           0.0000N  0.0000N   0.0000N          0.0000N            0.0000N  0.0000N
                           0.0000N  0.0000N   0.5000           0.0000N            7.0000   0.1000
                           0.0000NR0.0000N    1.0000W          0.2000             5.0000   2.5000
                           0.0000N  0.0000N   0.0000N          0.0000N            3.0000
                           0.0000N  0.0000N   0.1000R          0.0000N            2.0000
                           0.0000NR0.0000N    0.0000N          0.0000N            0.5000
                           0.3000   0.0000NR  0.5000R          0.0000N            0.0000N
                                              0.1000           0.0000NW           0.0000NR
                         6 0.0000NW               28           0.0000N            0.0000N
                           0.0000N            0.0000N          0.0000N            0.5000
                  0.0000NW 0.0000N            0.0000NR         0.0000NW
           27     0.5000   0.0000N            0.5000           0.0000N
         4.0000W  0.0000N  0.5000W           13.0000W          0.0000N
        11.0000   7.0000   0.5000             0.2000           0.0000N
         0.0000N  0.0000N  0.0000N            0.2000           2.0000W
         0.0000N  0.0000N  0.0000N            0.5000           0.0000N
        18.0000W  0.0000N  0.2000                    5         0.0000N                      32        31
         0.5000   0.0000N  0.0000N            4.0000W  0.0000N  0.0000N                     0.0000N  0.5000
         0.1000   0.0000N  0.5000             3.0000   0.0000N  0.0000NW                    0.0000N  0.0000N
         2.0000   0.0000N  0.0000N            0.2000   0.0000N  1.0000                      2.5000   0.0000N
                              24       25     0.1000   0.0000NR0.0000N                      2.0000R  5.0000
                           0.0000N  0.2000W   0.0000N  0.0000N  0.0000NR                    8.0000
                           0.1000   0.5000    0.0000N  0.0000N  0.0000N           2                        14
                           0.0000N  0.0000N   0.0000N  0.0000N                     0.5000            0.0000N
   3                       0.0000NR0.0000N    0.2000   0.0000NR                    0.0000N           0.0000N   0.0000N
0.0000N                    0.0000N  1.0000    0.1000R  0.0000N            0.5000   2.0000            0.0000N   0.0000N
9.0000                   4          0.7000RW  0.0000N  0.0000N            1.5000G14.0000             0.0000NR1.0000
2.5000            0.1000   0.1000   0.0000N   0.0000N                     0.0000N  4.0000            0.0000N   0.0000N
2.0000R           0.0000N  0.5000   0.1000    0.1000R                     1.0000   2.0000            0.0000N   3.0000
2.0000            0.2000   0.0000N  0.1000R                               2.0000   1.5000R           0.0000N13.0000
1.0000            0.2000   0.0000NR0.0000N                                0.0000N  0.0000N           0.0000N   0.0000N
0.0000N           0.0000N  0.2000   0.2000R                                        1.0000            0.0000N   1.0000
4.0000            0.0000N  0.0000N
0.3000      23    2.0000   0.5000                                                                                22
0.2000cp 0.1000   0.0000N  0.0000N                                                                            1.0000
0.5000   0.0000N           0.5000                                                                             1.5000
0.0000N  0.0000N           0.5000R                                                                            2.0000
0.1000   0.0000NR                                                                                             2.0000R
0.1000R  0.0000N                                                                                              2.0000
```

Dolomite %

```
                                   8                                                          1                    13
                          0.0000N 0.0000N                                            0.0000N              0.0000N
                          0.2000  0.0000N                                            0.0000N              0.0000N
                          0.0000N 0.0000N                                            0.0000N              0.0000N
                          0.0000N 0.2000                                             0.0000N              1.0000
                          0.0000NR0.1000                                             0.0000N              0.2000 R
                          0.0000N 0.0000N                                            0.2000               0.2000
                          0.0000N 0.0000N                                            0.0000N              0.3000
                          0.0000N 0.0000N                                            0.1000               0.0000N
                          0.0000N 0.0000NR                                           0.0000N              0.0000N
                                                                                     0.5000               0.0000N
                                                                                     0.5000 R             0.0000N
                                                                                     0.0000N
                                                                                     0.0000N
                                                                                     0.0000N
                    7                 29          9                   10             0.0000N
        18.0000                  25.0000 W   0.0000N              32.0000 GH         0.0000N
        35.0000 0.2000           10.0000     0.0000N              36.0000      26   22.0000
         0.0000N 0.2000           0.0000N    0.2000                9.0000 62.0000  22.0000 R
         0.0000N 2.0000           0.0000N    0.0000N               2.0000 62.0000
         0.0000N 6.0000           0.7000 W   0.0000N              76.0000  0.5000
         0.1000 R0.0000N          0.3000     0.2000               84.0000 58.0000
         0.5000  0.0000N          0.1000 R   0.0000N              86.0000
         0.0000N 0.0000N         20.0000     0.0000N              86.0000
         0.0000NR0.0000N         19.0000 R   0.2000               17.0000
         1.0000  0.0000NR         5.0000     0.0000N W            27.0000
        6                          28        0.5000               25.0000 R
        43.0000 W                 0.0000N    0.0000N              89.0000
        50.0000                   0.0000NR   0.0000N W            55.0000
 27 25.0000 W 0.0000N             0.0000N    0.5000
    15.0000   6.0000              0.5000 W   0.5000
21.0000 W 0.0000N37.0000 W        0.2000     0.0000N
18.0000   0.2000 28.0000          0.0000N    1.5000 W
 4.0000   0.0000N 0.0000N         0.0000N    0.0000N
 5.0000   0.0000N 0.0000N               5    0.0000N                      32      31
 0.0000N W0.0000N 0.2000          2.5000 W0.2000   0.1000           0.0000N 0.0000N
 0.0000N  0.0000N 7.0000         20.0000  0.0000N  0.0000N W        0.0000N 0.0000N
 0.5000   0.2000  5.0000          0.0000N 0.5000   0.0000N          0.0000N 0.0000N
14.0000   0.2000  0.5000          0.0000N 0.2000 R 0.0000N          0.0000NR0.0000N
                  24     25       0.0000N 0.1000   0.0000NR        90.0000
                 0.5000 11.0000 W 0.0000N 0.1000   0.2000          2                    14
                 0.0000N13.0000   0.0000N 0.0000N                 24.0000         0.3000
  3              0.5000  0.0000N  0.0000N 0.0000NR                21.0000         0.2000  0.0000N
0.0000N          0.0000NR0.0000N  0.0000NR0.0000N         6.5000  36.0000         0.0000N16.0000
0.0000N          0.0000N 5.0000   0.0000N 0.0000N         2.0000 =d13.0000        0.0000NR0.0000N
0.0000N           4      4.5000 RW 0.0000N                37.0000 27.0000         0.3000  0.1000
0.0000NR  0.1000 0.0000N 0.0000N  0.0000NR                23.0000 44.0000         0.0000N 0.0000N
0.0000N   0.0000N 0.0000N 0.0000N                         68.0000 44.0000 R       0.0000N 0.0000N
0.0000N  10.0000 0.0000N 0.0000NR                         46.0000  0.0000N        0.0000N 0.5000
0.0000N   0.0000N 0.0000NR16.0000                                  0.0000N        0.0000N 1.0000
0.0000N   0.0000N 0.0000N15.0000 R                                                          22
0.0000N CD  23    0.0000N 0.0000N                                                      26.0000
0.1000  0.0000N   2.0000  0.0000N                                                      41.0000
0.0000N 0.3000    0.0000N 0.0000N                                                      47.0000
0.0000N 0.0000N           0.3000                                                       46.0000 R
0.0000N 0.0000NR          0.3000 R                                                     57.0000
0.0000NR0.0000N
```

[illegible]

Gibk Canyon

p.2A-68

Hematite %

```
                                    7
                                 0.0000N
                                 0.0000N    0.0000N
                                 0.0000N    0.0000N
                                 0.0000N    0.0000N
                                 0.0000N    0.0000N
                                 0.0000NR   0.0000N
                                 0.0000N    0.0000N
                                 0.0000N    0.0000N
                                 0.0000NR   0.0000N
                                 0.0000N    0.0000NR
                                6
                                 0.0000N W
                                 0.0000N
                      0.3000   W 0.0000N
                27    0.0000N W  0.0000N
           0.1000   W 0.0000N    0.0000N W
           0.0000N W  0.0000N    0.2000
           0.0000N    0.0000N    0.0000N
           0.0000N    0.0000N    0.0000N
           0.0000N N  0.0000N    0.0000N
           0.0000N    0.0000N    0.0000N
           0.0000N    0.0000N    0.0000N
           0.0000N    0.0000N    0.0000N
                                    24         25
                                 0.1000     0.0000N W
                                 0.0000N    0.0000N
                                 0.0000N    0.0000N
     3                           0.0000NR   0.0000N
0.0000N                          0.0000N    0.0000N
0.0000N                         4           0.0000NRW
0.3000                0.0000N    0.0000N    0.0000N /
0.2000 R              0.0000N    0.0000N    0.0000N
0.0000N               0.0000N    0.0000N    0.0000NR
0.0000N               0.0000N    0.0000NR   0.0000N
0.0000N               0.0000N    0.0000N    0.0000NR
0.0000N               0.0000N    0.0000N
0.0000N CB     23     0.0000N    0.0000N
0.0000N    0.0000N    0.0000N    0.0000N
0.0000N    0.0000N               0.0000N
0.0000N    0.0000N               0.0000NR
0.0000N    0.0000N
0.0000N    0.0000N
```

```
         8
0.0000N    0.0000N
0.0000N    0.0000N
0.0000N    0.0000N
0.0000N    0.0000N
0.0000NR   0.0000N
0.0000N    0.0000N
0.0000N    0.0000N
0.0000N    0.0000N
0.0000N    0.0000NR
```

```
   29                      9
0.0000N W             0.0000N
0.0000N               0.0000N
0.0000N               0.1000
0.0000N               0.0000N
0.0000N               0.0000N
0.0000N W             0.0000N
0.0000NR              0.0000N
0.0000N               0.0000N
0.0000NR              0.7000
0.0000N               0.0000N W
   28                 0.0000N
0.0000N               0.0000N
0.0000NR              1.0000
0.0000N               1.5000  W
0.5000                0.0000N
0.0000N W             0.0000N
0.0000N               0.0000N W
0.0000N               2.0000
          5           0.0000N
0.0000N W  0.0000N    0.0000N
0.0000N    0.0000N    1.0000  W
0.0000N    0.0000N    0.2000
0.0000N    0.0000NR   0.0000N
0.0000N    0.0000N    0.0000NR
0.0000N    0.0000N    0.0000N
0.0000N    0.0000N
0.0500     0.0000NR
0.0500   R 0.0000N
0.0000N    0.0000N
0.0000N
0.0000NR
```

```
                         1                                  13
                      0.0000N                            0.0000N
                      0.0000N                            0.1000
                      0.0000N                            0.0000N
                      0.0000N                            0.0000N
                      0.0000N                            0.0000NR
                      0.0000N                            0.0000N
                      0.0000N                            0.0000N
                      0.0000N                            0.0000N
                      0.0000N                            0.0000N
                      0.5000                             0.0000N
                      0.3000  R                          0.0000N
                      0.0000N
                      0.2000
   10                 0.2000
                      0.0000N
0.0000N GH            0.2000
0.0000N       26      0.3000
0.0000N    0.0000N    0.3000 R
0.0000N    1.0000
1.5000     0.0000N
0.7000     0.0000N
1.5000
1.0000
0.0000N
0.0000N
0.0000NR
1.5000
2.0000
```

```
                        32         31
                      0.0000N    0.0000N
                      0.0000N    0.0000N
                      0.0000N    0.0000N
                      0.0000NR   0.0000N
                      0.0000N
            2                           14
           0.0000N               0.0000N
           0.0000N               0.0000N    0.7000
0.0000N    0.0000N               0.0000N    0.2000
0.0000N G  0.0000N               0.0000NR   1.0000
0.0500     0.0000N               0.0000N    0.0000N
0.0000N    0.0000N               0.0000N    0.0000N
0.0000N    0.0000NR              0.0000N    0.0000N
0.0500     0.0000N               0.0000N    0.3000
           0.0000N               0.0000N    0.0000N
                                              22
                                            0.0000N
                                            0.0000N
                                            0.0000N
                                            0.0000N
                                            0.0000N
```

Goethite %

```
                                                        8                                               1                       13
                                                0.2000  0.0000N                                         0.0000N                 0.0000N
                                                0.0000N 0.0000N                                         0.0500                  0.1000
                                                0.0000N 0.0000N                                         0.0000N                 0.5000
                                                0.0000N 0.0000N                                         0.0000N                 0.5000
                                                0.0000NR0.0000N                                         0.0000N                 0.5000R
                                                0.0000N 0.0000N                                         0.0000N                 0.5000
                                                0.0000N 0.0000N                                         0.0000N                 2.0000
                                                0.0000N 0.0000N                                         0.0000N                 0.1000
                                                0.0000N 0.0000NR                                        0.0000N                 2.0000
                                                                                                        0.0000N                 0.3000
                                                                                                        0.0000N                 0.7000
                                                                                                        0.0000N
                                                                                                        0.0000N
                                                                                                        0.0000N
                        7                                                       10              0.0000N
                        0.0000N                 29              9               0.3000 4"       0.0000N
                        0.0000N 0.0000N         0.5000W         0.0000N         0.3000  26      0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N         0.0000N 0.0000N 0.0000N
                        0.0000N 0.0000N         0.0000N         0.0000N         0.0000N 0.0000N
                        0.0000N 0.0000N         0.0000N         0.5000          0.0000N 0.0000N
                        0.0000N 0.0000N         0.0000N         0.1000          0.0000N 0.0000N
                        0.0000N 0.0000N         0.0000NW        0.0000N         0.0000N
                        0.0000N 0.0000N         0.0000NR        0.0000N         0.0000N
                        0.0000N 0.0000N         0.1000          0.0000N         0.0000N
                        0.0000N 0.0000N         0.0000NR        0.0000N         0.1000
                                                0.0000N         0.1000W         0.1500R
                       60.2000                  28              0.2000          0.0000N
                        0.0000NW                0.0000N         0.0000N         0.0000N
                0.0000NW0.0000N                 0.0000NR        0.0000N
        27      0.0000N 0.0000N                 0.0000N         0.0000NW
        0.2000  0.0000N 0.0000N                 0.0000N         1.0000
        0.2000W 0.0000N 0.3000W                 0.2000W         0.3000
        0.0000N 0.0000N 0.2000                  0.0000N         0.0000N
        0.0000N 0.0000N 0.0000N                 0.0000N         0.0000NW
        0.3000  0.0000N 0.0000N                         5       0.0000N                 32      31
        0.2000W 0.0000N 0.0000N                 0.7000W 0.0000N 0.0000N                 0.0000N 0.0000N
        0.0000N 0.0000N 0.0000N                 0.7000  0.0000N 0.0000N                 0.0000N 0.2000
        0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N 0.0000NW                0.0000N 0.0000N
                        24      25              0.0000N 0.0000NR0.0000N                 0.0000NR0.0000N
                        0.0000N 0.0000NW        0.0000N 0.0000N 0.0000NR                0.7000
                        0.0000N 0.0000N         0.0000N 0.0000N 0.0000N         2               14
3                       0.0000N 0.0000N         0.0000N 0.0000N                 0.0000N         0.0000N
                        0.0000N 0.0000N         0.0000N 0.0000NR                0.0000N         0.0000N 0.0000N
0.0000N                 0.0000N 0.0000N         0.0000NR0.0000N         0.0000N 0.0000N         0.0000N 0.0000N
0.0000N                 4       0.0000NW        0.0000N 0.0000N         0.0000N 0.0000N         0.0000NR2.0000
0.0000N         0.0000N 0.0000N 0.0000N         0.0000N                 0.0000N 0.0000N         0.1000  0.0000N
0.0000NR        0.0000N 0.0000N 0.0000N         0.0000NR                0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000NR                                0.7000  0.0000NR        0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000N                                 0.1000  0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N 0.0000NR                                        0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N
0.0000N 23      0.0000N 0.0000N                                                                                 22
0.0000Nco0.0000N 0.0000N 0.0000N                                                                                0.0000N
0.0000N 0.0000N         0.0000N                                                                                 0.1000
0.0000N 0.0000N         0.0000N                                                                                 0.7000
0.0000N 0.0000NR                                                                                                0.5000R
0.0000NR0.0000N                                                                                                 0.0000N
```

p. 2A-70

Anatase %

```
                                                                                                                     1                          13
                                                      0.0000N  0.0000N                                               0.0700                     0.0000N
                                                      0.0000N  0.0000N                                               0.0500                     0.0000N
                                                      0.0000N  0.0000N                                               0.1000                     0.0000N
                                                      0.0000N  0.0000N                                               0.0500                     0.2000
                                                      0.0000N  0.0000N                                               0.0500                     0.2000 R
                                                      0.0000N  0.0000N                                               0.0500                     0.2000
                                                      0.0000N  0.0000N                                               0.0500                     0.1000
                                                      0.0000N  0.0000N                                               0.1000                     0.3000
                                                      0.0000N  0.0000N                                               0.0500                     0.0000N
                                                                                                                     0.1000                     0.2000
                                                                                                                     0.1000 R                   0.1000
                                                                                                                     0.0500
                                                                                                                     0.0500
                                                                                                                     0.0500
                                                                                                                     0.0000N
                                                                                                   10
                           0.0000N                                                                 0.0300            0.0000N
                                                                        9
                           0.0000N  0.0000N                   0.0000N           0.0000N            0.0000N           0.0500
                                                                                                            26
                           0.0000N  0.0000N                   0.0000N           0.0000N            0.0000N  0.0000N  0.0500 R
                           0.0000N  0.0000N                   0.0000N           0.0000N            0.0000N  0.0000N
                           0.0000N  0.0000N                   0.0000N           0.0000N            0.0000N  0.0500
                           0.0000N  0.0000N                   0.0000N           0.0000N            0.0000N  0.0000N
                           0.0000N  0.0000N                   0.0000N           0.0000N            0.0000N
                           0.0000N  0.0000N                   0.0000N           0.0000N            0.0000N
                           0.0000N  0.0000N                   0.0000N           0.0000N            0.0000N
                           0.0000N  0.0000N                   0.0000N           0.0000NW           0.0300
                                                              0.0000N           0.0000N            0.0300 R
                           6
                           0.0300 W                                             0.0000N            0.0000N
                           0.0200                             0.0000N           0.0000N            0.0000N
                  0.0000NW 0.0000N                            0.0000N           0.0500
                  0.0000N  0.0000N                            0.0000N           0.0000NW
         0.0000N  0.0000N  0.0000NW                           0.0000N           0.0000N
         0.0000N  0.0000N  0.0500                             0.0000N           0.0000N
         0.0000N  0.0000N  0.0000N                            0.0000N           0.0000N
         0.0000N  0.0000N  0.0000N                            0.0000N           0.0000NW
                                                                                                            32       31
         0.0000N  0.0000N  0.0000N                                              0.0000N
         0.0000N  0.0000N  0.0000N                            0.0000N  0.0000N  0.0000N                     0.0000N  0.0500
         0.0000N  0.0000N  0.0000N                            0.0000N  0.0000N  0.0000NW                    0.0500   0.0000N
         0.0000N  0.0000N  0.0000N                            0.0000N  0.0000N  0.0000N                     0.0000N  0.0000N
                                                              0.0000N  0.0000N  0.0000N                     0.0000NR 0.0000N
                           0.0000N  0.0000N                   0.0000N  0.0000N  0.0000NR                    0.0000N
                           0.0000N  0.0000N                   0.0000N  0.0000N  0.0000N
                                                                                                   2                 14
                           0.0000N  0.0000N                   0.0000N  0.0000N                     0.0000N           0.0000N
                           0.0000N  0.0000N                   0.0000N  0.0000N                     0.0000N           0.0000N  0.5000
0.0000N                    0.0000N  0.0000N                   0.0000N  0.0000N                     0.0000N  0.0000N           0.0000N  0.1000
0.0000N                             0.0000N                   0.0000N  0.0000N                     0.0000N  0.0000N           0.0000NR 0.0000N
0.0000N           0.0000N  0.0000N  0.0000N                   0.0000N                              0.0000N  0.0000N           0.0500   0.1000
0.0000N           0.0000N  0.0000N  0.0000N                   0.0000N                              0.0000N  0.0000N           0.0000N  0.1000
0.0000N           0.0000N  0.0000N  0.0000N                                                        0.0000N  0.0000NR          0.0000N  0.2000
0.0000N           0.0000N  0.0000N  0.0000N                                                        0.0000N  0.0000N           0.0000N  0.2000
0.0000N           0.0000N  0.0000N  0.0000N                                                                 0.0000N           0.0000N  0.3000
0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N
                                                                                                                              22
0.0000N  0.0000N  0.0000N  0.0000N                                                                                            0.0000N
0.0000N  0.0000N           0.0000N                                                                                            0.0000N
0.0000N  0.0000N           0.0000N                                                                                            0.0500
0.0000N  0.0000N                                                                                                              0.0000NR
0.0000N  0.000CN                                                                                                              0.0000N
```

p.2A-71

Hornblende %

```
                                                  0.0000N   0.0000N                                           0.0000N             0.0000N
                                                  0.0000N   0.0000N                                           0.0000N             0.0000N
                                                  0.0000N   0.0000N                                           0.0000N             0.0000N
                                                  0.0000N   0.0000N                                           0.0000N             0.0000N
                                                  0.0000N   0.0000N                                           0.0000N             0.0000N
                                                  0.0000N   0.0000N                                           0.0000N             0.0000N
                                                  0.0000N   0.0000N                                           0.0000N             0.0000N
                                                  0.0000N   0.0000N                                           0.0000N             0.0000N
                                                 .0.0000N   0.0000N                                           0.0000N             0.0000N
                                                                                                              0.0000N             0.0000N
                                                                                                              0.0000N             0.0000N
                                                                                                              0.0000N
                                                                                                              0.0000N
                                                                                                              0.0000N
                                                                                                              0.0000N
                              0.0000N                                                     0.0000N             0.0000N
                              0.0000N   0.0000N   0.0000N             0.0000N             0.0000N             0.0000N
                              0.0000N   0.0000N   0.0000N             0.0000N             0.0000N   0.0000N   0.0000N
                              0.0000N   0.0000N   0.0000N             0.0000N             0.0000N   0.0000N
                              0.0000N   0.0000N   0.0000N             0.0000N             0.0000N   0.0000N
                              0.0000N   0.0000N   0.0000N             0.0000N             0.0000N   0.0000N
                              0.0000N   0.0000N   0.0000N             0.0000N             0.0000N
                              0.0000N   0.0000N   0.0000N             0.0000N             0.0000N
                              0.0000N   0.0000N   0.0000N             0.0000N             0.0000N
                              0.0000N   0.0000N   0.0000N             0.0000N             0.0000N
                                                  0.0000N             0.0000N             0.0000N
                              0.0000N                                 0.0000N             0.0000N
                              0.0000N             0.0000N             0.0000N             0.0000N
                    0.0000N   0.0000N             0.0000N             0.0000N
                    0.0000N   0.0000N             0.0000N             0.0000N
          0.0000N   0.0000N   0.0000N             0.0000N             0.0000N
          0.0000N   0.0000N   0.0000N             0.0000N             0.0000N
          0.0000N   0.0000N   0.0000N             0.0000N             0.0000N
          0.0000N   0.0000N   0.0000N             0.0000N             0.0000N
          0.0000N   0.0000N   0.0000N                                 0.0000N
          0.0000N   0.0000N   0.0000N             0.0000N   0.0000N   0.0000N                       0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N             0.0000N   0.0000N   0.0000N                       0.0000N   0.0000N
          0.0000N   0.0000N   0.0000N             0.0000N   0.0000N   0.0000N                       0.0000N   0.0000N
                                                  0.0000N   0.0000N   0.0000N                       0.0000N   0.0000N
                              0.0000N   0.0000N   0.0000N   0.0000N   0.0000N                       0.0000N
                              0.0000N   0.0000N   0.0000N   0.0000N   0.0000N
  3                           0.0000N   0.0000N   0.0000N   0.0000N                       0.0000N             0.0000N
                              0.0000N   0.0000N   0.0000N   0.0000N                       0.0000N             0.0000N   0.0000N
0.0000N                       0.0000N   0.0000N   0.0000N   0.0000N             0.0000N   0.0000N             0.0000N   0.0000N
10.0000                                 0.0000N   0.0000N   0.0000N             0.0000N   0.0000N             0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000N   0.0000N                       0.0000N   0.0000N             0.0000N   0.0000N
0.0000NR            0.0000N   0.0000N   0.0000N   0.0000N                       0.0000N   0.0000N             0.0000N   0.0000N
0.5000              0.0000N   0.0000N   0.0000N                                 0.0000N   0.0000N             0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000N                                 0.0000N   0.0000N             0.0000N   0.0000N
0.0000N             0.0000N   0.0000N   0.0000N                                           0.0000N             0.0000N   0.0000N
2.0000              0.0000N   0.0000N
0.0000Na            0.0000N   0.0000N
0.0000N   0.0000N   0.0000N   0.0000N                                                                                   0.0000N
0.0000N   0.0000N             0.0000N                                                                                   0.0000N
0.0000N   0.0000N             0.0000N                                                                                   0.0000N
0.0000N   0.0000N                                                                                                       0.0000N
0.0000N   0.0000N                                                                                                       0.0000N
```

Apatite %

8
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

1
```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.5000 B
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
```

13
```
0.0000N
0.2000
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

7
```
0.0000N
1.0000  0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

27, 6
```
                  0.0000N
                  0.0000N W
         0.0000N W 0.0000N
         0.0000N W 0.0000N
0.0000N  0.0000N   0.0000N
0.0000N W 0.0000N  0.0000N W
0.0000N  0.0000N   0.0000N
0.0000N  0.0000N   0.0000N
0.0000N  0.0000N   0.0000N
0.0000N W 0.0000N  0.0000N
0.0000N  0.0000N   0.0000N
0.0000N  0.0000N   0.0000N
```

24, 25, 4
```
         0.0000N 0.0000N
         0.0000N 0.0000N W
         0.0000N 0.0000N
         0.0000N 0.0000N
         0.0000N 0.0000N\
                 0.0000NR W
0.0000N  0.0000N 0.0000N /
0.0000N  0.0000N 0.0000N
0.0000N  0.0000N 0.0000NR
0.0000N  0.0000N 0.0000N
0.0000N  0.0000N 0.0000NR
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
         0.0000N
         0.0000N
```

3, 23
```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

29
```
0.0000N
0.0000N W
0.0000N
0.0000N
0.0000N\
0.0000N W
0.0000NR
0.0000N
0.0000N
0.0000N
```

28
```
0.0000N
0.0000NR
0.0000N
0.7000
0.0000N W
0.0000N
0.0000N
```

5
```
0.0000N   0.0000N
0.0000N W 0.0000N
0.0000N   0.0000N15.5000
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000N   0.0000N
0.0000NR  0.0000N
0.0000N   0.0000N
0.0000N
0.0000NR
```

9
```
0.0000N
0.0000N
0.5000
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N W
0.0000N
0.0000N
5.5000
6.0000 W
0.5000
0.0000N
0.7000
1.0000 W
0.0000N
0.0000N
1.0000 W
5.5000
0.5000
0.5000 R
1.0000
```

10, 26
```
0.0000N GH
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.2000  0.0000N
0.0000N
0.5000
0.0000N
0.0000N
0.0000NR
0.0000N
0.5000
```

32, 31
```
0.2000    0.0000N
0.7000    5.5000
0.0000N   0.0000N
0.5000 R  0.0000N
0.0000N
```

2
```
        0.0000N
        0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
1.0000  0.0000NR
0.0000N 0.0000N
        0.0000N
```

14
```
1.5000
0.0000N  0.0000N
0.7000   0.0000N
0.7000 R 0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
7.0000   0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
```

22
```
2.0000
2.0000
0.0000N
0.0000NR
0.0000N
```

p. 2A-73 (74, Pyrite, all N)

Shale sample numbers

8G-H
08HHL
08HHLR
08HHU
08GHL
08GHU
08GHUR

7G
07GHL
07GHU

3E-H
03HHL
03HHU
03GHL
03GHU
03FHL
03FHU
03FHUR
03EHL
03EHU
03EHUR

9B
09BHL
09BHU

10C
10CHL
10CHLR
10CHU
10CHUR

31
31CHL
31CHU
31AHL
31AHU

14A-D
14DHL
14DHLR
14DHU C
14BHL
14BHU
14AHL
14AHU
14AHUR

13
13EHL
13EHJ
13DHL
13DHLR
13DHU
13CHL
13CHU
13CHUR B
13AHU
13AHL

SiO2 %

8G-H
55.9900
56.9700
89.0600
77.3600
87.1200
81.7900

13
47.6400
47.4900
50.3500
47.0600
48.5200
51.8300
50.5800
48.2500
49.3500
50.6200

7G
22.2700
79.1100

10C
46.1700
47.7300
50.3500
51.6600

9B
64.9900
58.3800

3E-H
39.2200
58.1100
73.2900
65.4700
38.9000
47.8000
47.0200
61.1700
24.7500
23.7400

31
60.2800
63.1600
34.7000
30.3100

14A-D
63.2700
63.1900
46.1500
77.5800
58.0700
44.7100
70.3300
63.6800

p. 2B-2

Al2O3 %

8G-H
16.6000
18.0000
3.0300
4.8750
2.7590
2.4240

13
22.0300
23.8000
20.5200
17.6000
22.3900
22.4300
23.2500
20.7300
23.7900
19.3400

7G
5.2460
6.5960

10C
10.8900
12.1000
10.0000
8.2810

9B
13.7900
18.1500

3E-H
9.0320
15.1700
8.4340
8.0690
0.9265
1.3360
2.0880
12.9700
0.8976
1.1570R

31
14.0600
11.7100
5.9140
7.0140

14A-D
10.2100
9.6120R
20.2300
3.5910
14.7400
18.3400
10.9400
11.6100

p. 2B-3

Fe2O3 %

8GH
3.4170
3.2080
0.0500
0.4865
0.0975
0.1228

13
4.7570
4.2320
5.0150
5.0190R
4.7070
3.9310
3.3940
3.5810
4.1140
3.3770

7G
2.9830
1.8500

10C
3.6110
3.5560R
1.1510
1.1960R

9B
3.6630
3.9060

31
2.7770
5.0240
2.3160
2.7220

3E-H
2.3150
2.1140
0.9083
1.2100
19.7800
4.7000
4.5320R
3.1700
3.9660
3.7560R

14A-D
2.3870
2.4190R
5.5680
1.3570
5.8060
5.4360
3.0450
3.0260R

p. 2B-4

MgO %

8GH
2.0000
2.0000R
0.4100
0.3800
0.2800
0.2800R

13
1.7100
1.6400
1.6400
1.6300R
1.8900
1.5400
1.6400
1.6000R B
1.8000
1.5300

7G
2.5800
0.7300

10C
5.8400
5.8100R
6.2600
6.3400R

9B
1.2400
1.4500

3E-H
13.8000
5.7300
2.8300
2.8100
5.1300
9.2500
9.1800R
2.5900
8.8000
4.4500R

31
2.2000
1.6600
12.5000
13.1000

14A-D
1.2100
1.1900
2.9600
0.7500
1.8400
2.3100
0.9900
0.9600

P 2B-5

CaO %

8GH
0.2443
0.2610R
0.0700
0.0200
0.2531
0.2886R

13
0.3698
0.6786
1.4180
1.3730R
1.7330
0.6236
0.3820
0.3686R B
0.4679
0.3523

7G
31.9900
0.1651

10C
7.2240
7.2950R
8.7210
8.7120R

9B
0.4481
0.4740

3E-H
13.1600
0.7090
0.9059
1.5610
21.3500
23.3300
23.2100R
0.2613
32.2100
31.2800R

31
0.6726
1.9250
13.1800
13.5100

14A·D
0.8087
0.8527R
0.7355 C
0.0700
0.1290
2.3850
0.1425
0.1706R

p. 2B-6

Na2O %

8GH
0.0700
0.0600
0.0500
0.0200
0.0400
0.0400

13
0.2400
0.0900
0.1300
0.1300R
0.1200
0.1600
0.1500
0.1800R 3
0.1300
0.1000

7G
0.0500
0.0200

10C
0.0700
0.0700R
0.1000
0.1300R

9B
0.0800
0.1100

31
0.2200
0.1700
0.1100
0.0800

3E-H
0.2400
0.1600
0.1600
0.1800
0.1500
0.0300
0.0300R
0.0800
0.0600
0.0600R

14A-D
0.0700
0.0800R
0.1400 C
0.1000
0.1400
0.1000
0.1200
0.0900R

K2O %

8G·H
6.9870
6.8430 R
1.0830
1.2990
0.7386
0.6988 R

13
7.3480
6.7470
6.4050
6.2610 R
6.7080
6.1950
6.6470
6.5690 E
6.9550 B
5.5640

7G
2.0230
1.7360

10C
5.6300
5.6480 R
5.1030
5.2250 R

9B
6.1810
7.3500

3E-H
3.8950
4.8710
4.2200
4.9420
0.1653
0.0300L
0.0300LR
3.8330
0.0300L
0.0300LR

31
6.7530
5.1060
4.3240
4.4740

14A·D
5.4450
5.4090 R
7.5630
1.3840 C
5.7720
6.5470
4.3310
4.2720 R

p.2B-8

TiO2 %

8 G-H
0.9844
0.9691R
0.1739
0.3521
0.1951
0.1745R

13
0.8168
0.7047
0.8560
0.8055R
0.7587
0.7678
0.7934
0.8241R
0.7571
0.7526

7G
0.2218
0.3123

10 C
0.4759
0.4634R
0.4200
0.3829R

9B
0.5606
0.7010

31
0.6689
0.6554
0.1878
0.2397

3E 11
0.5071
0.7954
0.4460
0.4733
0.0500
0.1050
0.0921R
0.7746
0.0899
0.0882R

14A-D
0.6134
0.6120R
0.8888
0.1457
1.5220
0.9998
1.2030
1.2380R

p 2B-9 (10, P_2O_5, all L 1.0)

F %

8GH
0.0900
0.1700R
0.0500
0.0400L
0.0400L
0.0400LR

13
0.2000
0.1400
0.1900
0.1800R
0.2200
0.1000
0.0900
0.1100R B
0.1100
0.1900

7G
0.1600
0.0600

10C
0.1500
0.1500R
0.1200
0.1400R

9B
0.1100
0.1200

3E-H
0.0900
0.1700
0.1200
0.1600
0.0400L
0.0400L
0.0400LR
0.0500
0.1100
0.0900R

31
0.3500
0.3300
0.4000
0.4700

14A-D
0.1100
0.1200R
0.2300 C
0.0400
0.1900
0.2500
0.1300
0.0900R

p.2B-11

Total S %

8G H
0.1432
0.0801LR
0.0801L
0.0801L
0.0801L
0.0801LR

13
0.0801L
0.0801L
0.0805
0.1139 R
0.0801L
0.0801L
0.0801L
0.1034 R a
0.0916
0.2248

7G
0.0801L
0.0801L

10C
0.0801L
0.0801LR
0.0801L
0.0801LR

9B
0.0801L
0.0801L

3E H
0.0801L
0.0801L
0.0801L
0.0801L
0.0801L
0.0801L
0.0801LR
0.0801L
0.0801L
0.0801LR

31
0.0801L
0.0801L
0.0801L
0.0801L

14A-D
0.0801L
0.0801LR
0.0801L
0.0801L c
0.0801L
0.1113
0.0801L
0.0801LR

Total C %

8GH
0.7200
0.6900R
0.4500
1.0700
0.7500
0.7800R

13
0.1500
0.3300
0.2900
0.3300R
0.2500
0.2700
0.2600
0.2600R B
0.1700
0.4500

7G
7.3700
0.4900

10C
2.9500
2.9700R
3.4800
3.4700R

9B
0.1700
0.1400

3E-H
2.7300
3.2900
0.3800
0.5300
1.9900
2.6500
2.6700R
0.1900
6.6100
6.5000R

31
0.2000
0.3500
4.8100
4.8000

14A-D
0.2000
0.2000R
0.3600 C
0.1800
0.1900
0.3500
0.1700
0.1700R

Organic C %

8GH
0.7200
0.6900R
0.4500
0.9800
0.7500
0.7800R

13
0.1500
0.3300
0.2900
0.3300R
0.2500
0.2700
0.2600
0.2600R B
0.1700
0.4100

7G
0.5600
0.4900

10C
0.3700
0.4000R
0.5200
0.5200R

9B
0.1700
0.1400

3E-H
0.3800
→ 3.2900
0.3800
0.5000
0.0300
0.6700
0.6500R
0.1200
0.3600
0.2900R

31
0.2000
0.3500
0.3800
0.1300

14A-D
0.1300
0.1300R
0.3600 C
0.1000
0.1900
0.2800
0.1700
0.1700R

Carbonate C %

8G-H
0.0000B
0.0000BR
0.0000B
0.0900
0.0000B
0.0000BR

13
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B B
0.0400

7G
6.8100
0.0000B

10C
2.5800
2.5700R
2.8600
2.8500R

9B
0.0000B
0.0000B

31
0.0000B
0.0000B
4.4300
4.6700

3E-H
2.3500
0.0000B
0.0000B
0.0300
1.9600
1.9800
2.0200R
0.0700
6.2500
6.2100R

14A-D
0.0700
0.0700R
0.0000B C
0.0800
0.0000B
0.0700
0.0000B
0.0000BR

Ag ppm

8G-H
.0000N
.0000NR
.0000N
.0000N
.0000
.0000

13
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

7G
0.0000N
0.0000N

10C
0.0000N
0.0000N
0.0000N
0.0000N

9B
0.0000N
0.0000N

3E-H
0.0000N
0.0000N
0.0000N
→ 1.0000
0.0000N
0.0000N
0.0000NR
→ 1.5000
0.0000N
0.0000NR

31
0.0000N
0.0000N
0.0000N
0.0000N

14A-D
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

As ppm

8G-H
8.0020
8.7120R
8.7840
5.9230
3.8900
4.4430R

13
5.6980
4.1070
1.4880
5.9220R
3.0110
4.6310
1.2570
2.1210R P
0.6258
4.7220

7G
15.9700
22.5000

10C
2.8880
2.4780R
3.1520
5.5730R

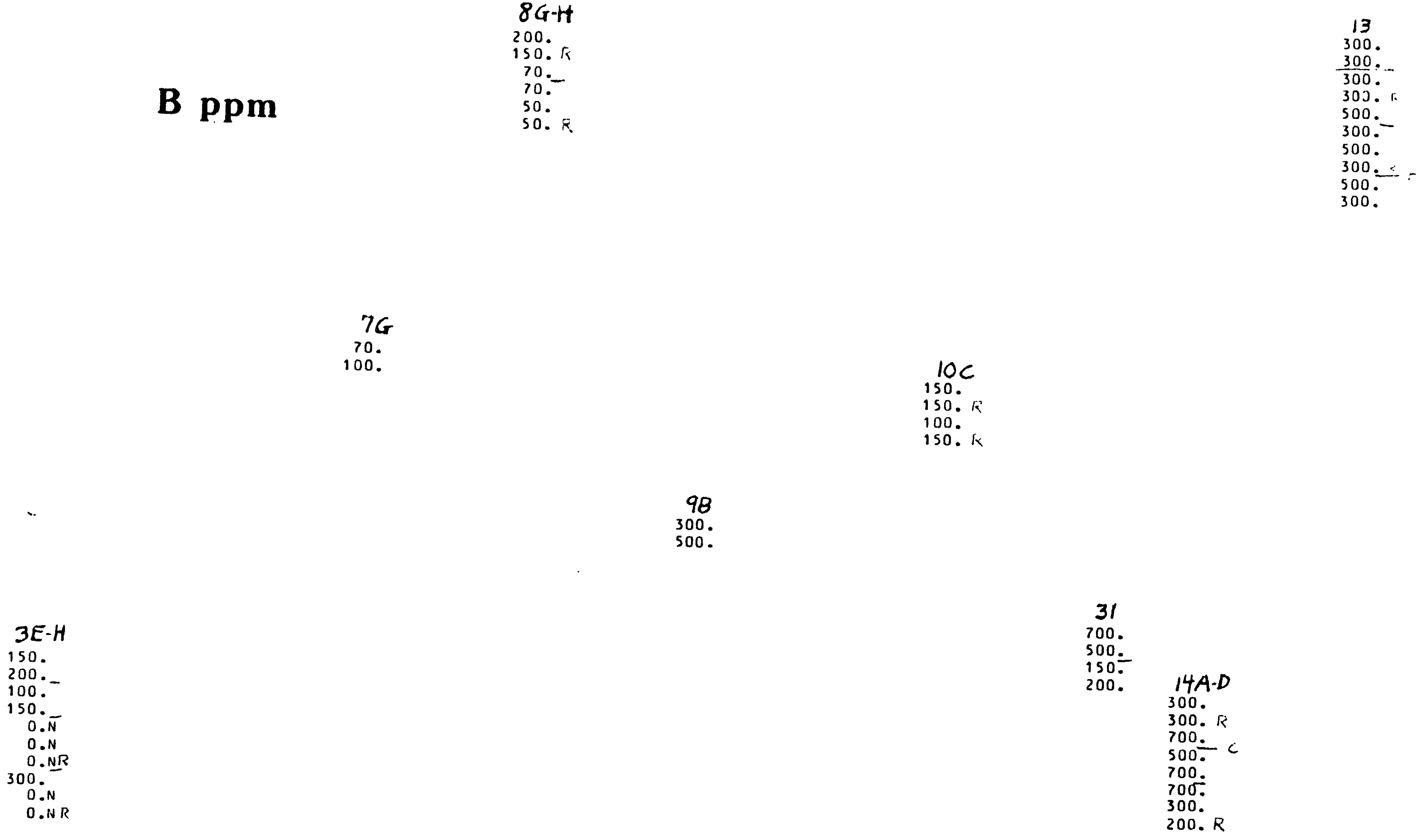
9B
0.6842
0.1249

3E-H
5.6980
6.3240
4.1640
10.8300
3.6320
1.0650
0.5426R
11.0500
9.0400
6.3200R

31
34.4000
6.4930
1.8270
1.0770

14A-D
2.4050
3.0570R
2.1150
3.7780 C
6.5320
4.5030
6.7310
7.7340R

B ppm


8G-H
200.
150. R
70.
70.
50.
50. R
13
300.
300.
300.
300. R
500.
300.
500.
300.
500.
300.
7G
70.
100.
10C
150.
150. R
100.
150. R
9B
300.
500.
3E-H
150.
200.
100.
150.
0.N
0.N
0.NR
300.
0.N
0.NR
31
700.
500.
150.
200.
14A-D
300.
300. R
700.
500. C
700.
700.
300.
200. R

P. 2B-18

Ba ppm

8G-H
500.
700.R
300.
2000.
1500.
1000.R

13
300.
300.
300.
300.R
300.
500.
500.
300.R -R
300.
200.

7G
300.
700.

10C
300.
300.R
300.
300.R

9B
700.
700.

3E-H
1500.
1000.
1000.
700.
15.
100.
100.R
300.
30.
30.R

31
200.
300.
100.
70.

14A-D
200.
200.R
300.
30. c
500.
300.
700.
500.R

Be ppm

8GH
3.0000
3.0000 R
1.5000
0.0000N
0.0000N
0.0000NR

13
3.0000
3.0000
2.0000
2.0000 R
3.0000
2.0000
2.0000
3.0000 R B
2.0000
5.0000

7G
0.0000N
2.0000

10C
2.0000
2.0000 R
0.0000N
1.5000 R

9B
2.0000
5.0000

3E-H
1.5000
1.5000
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
2.0000
0.0000N
0.0000NR

31
10.0000
10.0000
0.0000N
0.0000N

14A-D
2.0000
3.0000 R
3.0000 C
3.0000
5.0000
3.0000
5.0000
3.0000 R

Br ppm

8GH
0.5000L
0.5000LR
0.5000L
0.5000L
0.5000L
0.5000LR

13
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000LR
0.5000L
0.5000L

7G
0.5000L
0.5000L

10C
1.0910
1.0000R
0.0000B
0.0000BR

9B
0.5000L
0.5000L

3E-H
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000LR
0.5000L
0.5000L
0.5000LR

31
0.6212
0.5000L
0.7799
0.5252

14A-D
0.5000L
0.5000LR
0.5000L c
4.3530
0.5000L
0.5000L
0.5000L
0.5000LR

Cd ppm

8G-H
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000B
0.0000BR

13
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B

7G
0.0000B
0.0000B

10C
0.0000B
0.0000BR
0.0000B
0.0000BR

9B
0.0000B
0.0000B

3E-H
0.0000B
→ 1.0000L
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000BR

31
0.0000B
0.0000B
0.0000B
0.0000B

14A-D
0.0000B
0.0000BR
→ 1.0000L
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR

Co ppm

8G-H
5.
5.LR
0.N
0.N
0.N
0.NR

13
10.
15.
30.
30. R
20.
30.
10.
10.R
15.
7.

7G
5.
5.

10C
5.
5. R
5.
5. R

9B
5.
7.

3E-H
7.
0.N
0.N
0.N
100.
30.
10. R
10.
0.N
0.NR

31
15.
15.
5.
5.

14A-D
10.
15. R
30. C
5.
15.
20.
15.
10. R

Cr ppm

8G-H
150.
150.R
30.
50.
30.
20.R

13
100.
150.
100.
100.R
100.
150.
150.
150.R G
150.
150.

7G
30.
50.

10C
70.
70.R
70.
70.R

9B
70.
100.

31
100.
100.
30.
30.

3E-H
70.
100.
70.
100.
15.
20.
20.R
100.
30.
30.R

14A-D
70.
70.R
100.
15. C
150.
150.
100.
70.R

Cu ppm

8G-H
70.
20.R
20.
15.
15.
15.R

13
50.
50.
30.
30.R
30.
50.
30.
30.R B
50.
20.

7G
15.
200.

10C
3.
3.R
5.
10.R

9B
5.
2.

3E-H
50.
30.
30.
30.
3.
10.
7.P
15.
20.
20.R

31
30.
20.
15.
15.

14A-D
20.
30.R
100. C
50.
100.
150.
70.
70.R

Ga ppm

8G·H
30.0000
30.0000R
7.0000
10.0000
5.0000
5.0000R

13
50.0000
50.0000
50.0000
50.0000R
50.0000
30.0000
50.0000
50.0000R B
50.0000
50.0000

7G
15.0000
15.0000

10C
20.0000
30.0000R
15.0000
20.0000R

9B
20.0000
30.0000

3E-H
15.0000
20.0000
15.0000
15.0000
7.0000
7.0000
10.0000R
20.0000
5.0000
5.0000R

31
30.0000
30.0000
10.0000
15.0000

14A-D
20.0000
20.0000R
30.0000 C
5.0000
30.0000
50.0000
30.0000
15.0000R

p. 2B-26

Ge ppm

8GH
1.2570
1.5190R
1.5460
1.2220
1.1440
1.1730R

13
1.4230
1.0570
1.2320
1.3410R
1.2090
0.9929
0.9840
1.2720R p
1.1090
2.0070

7G
0.3840
1.2040

10C
1.0300
1.0820R
0.6136
0.7445R

9B
0.6475
0.9569

3E-H
0.4191
1.7590
1.3430
1.7420
→ 10.4600
1.3960
1.1390R
0.9894
0.7199
0.4836R

31
1.2840
0.8391
0.8591
0.6009

14A-D
0.9768
1.1150R
1.1650 c
0.7430
1.3320
1.1460
1.4740
1.2120R

Hg ppm

8 G·H
0.0900
0.0800 R
0.0900_
0.1200
0.2000
0.2100 R

13
0.0300
0.0500
0.0600
0.0600 R
0.0500_
0.0700
0.0600
0.0500_R B
0.0500
→ 0.2300

7G
0.1700
0.1400

10 C
0.0100
0.0100 R
0.0300
0.0200 R

9B
0.0200
0.0100

3E-H
0.0200
0.0200_
0.0400
0.0300_
0.0200
0.0200
0.0200_R
0.0500
0.1300
0.1200 R

31
0.0400
0.1100
0.0200
0.0500

14A-D
0.0100
0.0200 R
0.0100_C
0.0200
0.0100
0.0400
0.0100L
0.0100LR

p. 2B-28

I ppm

8G-H
0.5000L
0.5000LR
0.5000L
0.5000L
0.500CL
0.5000LR

13
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L B
0.5000L

7G
0.8437
0.5000L

10C
0.5615
0.5000LR
0.0000B
0.0000BR

9B
0.5000L
0.5000L

3E-H
0.5000L
0.5000L
0.5000L
0.5000L
0.5516
0.5000L
0.5000LR
0.5000L
1.0970
0.9290 R

31
0.5000L
0.7057
0.9721
0.7871

14A-D
0.5000L
0.5000LR
0.5000L
0.7107 C
0.8071
0.5000L
0.5000L
0.5000LR

p. 2B-29

La ppm

8 G-H
70.
70. R
0.N
0.N
0.N
0.NR

13
100.
100.
70.
100.
100.
70.
70.
70. K—3
70.
70.

7G
0.N
0.N

10C
0.N
0.NR
0.N
0.NR

9B
50.
100.

3E-H
50.
50.
0.N
0.N
0.N
0.N
0.NR
0.N
0.N
0.NR

31
70.
70.
0.N
0.N

14A-D
50.
50. R
50.—C
70.
150.
100.
70.
100. R

p. 2B-30

Li ppm

8GH
45.
35.F
9.
5.
5.L
5.LK

13
20.
15.
40.
40.R
50.
60.
60.
55.R
B
45.
45.

7IJ
20.
5.

10C
20.
20.R
20.
18.R

9B
5.
5.

3E-H
20.
40.
50.
50.
5.L
20.
20.R
15.
15.
15.R

31
49.
31.
155.
190.

14A-D
20.
20.R
45.
C
20.
26.
20.
17.
20.R

Mn ppm

8G·H
20.
20.R
10.
10.
20.
10.R

13
20.
50.
150.
150.R
300.
50.
50.
30.R B
50.
20.

7G
500.
50.

10C
100.
100.R
100.
150.R

9B
30.
20.

3E-H
200.
150.
100.
100.
2000.
700.
1000.R
100.
200.
200.R

31
70.
70.
150.
150.

14A-D
150.
200.R
300.
20. C
150.
300.
200.
150.R

Mo ppm

8G-H
10.0000
10.0000 R
10.0000
0.0000N
10.0000
10.0000 R

13
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000NR -B
0.0000N
0.0000N

7G
0.0000N
0.0000N

10C
0.0000N
0.0000NR
0.0000N
0.0000NR

9B
0.0000N
0.0000N

3E-H
10.0000
30.0000
5.0000
7.0000
10.0000
0.0000N
5.0000 R
0.0000N
0.0000N
0.0000NR

31
0.0000N
0.0000N
0.0000N
0.0000N

14A-D
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

Nb ppm

8GH
50.0000
30.0000 R
20.0000
10.0000
0.0000N
10.0000 R

13
20.0000
20.0000
20.0000
20.0000 R
20.0000
20.0000
20.0000
20.0000 R B
20.0000
20.0000

7G
10.0000
20.0000

10C
20.0000
10.0000 R
10.0000
20.0000 R

9B
20.0000
20.0000

3E-H
20.0000
20.0000
20.0000
20.0000
0.0000N
0.0000N
0.0000NR
30.0000
0.0000N
0.0000NR

31
30.0000
30.0000
0.0000N
0.0000N

14A-D
20.0000
20.0000 R
20.0000 C
10.0000
50.0000
20.0000
50.0000
30.0000 R

P. 2B-34

Nd ppm

8G-H
70.
70. R
0.B
0.B
0.B
0.BR

13
70.
70.
70.
150. R
70.
70.
70.
70.LR B
70.L
70.L

7G
0.B
0.B

10C
0.B
0.BR
0.B
0.BR

9B
0.N
0.N

3E-H
0.N
0.N
0.B
0.B
0.B
0.B
0.BR
0.B
0.B
0.BR

31
0.N
0.N
0.B
0.B

14A-D
70.
70.LR
0.N C
200.
0.N
100.
0.N
0.NR

p. 2B-35

Ni ppm

8GH
20.
15.R
10.
10.
10.
10.R

13
30.
50.
50.
50.R
70.
70.
50.
30.R B
50.
20.

7G
15.
30.

10C
20.
15.R
15.
15.R

9B
20.
50.

31
20.
20.
15.
15.

3E-H
70.
100.
30.
20.
10.
7.
10.R
20.
7.
5.R

14A-D
20.
20.R
70. c
10.
30.
50.
20.
30.R

p. 2B-36

Pb ppm

8G-H
30.0000
30.0000 R
50.0000
15.0000
0.0000N
0.0000NR

13
30.0000
20.0000
20.0000
20.0000 R
15.0000
20.0000
15.0000
15.0000R B
20.0000
20.0000

7G
0.0000N
0.0000N

10C
0.0000N
0.0000NR
0.0000N
0.0000NR

9B
10.0000
10.0000

3E-H
10.0000
20.0000
10.0000
10.0000
0.0000N
0.0000N
0.0000NR
10.0000
0.0000N
0.0000NR

31
30.0000
70.0000
10.0000
20.0000

14A-D
10.0000
15.0000 R
10.0000 C
0.0000N
70.0000
30.0000
70.0000
50.0000 R

Pr ppm

0.N
0.N
0.B
0.B
0.B
0.B

0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N

0.B
0.B

0.B
0.B
0.B
0.B

0.N
0.N

0.N
0.N
0.B
0.B

14A-D
0.N
0.NR
0.N c
→ 100.L
0.N
0.N
0.N
0.NR

0.B
0.N
0.B
0.B
0.B
0.B
0.B
0.B
0.B
0.B

p. 2B-38

Rb ppm

8G-H
230.
260.R
40.
65.
35.
35.R

13
235.
230.
195.
195.R
230.
175.
215.
190.R
195. B
180.

7G
75.
65.

10C
125.
115.
100.
85.

9B
155.
150.

3E-H
100.
115.
140.
145.
5.L
6.
5.
150.
5.L
8.

31
190.
120.
105.
145.

14A-D
120.
125.R
250. C
25.
185.
210.
140.
145.R

Sb ppm

8G-H
1.3020
1.8780R
5.3940
1.6750
1.3060
1.5160R

13
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L

7G
1.0000L
1.0000L

10C
1.0000L
1.0000L
1.0000L
1.0000L

9B
1.0000L
1.0000L

3E-H
1.6140
4.8610L
7.0670
14.2700L
6.0000
5.0000L
1.6020R
2.7150
1.5170
1.0000LR

31
1.0000L
-> 1.0000L
1.0860
1.0000L

14A-D
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L

Sc ppm

8G-H
20.0000
15.0000 R
5.0000L
5.0000
5.0000L
5.0000LR

13
30.0000
20.0000
15.0000
20.0000 R
20.0000
20.0000
20.0000
15.0000 R
20.0000 B
15.0000

7G
7.0000
7.0000

10C
15.0000
10.0000 R
10.0000
10.0000 R

9B
10.0000
15.0000

3E-H
10.0000
15.0000
10.0000
10.0000
0.0000N
0.0000N
0.0000NR
15.0000
5.0000
5.0000 R

31
20.0000
20.0000
5.0000
5.0000

14A-D
15.0000
15.0000 R
15.0000
0.0000B C
15.0000
20.0000
15.0000
15.0000 R

Se ppm

8G-H
0.3658
0.8342R
2.7390
1.9340
0.6937
0.1000LR

13
0.1546
0.3915
0.3079
0.1960R
0.2447
0.1556
0.1415
0.2049R B
0.1784
0.3367

7G
0.1000L
0.3648

10C
0.3035
0.3192R
0.2347
0.1933R

9B
0.1000L
0.2871

3E-H
0.3417
0.3489
0.7745
0.3347
0.5763
0.2275
0.1672R
0.3771
0.2739
0.2825R

31
0.3160
0.2889
0.3031
0.1684

14A-D
0.1000L
0.2804R
0.2386 C
0.3166
0.1623
0.1905
0.2132
0.3732R

P 2B-42

Sn ppm

8G-H
1.3280
1.7260R
0.8316
0.3079
0.1535
0.3729R

13
1.5630
1.1800
1.0410
1.1530R
1.1310
0.9677
1.4190
1.2260R B
1.1800
1.0820

7G
0.7781
0.4526

10C
0.7803
0.6988R
0.7100
0.8733R

9B
0.6173
0.6776

3E-H
0.6844
1.3480
0.5765
0.6886
1.5190
2.1710
1.8830R
1.0780
1.3170
0.6223R

31
1.1110
0.6708
2.1830
0.8967

14A-D
0.8788
1.0250R
0.9380 c
0.3069
0.7562
0.6578
0.7196
0.9431R

Sr ppm

8GH
50.
30.P
5.
20.
20.
20.R

13
2000.
200.
300.
300.A
300.
500.
300.
300.A
300.
2000.

7G
300.
15.

10C
70.
70.R
100.
200.R

9B
100.
100.

3E-H
70.
30.
70.
70.
150.
150.
150.R
20.
70.
70.R

31
30.
100.
300.
200.

14A-D
150.
150.R
150.
100. C
1000.
700.
1000.
500.R

P.2B-44

Th ppm

8G-H
22.9200
23.6300R
1.0000L
5.9700
4.4300
1.0000LR

13
23.0500
23.0000
24.1300
18.6400R
24.6200
23.4300
17.2000
16.6800R E
19.9700
23.2200

7G
4.2500
8.8200

10C
12.5700
11.7500R
12.3100
12.0000R

9B
15.9800
18.8000

3E-H
10.3800
24.4300
16.0800
18.0800
3.0200
3.3000
3.4900R
22.4200
12.1500
12.0200

31
12.5600
4.0100
6.1600
6.8000

14A-D
17.6200
21.4700R
29.6400 C
12.3700
30.8800
38.9000
14.6800
27.8900R

p.2B-45

U ppm

8GH
6.6200
6.4200R
4.3100
2.9700
5.6000
5.5300F

13
3.2300
2.7500
3.8100
3.7400R
3.5900
2.3200
2.1700
2.2000F-H
2.4200
2.9000

7G
1.6600
4.2000

10C
1.8100
1.8700
2.0500
2.1000

9B
2.2100
3.4300

3E-H
3.7500
25.8800
9.6200
15.3700
1.4900
0.7400
0.7300R
2.9300
3.0800
3.0500R

31
3.5000
10.2700
1.5600
1.8300

14A·D
9.0700
8.3900R
8.8900 C
2.9600
5.1900
13.7200
8.5500
9.2600R

V ppm

8G-H
700.
500.R
500.
100.
500.
500.R

13
150.
150.
150.
150.
100.
150.
150.
150.R F
150.
100.

7G
70.
100.

10C
70.
70.R
50.
70.R

9B
70.
100.

3E-H
300.
300.
1500.
1500.
10.
10.
10.R
100.
30.
50.R

31
150.
150.
15.
20.

14A-D
70.
70.R
100.
20. c
300.
100.
100.
50.R

p. 2B-47

Y ppm

8G-H
30.
30.R
20.
20.
30.
20.R

13
30.
50.
100.
70.R
50.
30.
30.
30.R-b
30.
20.

7G
10.
30.

10C
20.
30.R
20.
50.R

9B
30.
50.

3E-H
50.
20.
30.
50.
10.
10.
10.R
20.
20.
20.R

31
70.
150.
20.
10.

14A-D
50.
70.R
30.
70.c
100.
70.
100.
70.R

p. 2B-48

Yb ppm

8 GH
0.0000B
0.0000BR
3.0000
3.0000
0.0000B
0.0000BR

13
5.0000
5.0000
7.0000
7.0000R
5.0000
3.0000
3.0000
3.0000R B
3.0000
3.0000

7G
1.0000
3.0000

10C
3.0000
3.0000R
3.0000
5.0000R

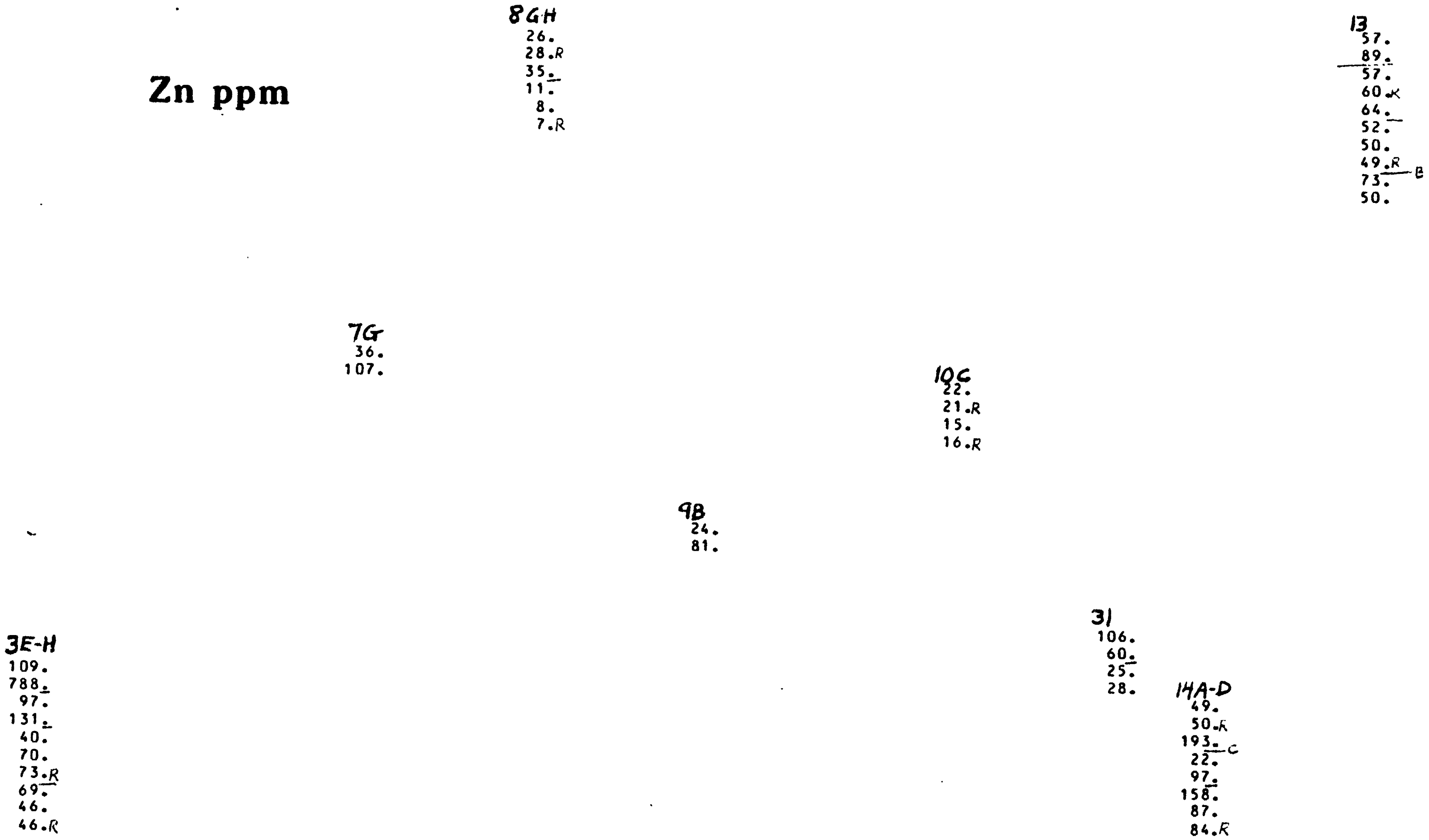
9B
3.0000
7.0000

3E H
5.0000
3.0000
0.0000B
0.0000B
0.0000B
1.0000
1.0000R
3.0000
2.0000
2.0000R

31
7.0000
15.0000
1.0000
0.0000B

14A-D
7.0000
10.0000R
5.0000 C
10.0000
15.0000
7.0000
15.0000
7.0000R

Zn ppm


8GH
26.
28.R
35.
11.
8.
7.R
13
57.
89.
57.
60.K
64.
52.
50.
49.R
73.
50.
B
7G
36.
107.
10C
22.
21.R
15.
16.R
9B
24.
81.
3E-H
109.
788.
97.
131.
40.
70.
73.R
69.
46.
46.R
31
106.
60.
25.
28.
14A-D
49.
50.R
193.
C
22.
97.
158.
87.
84.R

Zr ppm

8G-H
150.
150.R
10.
100.
30.
30.R

13
150.
100.
150.
150.R
100.
150.
200.
150.R B
100.
100.

7G
30.
150.

10C
100.
150.R
100.
30.R

9B
500.
700.

3E-H
200.
200.
200.
100.
70.
30.
30.R
700.
100.
150.R

31
500.
700.
30.
50.

14A-D
1000.
1500.R
200. C
150.
700.
200.
700.
700.R

Biotite %

```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
0.0000N
0.0000N
```

```
0.0000N
0.0000N
0.0000N
0.0000N
```

```
0.0000N
```

3E-H

```
20.0000
25.0000
12.0000
15.0000
 0.0000N
 0.0000N
 0.0000NR
 0.0000N
 0.0000N
 0.0000NR
```

```
0.0000N
0.0000N
0.0000N
0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
```

p. 2B-52

Muscovite-Illite %

8G-H

65.0000
70.0000
15.0000
10.0000
10.0000
10.0000

13

85.0000
85.0000
70.0000
65.0000 R
80.0000
57.0000
65.0000
67.0000 R B
75.0000
80.0000

7G

25.0000
25.0000

10C

50.0000
45.0000
30.0000
30.0000

9B

52.0000
60.0000

3E-H

10.0000
15.0000
0.0000N
10.0000
0.0000N
0.0000N
0.0000NR
50.0000
0.0000N
0.0000NR

31

66.0000
50.0000
20.0000
40.0000

14A-D

31.0000
25.0000 R
80.0000 C
25.0000
50.0000
75.0000
35.0000
32.0000 R

Muscovite-Illite Modifier

1-Muscovite

2-Intermediate

3-Illite

8GH
1.0000
1.0000
1.0000
1.0000
1.0000
1.0000

13
3.0000
3.0000
3.0000
3.0000 R
3.0000
3.0000
3.0000
3.0000 R 13
3.0000
3.0000

7G
1.0000
2.0000

10C
2.0000
3.0000 R
3.0000
2.0000 R

9B
2.0000
2.0000

3E-H
1.0000
1.0000
0.0000B
1.0000
0.0000B
0.0000B
0.0000BR
1.0000
0.0000B
0.0000BR

31
2.0000
2.0000
2.0000
3.0000

14A-D
3.0000
3.0000 R
3.0000 C
3.0000
2.0000
3.0000
2.0000
2.0000 R

Mixed-layer clay %

8G-H
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000NR

13
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000NR B
0.0000N
0.0000N

7G
0.0000N
0.0000N

10C
0.0000N
0.0000NR
0.0000N
0.0000NR

9B
0.0000N
0.0000N

31
0.0000N
0.0000N
→ 5.0000
0.0000N

3E-H
5.0000
→ 5.0000
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000NR

14A-D
0.0000N
0.0000NR
0.0000N C
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

Mixed-layer Modifier

1-ISII ordered
2-IS ordered
3-I≷S random
4-S>I
5-S≫I
6-Cl-S

I-Illite
S-Smectite
Cl-Chlorite

0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B

0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B

0.0000B
0.0000B

0.0000B
0.0000B
0.0000B
0.0000B

0.0000B
0.0000B

3 E-H

2.0000
3.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B

31

0.0000B
0.0000B
3.0000
0.0000B

0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B

Kaolinite %

8G-H
0.0000N
0.0000NR
0.0000N
10.0000
0.0000N
0.0000NR

13
0.0000N
0.0000N
10.0000
10.0000R
2.0000
20.0000
15.0000
15.0000 k — B
10.0000
0.0000N

7G
0.0000N
5.0000

10C
0.0000N
0.0000NR
0.0000N
0.0000NR

9B
0.0000N
0.0000N

3E-H
0.0000N
5.0000
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000NR

31
0.0000N
0.0000N
0.0000N
0.0000N

14A-D
0.0000N
0.0000NR
0.0000N — C
0.0000N
16.0000
0.0000N
15.0000
5.0000 R

Kaolinite

Modifier

1-Well crystallized

2-Intermediate

3-Poorly crystallized

8G-H
0.0000B
0.0000BR
0.0000B
1.0000
0.0000B
0.0000BR

13
0.0000B
0.0000B
3.0000
3.0000R
0.0000B
3.0000
3.0000
3.0000R
3.0000
0.0000B

7G
0.0000B
1.0000

10C
0.0000B
0.0000BR
0.0000B
0.0000BR

0.0000B
0.0000B

3E-H
0.0000B
3.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B

31
0.0000B
0.0000B
0.0000B
0.0000B

14A-D
0.0000B
0.0000BR
0.0000B
0.0000B C
1.0000
0.0000B
1.0000
0.0000BR

p. 2B-58

Chlorite %

8GH
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000NR

13
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR B
0.0000N
0.0000N

7G
0.0000N
0.0000N

10C
0.0000N
0.0000NR
0.0000N
0.0000NR

9B
0.0000N
0.0000N

3E-H
5.0000
0.0000N
0.0000N
0.0000N
0.0000N
15.0000
15.0000 R
5.0000
10.0000
10.0000 R

31
0.0000N
0.0000N
5.0000
10.0000

14A-D
0.0000N
0.0000NR
0.0000N C
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

Corrensite %

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N

3E-H
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
10.0000
10.0000 R

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

Talc %

```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
0.0000N
0.0000N
```

```
0.0000N
0.0000N
0.0000N
0.0000N
```

```
0.0000N
0.0000N
```

3E-H

```
20.0000
 0.0000N
 0.0000N
 1.0000
 0.0000N
 0.0000N
 0.0000NR
 0.0000N
20.0000
20.0000 R
```

```
0.0000N
0.0000N
0.0000N
0.0000N
          0.0000N
          0.0000N
          0.0000N
          0.0000N
          0.0000N
          0.0000N
          0.0000N
          0.0000N
```

P, 2B-61

Total clay %

8G-H
65.0000
70.0000R
15.0000
20.0000
10.0000
10.0000R

13
85.0000
85.0000
80.0000
75.0000R
82.0000
77.0000
80.0000
82.0000R
85.0000 B
80.0000

7G
25.0000
30.0000

10C
50.0000
45.0000R
30.0000
30.0000R

9B
52.0000
60.0000

3E-H
60.000C
50.0000
12.0000
26.0000
5. L F
15.0000
15.0000R
55.0000
40.0000
40.0000R

31
66.0000
50.0000
30.0000
50.0000

14A-D
31.0000
25.0000R
80.0000
25.0000 C
66.0000
75.0000
50.0000
37.0000R

Quartz %

8G-H
27.0000
23.0000R
83.0000
77.0000
89.0000
90.0000R

13
8.0000
10.0000
12.0000
12.0000R
10.0000
12.0000
10.0000
8.0000R B
7.0000
11.0000

7G
11.0000
70.0000

10C
18.0000
21.0000R
33.0000
30.0000R

9B
33.0000
25.0000

3E-H
15.0000
33.0000
70.0000
46.0000
8.0000
15.0000
18.0000R
43.0000
5.0000
6.0000R

31
22.0000
35.0000
12.0000
2.0000

14A-D
50.0000
55.0000R
6.0000 C
75.0000
22.0000
11.0000
38.0000
48.0000R

K-feldspar %

8G-H
8.0000
8.0000R
2.0000
3.0000
1.0000
0.0000NR

13
7.0000
4.0000
8.0000
10.0000R
8.0000
11.0000
10.0000
10.0000R B
8.0000
5.0000

7G
0.0000N
0.0000N

10C
11.0000
12.0000R
15.0000
15.0000R

9B
13.0000
15.0000

3E-H
5.0000
14.0000
18.0000
20.0000
0.0000N
0.0000N
0.0000NR
2.0000
0.0000N
0.0000NR

31
12.0000
15.0000
16.0000
10.0000

14A-D
19.0000
20.0000R
10.0000
0.0000N C
12.0000
10.0000
12.0000
12.0000R

p. 28-64

K-feldspar Modifier

1-Monoclinic

2-Both

3-Triclinic

8G-H
0.0000B
1.0000 R
0.0000B
0.0000B
0.0000B
0.0000BR

13
1.0000
1.0000
1.0000
1.0000 R
1.0000
1.0000
1.0000
1.0000R B
1.0000
0.0000B

7G
0.0000B
0.0000B

10C
1.0000
1.0000 R
1.0000
1.0000 R

9B
1.0000
3.0000

3E-H
0.0000B
1.0000
1.0000
1.0000
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000BR

31
1.0000
1.0000
1.0000
2.0000

14A-D
1.0000
1.0000 R
1.0000 C
0.0000B
3.0000
1.0000
3.0000
3.0000 R

p. 2B-65 (66, Plag., all N)

Calcite %

8GH
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000NR

13
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N B
0.0000N
0.0000N

7G
55.0000
0.0000N

10C
0.0000N
0.0000NR
0.0000N
0.0000NR

9E
0.0000N
0.0000N

3E·H
20.0000
0.0000N
0.0000N
0.0000N
17.0000
20.0000
20.0000 R
0.0000N
50.0000
52.0000 R

31
0.0000N
0.0000N
0.0000N
0.0000N

14A-D
0.0000N
0.0000NR
0.0000N C
0.2000
0.0000N
2.0000
0.0000N
0.0000NR

Dolomite %

8G-H
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000NR

13
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000NR B
0.0000N
0.0000N

7G
8.0000
0.0000N

10C
20.0000
22.0000R
22.0000
25.0000 R

9B
0.0000N
0.0000N

3E-H
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
2.0000
2.0000 R

31
0.0000N
0.0000N
45.0000
36.0000

14A-D
0.0000N
0.0000NR
0.0000N c
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

p. 2B-68

Hematite %

8G-H
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000NR

13
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N G
0.0000N

7G
0.0000N
0.0000N

10C
1.0000
0.5000 R
0.0000N
0.0000NR

9B
1.0000
1.5000

3E-H
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000NR

31
0.0000N
1.0000
0.0000N
0.0000N

14A-D
0.5000
0.0000NR
0.5000 C
0.5000
0.5000
1.0000
0.5000
0.7000R

p. 2B-69 (70, Goethite, all N)

Anatase %

8G-H
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

13
0.5000
0.3000
0.5000
0.5000R
0.3000
0.0000N
0.5000
0.3000R 13
0.3000
0.5000

7G
0.0000N
0.0000N

10C
0.3000
0.2000 R
0.0000N
0.0000NR

9B
0.0000N
0.0000N

3E-H
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

31
0.5000
0.5000
0.0000N
0.0000N

14A-D
0.0000N
0.0000NR
0.5000 C
0.0000N
1.0000
0.7000
1.0000
1.0000 R

Hornblende %

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N

3E-H
0.0000N
2.0000
0.0000N
0.0000N
70.0000
3.0000
2.0000 R
0.0000N
0.0000N
0.0000NR

0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

p 2B-72(73, Apatite, all N)

Pyrite %

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N

14A-D
0.0000N
0.0000NR
0.0000N
0.0000N c
0.0000N
→ 0.2000
0.0000N
0.0000NR

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

Carbonate sample numbers

8

08HCL
08HCU
08GCL
08GCU
08FCL
08FCU
08ECL
08ECLR
08ECU

08DCL
08DCU
08CCL
08CCU
08BCL
08BCU
08ACL
08ACU
08ACUR

11

11HCL
11HCU
11GCL
11GCU
11FCL
11FCU
11ECL
11ECU
11DCL
11DCU
11CCL
11CCU
11BCL
11BCU
11ACL
11ACU

12

12DCL
12DCU
12CCL
12CCU
12BCL
12BCU
12ACL
12ACU

1

01HCL
01HCU
01GCL
01GCU
01FCL
01FCU
01ECL
01ECU
01DCL
01DCU
01CCL
01CCU
01BCL
01BCU
01ACL
01ACU

13

13ECL
13ECU
13DCL
13DCU
13CCL
13CCU
13BCL
13BCU
13BCUR
13ACL
13ACU

30

30CCL
30CCU
30ACL
30ACU

7

07HCL
07HCU
07GCL
07GCU
07FCL
07FCU
07ECL
07ECU

07DCL
07DCU
07CCL
07CCU
07CCUR
07BCL
07BCU
07ACL
07ACU

9

09HCL
09HCU
09GCL
09GCU
09FCL
09FCU
09ECL
09ECU
09DCL
09DCU
09CCL
09CCU
09BCL
09BCU
09ACL
09ACU

20

20CCL
20CCLR
20CCU
20ACL
20ACU

10

10HCL
10HCU
10GCL
10GCU
10FCL
10FCU
10ECL
10ECLR
10ECU

10DCL
10DCLR
10DCU
10CCL
10CCU
10CCUR
10BCL
10BCU
10BCUR
10ACL
10ACLR
10ACU

26

26CCL
26CCU
26ACL
26ACU

29

29CCL
29CCU
29CCUR
29ACL
29ACU

28

28CCL
28CCU
28ACL
28ACU

6

06HCL
06HCU
06GCL
06GCU
06FCL
06FCU
06ECL
06ECU

06DCL
06DCU
06CCL
06CCU
06BCL
06BCU
06ACL
06ACU

5

05HCL
05HCU
05GCL
05GCLR
05GCU
05FCL
05FCU
05ECL
05ECU

05DCL
05DCU
05CCL
05CCLR
05CCU
05BCL
05BCU
05ACL
05ACU

32

32CCL
32CCU
32ACL
32ACU

31

31CCL
31CCU
31ACL
31ACU
31ACUR

3

03HCL
03HCU
03GCL
03GCU
03FCL
03FCLR
03FCU
03ECL
03ECU
03DCL
03DCU
03DCUR
03CCL
03CCU
03BCL
03BCU
03ACL
03ACU

24

24CCL
24CCU
24CCUR
24ACL
24ACU

25

25CCL
25CCU
25ACL
25ACU
25ACUR

2

02HCL
02HCU
02GCL
02GCU
02FCL
02FCU
02ECL
02ECU

02DCL
02DCU
02CCL
02CCU
02BCL
02BCU
02ACL
02ACU
02ACUR

14

14HCL
14HCU
14GCL
14GCU
14FCL
14FCU
14ECL
14ECU

14DCL
14DCU
14CCL
14CCU
14BCL
14BCLR
14BCU
14BCUR
14ACL
14ACU

4

04HCL
04HCU
04GCL
04GCU
04FCL
04FCU
04FCUR
04ECL
04ECU
04ECUR

04DCL
04DCU
04CCL
04CCU
04CCUR
04BCL.
04BCLR
04BCU
04ACL
04ACU

23

23CCL
23CCU
23ACL
23ACU

21

21CCL
21CCU
21ACL
21ACU

22

22CCL
22CCLR
22CCU
22ACL
22ACU

SiO2 %

8

1.5240	0.2000
13.5000	0.3000
22.1100	0.1000
34.0100	0.3000
52.2700	0.3000
50.5100	0.1000
22.6700	0.2000
22.8500R	0.3000
33.6100	0.3000R

11

0.2000
0.2000
0.3000
0.6869
0.5000
0.2000
0.5000
1.2680
0.3000
1.3660
0.5000
0.7222
0.6945
0.5000
0.5000
0.3000

12

0.3000
0.3000
0.3000
0.3000
0.5000
3.3570
0.5000
3.0190

1

0.8025
0.8570
1.5440
0.2000
1.4470
0.2000
0.5000
0.5524
2.0460
0.5000
1.6070
9.9530
0.6733
0.5000
1.9080
0.5000

13

0.5000
0.5000
11.0300
5.1190
28.6600
14.1800
4.8690
2.4320
1.9750R
3.8290
5.3940

30

0.6483
0.3000
0.3000
4.7930

7

2.5390	1.7790
13.2200	10.6600
9.2610	32.7300
1.6090	7.9350
14.0500	8.4670R
12.5100	10.6700
21.7000	43.5700
10.8200	40.4200
	40.2000

9

1.2150
0.8129
0.3000
0.3000
5.5890
0.3000
0.5599
0.5030
0.3000
0.2000
0.5000
0.3000
0.0500
1.0470
0.1000
0.8595

20

0.2000
0.3000R
0.3000
0.2000
0.0700

10

	0.3000
2.6890	0.3000R
0.9800	0.1000
0.5000	3.5360
0.5419	0.2000
0.5000	0.3000R
0.3000	0.2000
0.3000	0.1500
0.1500R	0.3000R
0.5000	0.3000
	0.3000R
	0.2000

26

4.9580
0.3000
2.2870
0.1500

29

2.2740
0.2000
0.5000R
0.5000
0.3000

28

0.6939
0.2000
2.2760
0.3000

6

0.0700	7.5730
0.0500	1.0770
0.0500	3.9600
0.1500	0.0700
0.5000	0.0700
3.6930	0.1500
4.3270	0.5295
0.1000	0.1000

5

0.1500	0.6255
0.3000	0.7813
0.2000	0.7656
0.3000R	0.7226R
2.9600	0.2000
0.3000	0.3000
0.1000	4.0110
0.1000	0.3000
0.2000	10.8300

32

0.5000
0.5000
0.5000
0.1500

31

0.1000
0.5000
6.2460
11.0000
9.6340R

3

0.5000
1.5340
24.0700
3.9480
4.6200
3.7010R
0.6016
0.6648
7.8120
0.1500
2.5110
2.2640R
8.4840
17.9500
0.3000
0.5000
0.1500
0.1000

24

0.2000
0.1500
0.2000R
1.3740
0.1500

25

2.7520
0.3000
0.0700
0.2000
0.0700R

2

0.5257	13.3900
1.1960	1.7210
0.1000	16.3000
0.2000	6.5830
6.8990	4.9320
0.1000	14.5700
0.5000	6.1400
3.0250	2.8170
	2.8280R

14

	0.5000
7.8110	0.3000
8.4590	0.3000
1.1450	0.3000
0.7635	0.1500
0.5000	0.1500R
0.6676	0.5000
0.6134	0.3000R
0.3000	0.5000
	0.0700

4

0.5000	0.1500
0.0300	0.1000
16.9700	0.1000
0.5000	2.7500
0.6264	2.6430R
0.2000	0.0700
0.3000R	0.0700R
1.7060	0.0700
0.5000	0.9978
0.3000R	0.0700

23

0.1500
0.0200
0.3000
0.0500

21

2.1990
0.5483
0.5000
0.1500

22

1.2300
1.5360R
0.5122
0.9601
9.1740

Al2O3 %

8

0.1000	0.1000
1.5000	0.0500
1.5000	0.0500
4.9620	0.1500
2.3350	0.1000
4.2120	0.0500
0.8013	0.1500
0.8954R	0.2000
2.5970	0.2000R

11

0.1500
0.1500
0.1000
0.1500
0.1500
0.0700
0.1500
0.5000
0.1500
0.1000
0.1000
0.2000
0.1500
0.2000
0.0700
0.1500

12

0.2000
0.2000
0.2000
0.1500
0.1500
0.1500
0.1500
0.7000

1

0.1500
0.3000
0.1000
0.1000
0.1500
0.0700
0.1500
0.1000
0.5000
0.1500
0.5000
0.0500
0.1500
0.0700
0.2000
0.0700

13

0.2000
0.1500
0.1500
0.5000
1.1920
0.6966
0.5000
0.3000
0.3000R
0.5000
0.5000

30

0.1500
0.1500
0.1000
0.5000

26

0.7497
0.1000
0.3000
0.0500

7

0.2000	0.3000
1.0000	1.5000
0.2000	0.5000
0.1500	1.3000
0.1500	0.8762R
0.2000	0.3000
0.2000	4.6600
1.8000	4.4530
	5.5000

9

0.3000
0.1500
0.1500
0.1500
0.1500
0.1500
0.1500
0.1500
0.0300
0.1000
0.1000
0.0200
0.0200
0.3000
0.0300
0.1500

20

0.1000
0.1500R
0.1000
0.0700
0.0200

10

0.0700	0.1000
0.3000	0.1500R
0.1000	0.0500
0.1500	0.3000
0.1000	0.1000
0.2000	0.1500R
0.1000	0.0300
0.0500R	0.0500
0.1500	0.1000R
	0.1500
	0.1000R
	0.1500

29

0.5000
0.1500
0.1500R
0.0700
0.0200

28

0.0500
0.0500
0.2000
0.2000

6

0.0150	0.3000
0.0200	0.1500
0.0100	0.0300
0.0200	0.0300
0.1000	0.0300
0.0300	0.0500
0.3000	0.1500
0.0300	0.0200

24

0.1000
0.0300
0.0700R
0.1500
0.0500

3

0.1500
0.0700
5.4430
0.2000
0.5000
0.5000R
0.0500
0.1500
0.5000
0.1500
0.2000
0.2000R
0.0700
0.5808
0.1000
0.1500
0.0700
0.0700

23

0.0300
0.0300
0.1000
0.0150

4

0.1500	0.0500
0.0100	0.0300
0.0200	0.0300
0.0200	0.0200
0.1000	0.0300R
0.1000	0.0200
0.2000R	0.0300R
0.5000	0.0200
0.1000	0.0300
0.1500R	0.0200

25

0.2000
0.1500
0.0300
0.0200
0.0200R

5

0.1500	0.1500
0.0500	0.0200
0.0700	0.0200
0.0500R	0.0300R
0.3000	0.0500
0.1500	0.1000
0.0200	0.0300
0.0500	0.1500
0.0500	0.0200

32

0.3000
0.1500
0.1500
0.1000

31

0.0500
0.2000
1.0000
0.5000
0.2000R

2

0.1500	0.5000
0.2000	0.5000
0.0700	0.7000
0.1000	1.0030
0.5000	0.5000
0.0300	0.9288
0.1500	0.2000
0.1500	0.3000
	0.2000R

14

0.5000	0.2000
0.5000	0.1500
0.5000	0.2000
0.5000	0.0700
0.3000	0.0500
0.2000	0.0500R
0.1500	0.2000
0.2000	0.1500R
	0.1500
	0.0200

21

0.3000
0.3000
0.1000
0.0300

22

0.0700
0.0700R
0.0700
0.1500
0.5000

Fe2O3 %

8
0.8099 0.4277
1.2520 0.4895
0.9190 0.1593
3.2850 0.4422
1.1540 0.1386
1.5240 0.3626
0.7306 0.4718
0.7248R 0.2643
0.9947 0.2692R

11
0.2603
0.3504
0.3717
0.2497
0.2523
0.2585
0.4207
0.4640
0.3080
0.2610
0.1965
0.4295
0.1518
0.1549
0.2565
0.2831

12
0.2112
0.2864
0.2547
0.2804
0.3527
0.5261
0.3318
0.6560

1
0.3288
0.2135
0.1705
0.1083
0.2429
0.1062
0.2720
0.3419
0.4339
0.2936
0.4037
0.2087
0.2522
0.3084
0.4501
0.0816

13
0.4151
0.3894
0.1561
1.4640
7.3070
4.0180
1.6960
1.1690
1.2250R
1.4830
1.6850

30
0.2877
0.1554
0.1954
0.2283

7
0.1550 0.1612
0.7742 0.5750
0.4405 0.2516
0.0506 1.1200
0.1526 1.0400R
0.1227 0.1682
0.1371 1.4280
0.8000 1.4900
1.2850

9
0.2608
0.1519
0.0661
0.2461
0.1114
0.0769
0.0617
0.1170
0.0584
0.0708
0.1124
0.0927
0.0828
0.1348
0.0500
0.1296

20
0.1722
0.1857R
0.1728
0.1655
0.0512

10
0.2151
0.2149 0.1557R
0.1500 0.2470
0.1527 0.4191
0.1637 0.2992
0.1560 0.2527R
0.2564 0.1965
0.2033 0.2397
0.2134R 0.2660R
0.4521 0.1708
0.1906R
0.2066

26
0.5822
0.3970
0.7516
0.1374

29
0.2637
0.1766
0.1480R
0.0800
0.0503

28
0.1042
0.0746
0.1645
0.0932

6
0.0100 0.1103
0.0564 0.1225
0.0200 0.1704
0.0760 0.0200
0.1006 0.0200
0.1132 0.0613
0.1807 0.1221
0.0808 0.0200

24
0.0823
0.0513
0.0500R
0.0820
0.0500

5
0.0573 0.2298
0.1173 0.3625
0.1079 0.1232
0.0959R 0.1176R
0.3367 0.1099
0.1122 0.1461
0.1106 0.1127
0.1370 0.2123
0.0632 0.0580

25
0.2285
0.0717
0.0200
0.0100
0.0150R

3
0.1695
0.1589
3.3190
0.1154
0.6568
0.5433R
0.5868
0.2003
0.3306
0.2067
0.3137
0.2151R
0.4624
0.6191
0.0906
0.0500
0.0300
0.0512

23
0.0300
0.1303
0.0679
0.0300

4
0.1163 0.0719
0.0300 0.0630
0.0643 0.0781
0.0200 0.0200
0.1927 0.0200R
0.0300 0.0200
0.0200R 0.0200R
0.3077 0.0837
0.0791 0.1153
0.0596R 0.1413

32
1.0050
0.3557
0.6081
0.6434

31
0.1965
0.2194
0.6780
0.5134
0.4488R

14 0.6682
0.4756 0.4044
0.4794 0.5266
0.3389 0.1044
0.3955 0.2040
0.4996 0.2563R
0.2417 0.1368
0.4167 0.1172R
0.3562 0.2479
0.1322

2
0.3409 0.3718
0.2675 0.4314
0.2757 0.3800
0.3367 0.7939
0.4817 0.3839
0.3332 0.8968
0.4151 0.5988
0.5688 0.3159
0.2660R

21
0.1595
0.1272
0.2746
0.1086

22
0.3037
0.3079R
0.2073
0.1861
1.1760

p. 2C-4

MgO %

8
19.9000 20.4000
2.9800 21.0000
1.0100 16.0000
2.5200 20.7000
6.0000 21.1000
7.8800 20.4000
3.9800 21.0000
4.1300R 20.6000
7.0000 21.1000R

11
20.7000
20.1000
21.1000
20.7000
21.0000
20.7000
20.5000
19.9000
20.4000
20.4000
19.9000
20.2000
20.6000
20.5000
20.3000
20.9000

12
20.6000
20.7000
20.5000
21.0000
21.1000
3.2500
20.2000
15.2000

1
20.4000
20.7000
20.6000
19.5000
20.3000
21.1000
14.5000
20.6000
16.7000
20.9000
20.5000
18.8000
19.4000
20.2000
20.6000
18.7000

30
20.5000
18.9000
20.1000
15.4000

13
19.7000
19.4000
18.4000
17.4000
10.4000
14.5000
17.3000
18.1000
17.9000R
18.5000
18.7000

7
0.4700 5.2500
0.8000 2.3800
0.4600 0.5300
20.2000 0.8500
17.5000 0.8900R
18.0000 0.8100
16.7000 7.4300
1.3300 6.8000
7.4300

9
20.4000
20.4000
21.6000
21.1000
19.8000
21.1000
20.7000
20.5000
22.0000
21.1000
21.3000
21.2000
21.3000
20.8000
20.4000
21.6000

20
20.6000
20.5000R
20.9000
20.7000
21.0000

10
1.0000 19.8000
0.8200 19.5000R
20.9000 20.0000
20.3000 20.1000
20.6000 20.9000
20.7000 21.0000R
20.7000 21.2000
21.5000R 21.1000
20.9000 20.6000R
19.2000
20.4000R
20.2000

26
18.8000
21.0000
17.9000
20.3000

29
20.4000
19.9000
20.6000R
20.7000
20.9000

28
21.0000
20.9000
20.5000
19.2000

6
21.3000 19.0000
21.3000 20.5000
21.2000 20.1000
20.8000 21.3000
20.9000 20.9000
20.6000 21.1000
20.3000 20.4000
20.6000 20.2000

5
19.6000 20.3000
21.0000 20.7000
20.2000 20.9000
20.6000R 20.7000R

25
20.0000 20.3000 20.6000
21.2000 20.1000 20.2000
21.7000 20.8000 19.7000
21.1000 20.7000 19.0000
20.7000R 20.3000 18.8000

32
20.0000
19.9000
20.7000
20.8000

31
20.8000
21.0000
4.0000
15.6000
15.4000R

3
20.6000
20.1000
1.3600
19.9000
20.5000
21.3000R
20.6000
20.2000
3.4700
20.9000
19.5000
20.0000R
14.8000
16.3000

23
20.7000 20.9000
18.4000 21.3000
21.0000 20.5000
21.2000 20.9000

24
20.3000
21.1000
20.9000R
20.6000
20.9000

4
20.9000 21.3000
21.2000 20.1000
17.8000 21.3000
19.6000 20.8000
20.6000 20.7000R
21.1000 20.5000
21.4000R 20.7000R
20.5000 18.5000
20.9000 21.0000
20.9000R 20.7000

2
20.0000 17.3000
20.5000 19.5000
20.5000 6.7500
20.9000 16.9000
18.8000 18.3000
20.8000 16.3000
20.7000 18.9000
20.0000 19.7000
19.8000R

14
20.5000
16.7000 20.9000
18.8000 20.7000
20.5000 20.1000
20.8000 20.2000
20.6000 20.8000R
20.7000 20.2000
20.7000 20.5000R
20.7000 20.8000
21.2000

21
17.9000
21.9000
20.4000
21.0000

22
21.0000
20.5000R
20.1000
20.8000
17.7000

p. 2C -5

CaO %

8
31.6100 33.0100
45.0400 32.7100
43.4200 33.1100
25.1200 34.0200
14.9500 32.3400
13.0100 33.0700
38.0400 33.3000
37.9600R 32.7900
25.5600 33.3100R

11
33.7700
35.0900
32.3400
33.6300
33.2600
34.6100
33.2800
32.8500
32.8000
33.2600
33.9000
32.6400
33.3000
33.2300
33.0400
34.2300

12
33.1300
32.6100
33.1100
33.4700
33.7600
53.6800
33.4600
37.4900

1
33.4700
31.9900
32.4400
35.5800
33.0400
32.9300
39.9200
32.9500
31.4600
33.7200
31.2400
29.1700
33.7000
33.2400
32.1000
34.8800

13
34.6900
34.6300
29.2800
31.2300
23.3400
26.6600
33.2800
33.9700
34.9000R
31.5500
31.5200

30
33.3900
33.9400
34.0100
36.6400

7
55.2900 49.6100
45.0000 45.2400
51.7000 38.7100
32.2900 49.5900
27.8500 51.1600R
29.6400 51.7500
26.8000 15.3200
46.1800 18.5900
18.9100

9
34.0300
32.8700
33.4200
33.7200
29.8600
32.0700
31.6600
31.8300
33.0400
32.9600
31.0300
32.1800
33.3800
32.2800
32.5300
33.2000

20
32.4500
33.1500R
31.9900
31.8100
32.4600

10
35.3500
53.3600 33.8800R
52.9000 33.7800
32.1300 31.7400
33.4700 33.8400
33.4100 32.2200R
32.6300 33.2800
31.5100 32.5500
33.7600R 33.0800R
34.2400 32.6500
34.0600R
34.6100

26
31.1100
31.1100
32.8600
35.4400

29
32.4200
32.6400
32.6100R
29.7000
33.4900

28
32.7500
31.7500
32.2000
34.3900

6
34.4900 29.8700
33.3000 32.3500
32.2600 31.7400
34.1300 33.0500
33.3400 32.1700
32.9000 33.3500
32.5400 33.8600
34.6800 34.0500

5
35.3400 32.1500
31.8100 33.3500
33.9300 33.2400
33.8800R 32.3300R
33.5700 33.9300
34.6800 33.0100
34.0200 31.2100
33.5900 35.7700
33.5100 30.5300

32
32.5200
32.6000
30.2300
31.1900

31
32.2600
34.6800
45.7300
34.7600
32.0600R

3
34.0800
32.7100
34.8300
30.6500
34.1200
30.6900R
33.8400
32.3900
48.7100
33.9700
32.6800
31.1900R
29.5000
25.1600
34.2300
31.8900
32.7800
32.8300

24
34.1000
32.0500
32.2800R
31.8000
32.8400

25
31.0800
32.0200
33.7600
34.2900
33.0700R

2
33.5300 29.6000
33.2700 33.2600
33.8600 35.7000
32.5200 33.2800
29.5400 32.5700
33.1800 27.4700
33.1200 31.6000
31.0700 32.0600
31.0800R

14
32.0500
30.9500 32.0300
29.4900 31.8600
33.4400 34.4700
34.2600 33.8600
32.5600 34.3100R
31.7400 32.8600
32.1900 33.3400R
32.6800 33.5100
34.4800

4
32.9100 32.2000
33.0400 33.0500
28.8600 33.5500
35.2800 31.5000
32.5100 30.7200R
33.0900 32.4000
31.9500R 32.6500R
32.6100 32.6300
33.8100 33.0000
34.2600R 34.9700

21
35.0800
33.6200
33.8800
33.5100

22
31.0500
32.0200R
32.1800
32.9900
30.2500

23
33.0700
32.3900
33.0800
32.5900

p. 2C-6

Na2O %

8
0.0200
0.0100
0.0200
0.0300
0.0200
0.0200
0.0100
0.0200R
0.0300

0.0200
0.0200
0.0300
0.0300
0.0400
0.0500
0.0200
0.0400
0.0300R

11
0.0500
0.0300
0.0300
0.0400
0.0300
0.0300
0.0400
0.0300
0.0300
0.0300
0.0300
0.0300
0.0400
0.0400
0.0200
0.0300

12
0.0300
0.0400
0.0200
0.0200
0.0200
0.0100
0.0400
0.0400

1
0.0300
0.0300
0.0300
0.0600
0.0300
0.0400
0.0200
0.0300
0.0600
0.0500
0.0500
0.0400
0.0600
0.0600
0.0500
0.0700

13
0.0400
0.0600
0.0400
0.0600
0.0300
0.0300
0.0300
0.0300
0.1000R
0.0300
0.0300

30
0.0400
0.0500
0.0300
0.0400

7
0.0200
0.0200
0.0200
0.0200
0.0200
0.0200
0.0200
0.0300

0.0100
0.2800
0.0100
0.0200
0.0300R
0.0100
0.6200
0.6700
0.4300

9
0.0200
0.0200
0.0200
0.0300
0.0300
0.0200
0.0300
0.0300
0.0300
0.0200
0.0200
0.0200
0.0300
0.0200
0.0300
0.0200

20
0.0300
0.0300R
0.0200
0.0300
0.0200

10
0.0200
0.0100
0.0500
0.0400
0.0300
0.0300
0.0400
0.0400R
0.0300

0.0400
0.0400R
0.0300
0.0300
0.0300
0.0300R
0.0300
0.0400
0.0400R
0.0400
0.0300R
0.0300

26
0.0600
0.0300
0.0300
0.0300

29
0.0400
0.0300
0.0300R
0.0200
0.0500

28
0.0300
0.0200
0.0400
0.0200

6
0.0300
0.0200
0.0200
0.0300
0.0700
0.0300
0.0200
0.0300

0.0400
0.0300
0.0300
0.0300
0.0200
0.0200
0.0100
0.0200

24
0.0300
0.0400
0.0400R
0.0500
0.0400

5
0.0200
0.0300
0.0300
0.0200R
0.0200
0.0200
0.0300
0.0300
0.0400

0.0300
0.0200
0.0100
0.0100R
0.0400
0.0400
0.0300
0.0200
0.0100

25
0.0400
0.0300
0.0200
0.0200
0.0500R

32
0.0200
0.0200
0.0300
0.0200

31
0.0400
0.0300
0.0300
0.0200
0.0200

3
0.0300
0.0100
0.0700
0.0200
0.0100
0.0100R
0.0200
0.0100
0.0200
0.0400
0.0200
0.0200R
0.0400
0.0500
0.0400
0.0500
0.0200
0.0300

23
0.0400
0.0300
0.0600
0.0300

4
0.0100
0.0200
0.0200
0.0500
0.0300
0.0200
0.0200R
0.0300
0.0300
0.0300R

0.0300
0.0200
0.0300
0.0200
0.0300R
0.0400
0.0300R
0.0400
0.0300
0.0200

2
0.0200
0.0200
0.0300
0.0200
0.0300
0.0200
0.0500
0.0300

0.0200
0.0200
0.0200
0.0300
0.0200
0.0300
0.0200
0.0200
0.0200R

14
0.0400
0.0300
0.0300
0.0300
0.0300
0.0300
0.0200
0.0300

0.0200
0.0200
0.0200
0.0400
0.0300
0.0200R
0.0200
0.0200R
0.0300
0.0300

21
0.0300
0.0200
0.0300
0.0200

22
0.0200
0.0200R
0.0200
0.0200
0.0300

p. 2C-7

K2O %

8
0.0300
0.6523
0.6049
1.1590
1.2000
0.9000
0.6652
0.6736R
1.2750
0.0300
0.0300
0.0200
0.0305
0.0300
0.0200
0.0300
0.0300
0.0500R

11
0.0300
0.0200
0.0300
0.0500
0.0300
0.0595
0.0300
0.1500
0.0100
0.0150
0.0300
0.0070
0.0150
0.0100
0.0150
0.0500

12
0.0500
0.0300
0.0300
0.0300
0.0500
0.0300
0.0050
0.3594

1
0.0200
0.0500
0.0300
0.0300
0.0645
0.0150
0.0300
0.0200
0.0746
0.0300
0.1500
0.0020
0.0300
0.0200
0.0688
0.0150

13
0.0100
0.0150
0.0500
0.1036
1.1000
0.5000
0.0518
0.0150
0.0300R
0.1000
0.1092

30
0.0150
0.0300
0.0300
0.0429

7
0.0150
0.4179
0.0300
0.0300
0.0300
0.0300
0.0700
0.5545
0.0300
0.5000
0.1489
0.4201
0.5129R
0.0300
2.3320
1.9580
2.1500

9
0.1663
0.0700
0.0200
0.0700
0.0500
0.0300
0.0300
0.0700
0.0200
0.0300
0.0300
0.0020
0.0070
0.0300
0.0100
0.0300

20
0.0300
0.0300R
0.0200
0.0300
0.0100

10
0.0300
0.1000
0.0200
0.0300
0.0200
0.0300
0.0300
0.0150R
0.0500
0.0200
0.0300R
0.0150
0.1000
0.0200
0.0300R
0.0300
0.0150
0.0200R
0.0300
0.0200R
0.0300

26
0.4252
0.0300
0.0500
0.0100

29
0.1172
0.0500
0.0700R
0.4385
0.0323

28
0.0200
0.0150
0.0300
0.0200

6
0.0020
0.0070
0.0030
0.0070
0.0200
0.0100
0.0779
0.0100
0.0664
0.0300
0.0568
0.0150
0.0100
0.0200
0.0678
0.0100

5
0.0200
0.0070
0.0200
0.1500R
0.1500
0.0300
0.0100
0.0100
0.0200
0.0300
0.0100
0.0070
0.0070R
0.0200
0.0200
0.0020
0.0070
0.0020

25
0.1167
0.0140
0.0100
0.0050
0.0070R

3
0.0300
0.0300
2.1580
0.0300
0.2000
0.2000R
0.0150
0.0100
0.4000
0.0300
0.0473
0.0387R
0.0300
0.9000
0.0200
0.0200
0.0050
0.0200

24
0.0300
0.0070
0.0200R
0.0300
0.0150

4
0.0300
0.0030
0.0020
0.0100
0.0300
0.0300
0.0300R
0.1000
0.0422
0.0300R
0.0200
0.0300
0.0300
0.0070
0.0100R
0.0070
0.0070R
0.0070
0.0100
0.0070

23
0.0150
0.0020
0.0300
0.0030

32
0.0832
0.0300
0.0500
0.0300

31
0.0140
0.0500
0.1500
0.1254
0.0356R

2
0.0300
0.0500
0.0070
0.0050
0.1012
0.0070
0.0200
0.0150
0.1500
0.1500
0.1500
0.5193
0.1248
0.5198
0.0442
0.0700
0.0700R

14
0.2675
0.2586
0.1880
0.0648
0.1163
0.0300
0.0300
0.7000
0.0200
0.0100
0.0150
0.0150
0.0150
0.0100R
0.0300
0.0200R
0.0200
0.0150

21
0.0700
0.0700
0.0300
0.0150

22
0.0200
0.0200R
0.0200
0.0500
0.1508

p. 2C-8

TiO2 %

8
0.0005 0.0003
0.1147 0.0005
0.0575 0.0003
0.3405 0.0050
0.2568 0.0010
0.3100 0.0003
0.1200 0.0300
0.1173R 0.0100
0.2101 0.0070R

11
0.0010
0.0005
0.0010
0.0015
0.0005
0.0020
0.0030
0.0200
0.0020
0.0005
0.0007
0.0020
0.0015
0.0030
0.0005
0.0015

12
0.0100
0.0070
0.0070
0.0015
0.0020
0.0005
0.0030
0.0500

1
0.0015
0.0070
0.0015
0.0010
0.0050
0.0005
0.0020
0.0005
0.0100
0.0020
0.0070
0.0003
0.0030
0.0005
0.0050
0.0005

13
0.0070
0.0050
0.0020
0.0150
0.1065
0.0635
0.0573
0.0100
0.0100R
0.0150
0.0200

30
0.0030
0.0020
0.0015
0.0300

7
0.0070 0.0300
0.1189 0.1152
0.0561 0.0200
0.0010 0.0855
0.0070 0.0619R
0.0070 0.0100
0.0100 0.3517
0.0500 0.2487
0.2794

9
0.0100
0.0050
0.0030
0.0030
0.0020
0.0020
0.0005
0.0070
0.0003
0.0005
0.0010
0.0003
0.0003
0.0100
0.0003
0.0030

20
0.0020
0.0010R
0.0003
0.0010
0.0003

10
0.0005
0.0200 0.0010R
0.0100 0.0005
0.0005 0.0100
0.0005 0.0005
0.0005 0.0010R
0.0070 0.0030
0.0005 0.0005
0.0010R 0.0005R
0.0015 0.0007
0.0005R
0.0010

26
0.0500
0.0005
0.0100
0.0005

29
0.0150
0.0050
0.0070R
0.0005
0.0003

28
0.0010
0.0003
0.0030
0.0003

6
0.0003 0.0150
0.0003 0.0050
0.0003 0.0150
0.0003 0.0003
0.0020 0.0003
0.0003 0.0003
0.0010 0.0070
0.0003 0.0003

24
0.0050
0.0003
0.0003R
0.0070
0.0003

5
0.0003 0.0020
0.0005 0.0003
0.0003 0.0003
0.0003R 0.0003R
0.0100 0.0003
0.0010 0.0007
0.0005 0.0003
0.0003 0.0003
0.0003 0.0030

25
0.0100
0.0005
0.0005
0.0003
0.0003

3
0.0050
0.0030
0.3881
0.0003
0.0546
0.0200
0.0020
0.0030
0.0500
0.0030
0.0100
0.0150R
0.0300
0.0500
0.0010
0.0020
0.0005
0.0003

23
0.0003
0.0003
0.0005
0.0003

4
0.0050 0.0003
0.0003 0.0003
0.0003 0.0003
0.0003 0.0007
0.0010 0.0003R
0.0005 0.0003
0.0005R 0.0003R
0.0509 0.0003
0.0010 0.0005
0.0020R 0.0003

32
0.0050
0.0007
0.0005
0.0005

31
0.0005
0.0030
0.0519
0.0100
0.0100R

2
0.0030 0.0150
0.0100 0.0100
0.0010 0.0300
0.0005 0.0502
0.0150 0.0578
0.0003 0.0500
0.0030 0.0100
0.0005 0.0100
0.0100R

14
0.0050
0.0200 0.0005
0.0100 0.0100
0.0150 0.0005
0.0200 0.0005
0.0100 0.0005R
0.0030 0.0100
0.0030 0.0050R
0.0020 0.0070
0.0003

21
0.0150
0.0150
0.0030
0.0003

22
0.0005
0.0010R
0.0050
0.0050
0.0511

p. 2C-9

P2O5 %

8
```
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000LR1.0000L
1.0000L 1.0000LR
```

11 12
```
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
```

1
```
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
```

13
```
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000LR
1.0000L
1.0000L
```

30
```
1.0000L
1.0000L
1.0000L
1.0000L
```

7
```
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000LR
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
        1.0000L
```

29
```
1.0000L
1.0000L
1.0000LR
1.0000L
1.0000L
```

28
```
1.0000L
1.0000L
1.0000L
1.0000L
```

9
```
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
```

20
```
1.0000L
1.0000LR
1.0000L
1.0000L
1.0000L
```

19
```
        1.0000L
1.0000L 1.0000LR
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000LR
1.0000L 1.0000L
1.0000L 1.0000L
1.0000LR1.0000LR
1.0000L 1.0000L
        1.0000LR
        1.0000L
```

26
```
1.0000L
1.0000L
1.0000L
1.0000L
```

6
```
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
```

5
```
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000LR1.0000LR
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
```

32
```
1.0000L
1.0000L
1.0000L
1.0000L
```

31
```
1.0000L
1.0000L
1.0000L
1.0000L
1.0000LR
```

3
```
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000LR
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000LR
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
1.0000L
```

24
```
1.0000L
1.0000L
1.0000LR
1.0000L
1.0000L
```

25
```
1.0000L
1.0000L
1.0000L
1.0000L
1.0000LR
```

2
```
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0950 ←
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
        1.0000LR
```

14
```
        1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000LR
1.0000L 1.0000L
1.0000L 1.0000LR
1.0000L 1.0000L
        1.0000L
```

4
```
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000LR
1.0000LR1.0000LR
1.0000L 1.0000L
1.0000L 1.0000L
1.0000L 1.0000L
1.0000LR1.0000L
```

23
```
1.0000L
1.0000L
1.0000L
1.0000L
```

21
```
1.0000L
1.0000L
1.0000L
1.0000L
```

22
```
1.0000L
1.0000LR
1.0000L
1.0000L
1.0000L
```

p. 2C-10

F %

8

```
0.0900   0.0400
0.0700   0.0400L
0.0400L  0.0400L
0.1100   0.0400
0.0600   0.0400
0.0700   0.0900
0.0400L  0.0500
0.0400 R0.0400
0.0500   0.0400LR
```

11

```
0.0400L
0.0400
0.0400L
0.0400L
0.0900
0.0400L
0.0400L
0.0400
0.0400L
0.0400
0.0400L
0.0400L
0.0400L
0.0400L
0.0400
0.0400L
```

12

```
0.0400L
0.0500
0.0400L
0.0400L
0.0400
0.0400L
0.0400L
0.0800
```

1

```
0.0400L
0.0500
0.0400L
0.0400L
0.0400
0.0400L
0.0400L
0.0400L
0.0400L
0.0600
0.0500
0.0400L
0.0400L
0.0700
0.0400L
0.0400
```

13

```
0.0400L
0.0400L
0.0400
0.0400L
0.0500
0.0400L
0.0400
0.0400L
0.0400LR
0.0400L
0.0400L
```

30

```
0.0400L
0.0400L
0.0400L
0.0400L
```

7

```
0.0400L  0.0800
0.0400   0.0400
0.0500   0.0500
0.0400L  0.0600
0.0500   0.0400 R
0.0400   0.0400L
0.0500   0.0800
0.0600   0.0700
         0.1100
```

9

```
0.0400L
0.0400L
0.0400L
0.0400L
0.0400
0.0400L
0.0400L
0.0400L
0.0400L
0.0400L
0.0400
0.0400L
0.0400L
0.0400L
0.0400L
0.0600
```

20

```
0.1000
0.0400 R
0.0400L
0.0400L
0.0700
```

10

```
         0.0400L
0.0500   0.0400LR
0.0400L  0.0900
0.0400   0.0400L
0.0600   0.0400L
0.0400L  0.0400LR
0.0400L  0.0400L
0.0400L  0.0500
0.0400 R 0.0700 R
0.0500   0.0400
         0.0400LR
         0.0500
```

26

```
0.0500
0.0400L
0.0400L
0.1000
```

29

```
0.0400
0.0500
0.0400LR
0.0500
0.0400L
```

28

```
0.0400L
0.0500
0.1200
0.0400L
```

6

```
0.0400L  0.0500
0.0400   0.0400L
0.0400L  0.0400L
0.0400L  0.0400L
0.0400L  0.0400L
0.0400L  0.0400L
0.0400L  0.0400L
0.0400L  0.0400L
```

5

```
0.0400L  0.0800
0.0400   0.0400L
0.0400L  0.0400L
0.0400LR 0.0400 R
0.0400L  0.0400L
0.0400   0.0400L
0.0400L  0.0400L
0.0400L  0.0400L
0.0400L  0.0400L
```

25

```
0.0500
0.0400L
0.0400L
0.0400
0.0400 R
```

3

```
0.0800
0.0600
0.0700
0.0400L
0.0400
0.0400LR
0.0400L
0.0400L
0.0600
0.0400L
0.0400L
0.1100 R
0.0700
0.0400L
0.0400L
0.0500
0.0400L
0.0400L
```

24

```
0.0400L
0.0400L
0.0400LR
0.0400
0.0400L
```

4

```
0.0400L  0.0400L
0.0400L  0.0400
0.0400L  0.0400L
0.0400L  0.0400L
0.0400L  0.0400LR
0.0400L  0.0400L
0.0400LR 0.0400LR
0.0700   0.0700
0.0400L  0.0400
0.0400LR 0.0900
```

23

```
0.0400L
0.0400
0.0400L
0.0700
```

32

```
0.0600
0.0400L
0.0400L
0.0400L
```

31

```
0.0400L
0.0400L
0.0900
0.0700
0.1200 R
```

2

```
0.0400L  0.0700
0.0400L  0.0400L
0.0400   0.0500
0.0400L  0.0700
0.0600   0.1300
0.0400L  0.0400
0.0400L  0.0400
0.0400L  0.0500
         0.0400LR
```

14

```
         0.0500
0.0400L  0.0400
0.0400   0.0400L
0.0800   0.0500
0.0400   0.0400L
0.0400   0.0400LR
0.0400   0.0500
0.0400   0.0600 R
0.0400L  0.0400L
         0.0400L
```

21

```
0.0400L
0.0700
0.0400
0.0400L
```

22

```
0.0400L
0.0400 R
0.0400L
0.0400L
0.0500
```

p. 2C-11

Total S %

```
                                                                      8                             11        12                  1                             13
                                                            0.0801L   0.0801L                       0.0801L   0.0801L             0.0801L                       0.0801L
                                                            0.0801L   0.0801L                       0.0801L   0.0801L             0.0801L                       0.0801L
                                                            0.0801L   0.0801L                       0.0801L   0.0801L             0.0801L                       0.0801L
                                                            0.0801L   0.0801L                       0.0801L   0.0801L             0.0801L                       0.0801L
                                                            0.0801L   0.0801L                       0.0801L   0.0801L             0.0801L                       0.0801L
                                                            0.0801L   0.0801L                       0.0801L   0.0801L             0.0801L                       0.0801L
                                                            0.0801L   0.0801L                       0.0801L   0.0801L             0.0801L                       0.0801L
                                                            0.0801LR  0.0801L                       0.0801L   0.0801L             0.0801L                       0.0801L
                                                            0.0801L   0.0801LR                      0.0801L                       0.0801L                       0.0801LR
                                                                                                    0.0801L                       0.0801L                       0.0801L
                                                                                                    0.0801L                       0.0801L                       0.0801L
                                                                                                    0.0801L             30        0.0801L
                                                                                                    0.0801L             0.0801L   0.0801L
                                                                                                    0.0801L             0.0801L   0.0801L
                                                                                                    0.0801L             0.0801L   0.0801L
                                                  7                   9         20        0.0801L             0.0801L   0.0801L
                                        0.0801L   0.0801L             0.0801L   0.0801L   10        0.0801L   26
                                        0.0801L   0.0801L             0.0801L   0.0801LR  0.0801L   0.0801LR  0.0801L
                                        0.0801L   0.0801L             0.0801L   0.0801L   0.0801L   0.0801L   0.0801L
                                        0.0801L   0.0801L             0.0801L   0.0801L   0.0801L   0.0801L   0.0801L
                                        0.0801L   0.0801LR            0.0801L   0.0801L   0.0801L   0.0801L   0.0801L
                                        0.0801L   0.0801L             0.0801L             0.0801L   0.0801LR
                                        0.0801L   0.0801L             0.0801L             0.0801L   0.0801L
                                        0.0801L   0.0801L   29        0.0801L             0.0801L   0.0801L
                                                  0.0801L   0.0801L   0.0801L             0.0801LR  0.0801LR
                                                            0.0801L   0.0801L             0.0801L   0.0801L
                                                            0.0801LR  0.0801L                       0.0801LR
                                                            0.0801L   0.0801L                       0.0801L
                                                            0.0801L   0.0801L
                              6                             28        0.0801L
                    0.0801L   0.0801L                       0.0801L   0.0801L
                    0.0801L   0.0801L                       0.0801L   0.0801L
                    0.0801L   0.0801L                       0.0801L
                    0.0801L   0.0801L                       0.0801L
                    0.0801L   0.0801L                                 5                             32        31
                    0.0801L   0.0801L                       0.0801L   0.0801L                       0.0801L   0.0801L
                    0.0801L   0.0801L                       0.0801L   0.0801L                       0.0801L   0.0801L
3                   0.0801L   0.0801L                       0.0801L   0.0801L                       0.0801L   0.0801L
                              24                  25        0.0801LR  0.0801LR                      0.0801L   0.0801L
0.0801L                       0.0801L             0.0801L   0.0801L   0.0801L                                 0.0801LR
0.0801L                       0.0801L             0.0801L   0.0801L   0.0801L             2                   14        0.0801L
0.0801L                       0.0801LR            0.0801L   0.0801L   0.0801L   0.0801L   0.0801L             0.0801L   0.0801L
0.0801L                       0.0801L             0.0801L   0.0801L   0.0801L   0.0801L   0.0801L             0.0801L   0.0801L
0.1534                        0.0801L             0.0801LR  0.0801L   0.0801L   0.0801L   0.0801L             0.0801L   0.0801L
0.0801LR                      4                                                 0.0801L   0.0801L             0.0801L   0.0801L
0.1643              0.0801L   0.0801L                                           0.0801L   0.0801L             0.0801L   0.0801LR
0.0801L             0.0801L   0.0801L                                           0.0801L   0.0801L             0.0801L   0.0801L
0.0801L             0.0801L   0.0801L                                           0.0801L   0.0801L             0.0801L   0.0801LR
0.0801L             0.0801L   0.0801L                                           0.0801L   0.0801L             0.0801L   0.0801L
0.0801L             0.0801L   0.0801LR                                                    0.0801LR                      0.0801L
0.0801LR            0.0801L   0.0801L
0.0801L             0.0801LR  0.0801LR                                                              21                  22
0.0801L   23        0.0801L   0.0801L                                                               0.0801L             0.0801L
0.0801L   0.0801L   0.0801L   0.0801L                                                               0.0801L             0.0801LR
0.0801L   0.0801L   0.0801LR  0.0801L                                                               0.0801L             0.0801L
0.0801L   0.0801L                                                                                   0.0801L             0.0801L
0.0801L   0.0801L                                                                                                       0.0801L
```

p. 2C-12

Total C %

8	
12.1800	12.2500
9.8200	~~0.6000~~ Error 12.93
10.5500	12.7200
6.2700	12.8300
5.0600	12.6000
4.9600	12.8800
8.9600	12.3800
8.9800R	12.9900
7.2600	12.9800R

11	12
12.9200	12.5900
12.7700	12.6100
12.9400	12.4300
12.8200	12.9800
12.8700	12.9500
12.7400	11.5600
12.3600	12.1800
12.6500	11.4800
12.7000	
12.7100	
11.9000	
12.6800	
12.8900	
12.9700	
12.6000	
13.0000	

30
12.9800
12.4900
12.7800
11.8000

1
12.8300
12.9300
12.4400
12.9900
12.6900
12.6200
12.4100
12.9200
12.3000
12.9800
11.9900
11.3200
12.6400
13.0000
12.2000
12.3500

13
12.8500
12.4700
11.3700
11.9100
7.9000
10.3900
12.4200
12.2800
12.3100R
12.1200
12.3500

7	
11.6200	11.9800
10.0400	10.2200
10.5000	8.2700
12.3700	10.8800
11.2800	10.8300R
11.3700	10.7600
10.2800	5.3300
9.9900	5.8100
	6.2400

9
12.4100
12.8600
12.9600
12.9800
12.1000
12.6500
12.9500
11.6700
12.7800
11.7800
12.6200
12.0300
12.9500
12.3500
12.5500
12.3300

20
12.8700
12.8400R
12.9300
12.6300
12.8000

10	
	12.3100
11.4000	12.9500R
11.5800	12.8800
12.6500	12.4300
12.8500	13.0200
12.7500	12.9900R
12.9700	12.9700
12.5400	12.9800
12.6500R	12.9900R
13.0000	13.0100
	13.0000R
	12.8200

26
11.8000
12.2400
12.3100
12.5300

29
12.4600
13.1300
13.1100R
12.4800
12.8900

28
13.0500
12.3000
12.5800
12.9500

6	
12.9600	12.0700
12.9600	12.6700
12.7500	12.2300
12.8400	13.1100
12.9600	12.6500
12.8700	12.9000
11.5600	12.8100
13.0000	12.6500

24
12.5300
12.9800
12.9900R
12.6300
12.7600

5	
12.6800	12.5700
12.7800	12.6600
12.1700	12.9000
12.9900R	12.9400R
12.6300	12.9800
12.9100	12.5000
12.7600	12.2400
12.4000	12.5600
13.0300	11.7300

25
12.0700
13.0000
12.7300
12.9500
12.8600R

3
12.4800
12.6000
6.7500
11.8500
11.7200
11.9800R
12.2500
12.5900
10.5600
12.7200
12.5700
12.6000R
11.2800
10.4100
12.9600
12.4000
12.6300
12.9600

23
12.9500
12.4100
12.8700
12.4100

4	
12.4700	13.0000
12.9300	12.8500
10.8100	12.8400
12.5500	12.6400
12.9600	12.8200R
12.7200	13.0400
12.8100R	13.0100R
12.4300	12.7100
13.0000	12.9000
12.8800R	12.1600

2	
12.9400	11.1700
12.9300	12.4500
12.9200	9.7900
12.6600	12.3800
11.8500	11.8800
12.5100	10.5100
12.5900	11.9400
12.4100	12.6700
	12.5100R

32
12.8400
12.9600
12.9400
12.9200

31
12.7600
12.6200
10.9200
11.2500
12.3500R

14	
	12.5000
11.6400	12.7600
11.3400	12.4500
12.5500	12.8700
11.4700	12.9600
12.2100	13.0100R
12.9100	12.1900
12.9700	12.9300R
13.0500	12.9500
	12.9800

21
12.4500
12.8700
13.0400
12.7600

22
12.8600
12.8300R
12.5000
12.7200
11.5700

Organic C %

8
0.0200 0.0200
0.1500 0.0200
0.1700 0.0300
0.3200 0.0500
0.0800 0.0400
0.0500 0.0300
0.0500 0.0600
0.0400R 0.0200
0.0600 0.0400R

11
0.0200
0.0100
0.0200
0.0400
0.0500
0.0200
0.0400
0.0400
0.0500
0.0400
0.0700
0.0700
0.0400
0.0400
0.0300
0.0400

12
0.0400
0.0300
0.0200
0.0200
0.0500
0.0400
0.0200
0.0400

1
0.0600
0.0400
0.0500
0.0200
0.0600
0.0400
0.0500
0.0400
0.0200
0.0400
0.0200
0.0200
0.0300
0.0400
0.0500
0.0300

13
0.0200
0.0300
0.0300
0.0300
0.0200
0.0100
0.0200
0.0300
0.0100LR
0.0200
0.0400

30
0.0300
0.0300
0.0300
0.0400

7
0.0300 0.0300
0.1600 0.1500
0.0700 0.3200
0.0300 0.1100
0.0100 0.1000R
0.1000 0.0700
0.1600 0.2200
0.1800 0.1700
0.1800

9
0.0200
0.0300
0.0200
0.0400
0.0200
0.0400
0.0300
0.0300
0.0200
0.0200
0.0500
0.0100
0.0200
0.0200
0.0700
0.0300

20
0.0200
0.0400R
0.0600
0.0100
0.0100

10
0.0400
0.0300 0.0300R
0.0300 0.0200
0.0200 0.0300
0.0500 0.0400
0.0600 0.0200R
0.0100 0.0200
0.0200 0.0100
0.0500R 0.0100R
0.0300 0.0300
0.0300R
0.0300

26
0.0300
0.0100
0.0200
0.0300

29
0.0400
0.0200
0.0300R
0.0100
0.0200

28
0.0400
0.0100
0.0500
0.0400

6
0.0200 0.0900
0.0400 0.0500
0.0500 0.0400
0.0600 0.0100
0.0300 0.0200
0.0300 0.0700
0.0500 0.1700
0.0200 0.0100

24
0.0400
0.0200
0.0200R
0.0400
0.0200

5
0.0600 0.0200
0.0100 0.0300
0.0500 0.0300
0.0600R 0.0300R
0.0300 0.0300
0.0400 0.0400
0.0500 0.0300
0.0700 0.0500
0.0600 0.0500

25
0.0700
0.0300
0.0400
0.0500
0.0500R

32
0.0300
0.0300
0.0200
0.0300

31
0.0100
0.0300
0.0400
0.0200
0.0100R

3
0.0100
0.0100
0.0600
0.0400
0.1200
0.0100R
0.0700
0.1100
0.2400
0.0100
0.0400
0.0200R
0.0200
0.0200
0.0300
0.0200
0.0400
0.0200

23
0.0500
0.0200
0.0300
0.0100

4
0.0300 0.0500
0.0200 0.0800
0.0400 0.0700
0.0700 0.0600
0.0400 0.0500R
0.0100 0.0200
0.0200R 0.0400R
0.0800 0.0300
0.0100 0.0700
0.0100LR 0.0200

2
0.0400 0.0600
0.0400 0.0400
0.0400 0.0600
0.0400 0.0500
0.0500 0.0400
0.0200 0.0400
0.0400 0.0600
0.0200 0.0300
0.0200R

14
0.0300
0.0400 0.0300
0.0300 0.0300
0.0400 0.0400
0.0200 0.0400
0.0400 0.0300R
0.0400 0.0300
0.0800 0.0400R
0.0300 0.0100
0.0300

21
0.0400
0.0300
0.0300
0.0200

22
0.0400
0.0500R
0.0200
0.0600
0.0200

Carbonate C %

8

12.1600	12.2300
9.6700	12.9100
10.3800	12.6900
5.9500	12.7800
4.9800	12.5600
4.9100	12.8500
8.9100	12.3200
8.9400R	12.9700
7.2000	12.9400R

11

12.9000
12.7600
12.9200
12.7800
11.8200
12.7200
12.3200
12.6100
12.6500
12.6700
11.8300
12.6100
12.8500
12.9300
12.5700
12.9600

12

12.5500
12.5800
12.4100
12.9600
12.9000
11.5200
12.1600
11.4400

1

12.7700
12.8900
12.3900
12.9700
12.6300
12.5800
12.3600
12.8800
12.2800
12.9400
11.9700
11.3000
12.6100
12.9600
12.1500
12.3200

13

12.8300
12.4400
11.3400
11.8800
7.8800
10.3800
12.4000
12.2500
12.3100R
12.1000
12.3100

30

12.9500
12.4600
12.7500
11.7600

7

11.5900	11.9500
9.8800	10.0700
10.4300	7.9500
12.3400	10.7700
11.2700	10.7300R
11.2700	10.6900
10.1200	5.1100
9.8100	5.6400
	6.0600

9

12.3900
12.8300
12.9400
12.9400
12.0800
12.6100
12.9200
11.6400
12.7600
11.7600
12.5700
12.0200
12.9300
12.3300
12.4800
12.3000

20

12.8500
12.8000R
12.8700
12.6200
12.7900

10

11.3700	12.2700
11.5500	12.9200R
12.6300	12.8600
12.8000	12.4000
12.6900	12.9800
12.9600	12.9700R
12.5200	12.9500
12.6000R	12.9700
12.9700	12.9800R
	12.9900
	12.9700R
	12.7900

26

11.7700
12.2300
12.2900
12.5000

29

12.4200
13.1100
13.0800R
12.4700
12.8700

28

13.0100
12.2900
12.5300
12.9100

6

12.9400	11.9800
12.9100	12.6200
12.7000	12.1900
12.7800	13.1000
12.9300	12.6300
12.8400	12.8300
11.5100	12.6400
12.9800	12.6400

5

12.6200	12.5500
12.7700	12.6300
12.1200	12.8700
12.9300R	12.9100R
12.6000	12.9500
12.8700	12.4600
12.7100	12.2100
12.3300	12.5100
12.9700	11.6800

25

12.0000
12.9700
12.6900
12.9000
12.8100R

32

12.8100
12.9300
12.9200
12.8900

31

12.7500
12.5900
10.8800
11.2300
12.3400R

3

12.4700
12.5900
6.6900
11.8100
11.6000
11.9700R
12.1800
12.4800
10.3200
12.7100
12.5300
12.5800R
11.2600
10.3900
12.9300
12.3800
12.5900
12.9400

24

12.4900
12.9600
12.9700R
12.5900
12.7400

4

12.4400	12.9500
12.9100	12.7700
10.7700	12.7700
12.4800	12.5800
12.9200	12.7700R
12.7100	13.0200
12.7900R	12.9700R
12.3500	12.6800
12.9900	12.8300
12.8800R	12.1400

23

12.9000
12.3900
12.8400
12.4000

2

12.9000	11.1100
12.8900	12.4100
12.8800	9.7300
12.6200	11.3300
11.8000	11.8400
12.4900	10.4700
12.5500	11.8800
12.3900	12.6400
	12.4900R

14

	12.4700
11.6000	12.7300
11.3100	12.4200
12.5100	12.8300
11.4500	12.9200
12.1700	12.9800R
12.8700	12.1600
12.8900	12.8900R
13.0200	12.9400
	12.9500

21

12.4100
12.8400
13.0100
12.7400

22

12.8200
12.7800R
12.4800
12.6600
11.5500

p. 2C-15

Ag ppm

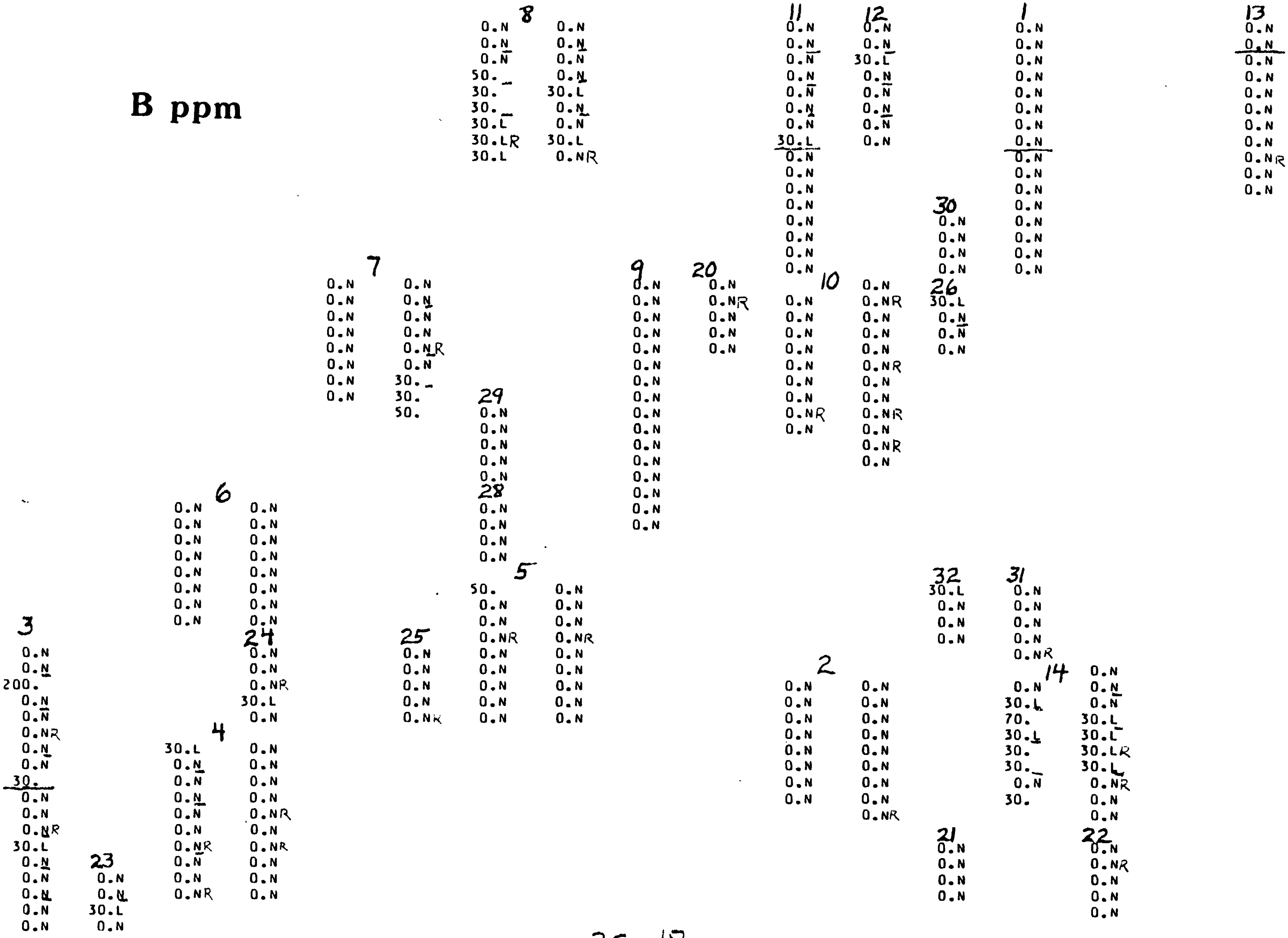
```
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N                 0.0000N                 0.0000N
                                                                                  0.0000N                 0.0000N                 0.0000N
                                                                                  0.0000N                 0.0000N                 0.0000N
                                                                                  0.0000N                 0.0000N
                                                                                  0.0000N         0.0000N 0.0000N
                                                                                  0.0000N         0.0000N 0.0000N
                                                                                  0.0000N         0.0000N 0.0000N
                                                                                  0.0000N         0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N
                                  0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                          0.0000N 0.0000N         0.0000N         0.0000N 0.0000N
                                                  0.0000N         0.0000N         0.0000N 0.0000N
                                                  0.0000N         0.0000N                 0.0000N
                                                  0.0000N         0.0000N                 0.0000N
                                                  0.0000N         0.0000N
                                                                  0.0000N
                  0.0000N 0.0000N                 0.0000N         0.0000N
                  0.0000N 0.0000N                 0.0000N         0.0000N
                  0.0000N 0.0000N                 0.0000N
                  0.0000N 0.0000N                 0.0000N
                  0.0000N 0.0000N
                  0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                  0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
  3               0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                                                  0.0000N 0.0000N                                 0.0000N 0.0000N
  0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                         0.0000N
  0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                         2                       0.0000N
  0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000NR                                                                        0.0000N 0.0000N         0.0000N 0.0000N
→ 7.0000          0.0000N 0.0000N                                                 1.0000L 0.0000N         0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                               →10.0000  0.0000N         0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                                         0.0000N                 0.0000N
  0.0000NR        0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
  0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
  0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
  0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
  0.0000N 0.0000N                                                                                                 0.0000N
  0.0000N 0.0000N
```

p. 2C-16

As ppm

```
3
1.2450
1.6250
9.4330
0.4422
0.8844
0.5096R
4.8110
1.7110
1.0820
4.5760
2.3150
2.4110R
6.8890
23.2000
0.4164
0.4762
0.9557
1.0010

23
9.5390
0.6615
3.0720
1.8740

6
0.7716   0.4194
1.6700   4.3810
0.7684   3.1130
3.9870   0.3453
1.1580   0.2105
0.1090   0.7696
1.6000   0.6381
0.6333   0.1000L

24
0.7610
1.2740
1.5040R
1.1910
0.8169

4
0.9705   1.4360
0.7608   0.6273
1.6070   0.5869
0.5821   1.0840
2.7140   0.9603R
0.6085   0.3919
0.4267R  0.4094R
1.3720   1.2620
1.4160   1.6480
1.2340R  0.8318

7
 1.6240  0.4711
 1.4780  0.4971
15.8500  0.4028
 1.9400  0.6200
 3.0750  0.7181R
15.4500  1.8360
34.9400  5.2400
 1.6970  1.6460
         1.1100

25
1.4250
1.4100
1.3280
0.5889
0.4418R

8
6.7900   1.6330
0.9962   2.4640
1.0510   1.2780
2.2410   0.8616
4.1030   0.5528
7.0280   8.4410
2.4090   2.6650
2.7390R  0.7618
1.5960   0.7997R

29
2.0350
0.4242
0.5369R
1.0220
0.2564

28
1.2560
1.8150
1.4230
0.6673

5
0.8000   1.4280
1.6840   0.8121
1.9910   1.3010
1.6890R  1.3320R
3.1040   0.5521
0.2385   1.5570
1.0670   1.8920
0.7992   4.5050
0.5889   1.2110

9
0.2477
0.7385
0.6857
1.7580
0.4033
0.1937
0.2776
0.9190
0.8447
0.9948
2.0230
0.3520
0.1000L
0.9383
0.7463
0.1000L

20
0.2095
0.2499R
0.4040
0.3562
0.2170

11
1.0230
3.3600
0.4350
1.3190
0.6247
0.4447
1.2700
0.9682
6.8390
0.1325
0.8736
3.7210
1.1990
5.2760
1.0790
0.8176

10
         0.3883
0.1000L  0.3894R
0.1000L  0.2492
0.4100   0.9887
1.0040   0.6317
0.1842   0.6427R
0.2002   0.1044
1.0180   0.1986
0.4088R  0.0000BR — Insignificant [illegible]
1.2960   0.2487
         0.1902R
         0.0000B

12
0.9544
0.8356
1.3670
1.4530
1.4590
17.1300
4.7820
5.3390

30
0.8560
0.1738
0.7202
0.5067

26
4.0310
0.7655
0.3997
3.0160

1
1.8820
0.9038
0.8422
0.8825
1.0540
0.5079
0.9742
0.8949
0.5961
2.3250
0.3967
0.7291
1.3260
0.3963
0.7868
0.8049

32
2.2030
3.1410
2.0440
2.2270

31
0.7595
0.9403
0.2194
0.7241
0.3400R

2
 1.2000  0.3585
 0.9927  0.4501
 1.7990  0.3513
 0.8945  9.2010
 5.8690  1.4050
 0.7300  3.8860
 1.5330  0.4223
13.5200  0.1852
         0.2112R

21
0.2768
0.3831
1.7730
0.7386

14
         0.8796
1.6820   0.4346
0.8836   4.9770
1.7140   2.3100
0.1000L  5.9850
4.6110   0.1000LR
0.1829   0.5591
0.8235   0.4387R
0.1620   0.5114
         0.2666

22
1.3420
1.5650R
0.9991
0.7378
4.0900

13
 4.7830
 4.3580
 2.5970
22.6600
10.2200
11.8900
11.5200
 2.2980
 8.9850R
 6.5210
12.1800
```

p.2C-17



B ppm

8
0.N 0.N 0.N 50. 30. 30. 30.L 30.LR 30.L
0.N 0.N 0.N 0.N 30.L 0.N 0.N 30.L 0.NR
11
0.N 0.N 0.N 0.N 0.N 0.N 0.N 30.L 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N
12
0.N 0.N 30.L 0.N 0.N 0.N 0.N 0.N
1
0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N
13
0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.NR 0.N 0.N
30
0.N 0.N 0.N 0.N
7
0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N
0.N 0.N 0.N 0.N 0.NR 0.N 30. 30. 50.
9
0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N
20
0.N 0.NR 0.N 0.N 0.N
10
0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.NR 0.N
0.N 0.NR 0.N 0.N 0.N 0.NR 0.N 0.N 0.NR 0.N 0.NR 0.N
26
30.L 0.N 0.N 0.N
29
0.N 0.N 0.N 0.N 0.N
28
0.N 0.N 0.N 0.N
6
0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N
0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N
5
50. 0.N 0.N 0.NR 0.N 0.N 0.N 0.N
0.N 0.N 0.N 0.NR 0.N 0.N 0.N 0.N
25
0.N 0.N 0.N 0.N 0.NR
24
0.N 0.N 0.NR 30.L 0.N
3
0.N 0.N 200. 0.N 0.N 0.NR 0.N 0.N 30. 0.N 0.N 0.NR 30.L 0.N 0.N 0.N 0.N 0.N
23
0.N 0.N 30.L 0.N
4
30.L 0.N 0.N 0.N 0.N 0.N 0.NR 0.N 0.N 0.NR
0.N 0.N 0.N 0.N 0.NR 0.N 0.NR 0.N 0.N 0.N
32
30.L 0.N 0.N 0.N
31
0.N 0.N 0.N 0.N 0.NR
2
0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N
0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.N 0.NR
14
0.N 30.L 70. 30.L 30. 30. 0.N 30.
0.N 0.N 0.N 30.L 30.L 30.LR 30.L 0.NR 0.N 0.N
21
0.N 0.N 0.N 0.N
22
0.N 0.NR 0.N 0.N 0.N

Ba ppm

8
10.
30.
30.
200.
150.
150.
150.
100. R
200.
2.N
2.N
3.
3.
5.
3.
2.N
7.
5. R

11
5.
2.N
2.
5.
2.N
2.N
3.
5.
5.
2.N
2.N
2.N
3.
2.
2.N
3.

12
2.
10.
7.
7.
5.
2.
3.
20.

1
2.
2.N
5.
15.
3.
2.N
2.N
2.N
15.
7.
2.
5.
70.
30.
2.
5.

13
7.
10.
7.
15.
70.
70.
15.
7.
7.
15.
15.

30
5.
10.
2.N
3.

7
3000.
2000.
300.
300.
30.
30.
30.
100.
300.
700.
100.
150.
150. R
150.
500.
300.
300.

9
3.
3.
2.
2.
2.N
2.N
2.N
3.
2.
2.N
2.N
2.N
5.
2.N
5.
5.

20
2.N
2.R
2.N
2.N
2.N

10
15.
2.
50.
5.
2.N
7.
2.
5. R
5.
3.
2. R
2.N
7.
2.
2. R
3.
2.N
2.NR
10.
2. R
15.

26
30.
2.N
3.
2.N

29
10.
7.
7. R
15.
2.N

28
10.
2.N
5.
20.

6
5.
2.N
2.N
2.N
5.
2.N
2.N
2.
30.
2.N
2.N
7.
7.
10.
3.
2.N

5
2.N
3.
2.N
2. R
7.
2.N
2.N
2.N
3.
2.N
2.N
2.N
2.NR
3.
5.
15.
2.N
2.

25
3.
2.N
2.
5.
7. R

24
2.N
2.N
2.N
7.
3.

3
30.
10.
200.
7.
20.
15. R
2.N
5.
70.
5.
2.N
2.NR
15.
70.
3.
5.
2.N
2.N

23
3.
2.N
5.
2.N

4
7.
2.N
2.N
10.
2.N
2.N
2.NR
10.
2.N
5. R
2.N
2.N
2.N
2.N
2.NR
30.
2.NR
2.
2.
2.N

32
10.
15.
2.N
2.N

31
2.N
5.
15.
5.
3. R

2
5.
3.
2.N
2.
15.
15.
7.
20.
10.
7.
7.
15.
3.
20.
2.
3.
5.R

14
7.
7.
3.
10.
7.
2.
2.N
2.N
2.N
2.N
3.
70.
7.
10.R
7.
7.R
7.
2.N

21
5.
5.
3.
2.

22
7.
15.R
2.
3.
15.

P. 2C-19 (20, Be, all N)

Br ppm

8

3.3230 2.7990
0.5000L 1.7190
0.5000L 4.1020
0.5000L 5.3870
0.7527 5.3930
1.6510 3.3360
0.5295 3.1660
0.5000LR 3.3960
0.8137 4.8200

11 12

8.9640 10.4000
8.5980 10.6700
6.1020 2.4880
4.7590 2.6230
4.1230 13.0600
9.8640 0.5000L
5.2150 3.6240
6.5140 0.8788
10.9400
6.0740
1.6190
4.5310
5.3130
3.6800
11.6300
12.1500

1

3.7710
4.3200
9.1700
4.5760
0.7357
6.0570
2.2140
1.2300
4.2760
2.6760
2.9350
6.0020
6.7820
0.0000B
5.3640
3.7700

13

2.4240
2.9610
1.7840
1.5010
1.8900
2.6150
2.4940
5.0860
3.9560R
7.5020
3.4890

30

0.0000B
12.2000
1.3850
2.2700

7

0.5472 0.7367
0.5145 1.2140
0.6498 0.7702
1.2750 0.5058
1.3140 0.5000LR
1.5840 0.5000L
2.5310 1.8860
0.6082 0.6234
0.7232

9

2.0370
2.6690
1.5940
6.6230
5.0530
3.6570
6.1700
8.0240
4.9760
4.8480
3.4360
5.5500
5.3550
3.1990
3.5670
6.8640

20

6.7440
5.2400R
3.7660
8.0620
9.8880

10

1.0300
1.2490 9.6080R
1.0760 4.7750
4.1180 7.3210
5.2640 7.8920
11.5300 7.3170R
5.8590 6.9060
11.4100 7.1310
12.7000R 6.5050R
10.2500 5.7760
4.8550R
4.2930

26

2.7630
9.4510
6.2720
1.4630

29

4.8080
2.8880
3.3630
3.2550
3.2290

28

4.0690
3.1320
3.4720
3.0600

6

3.0610 1.8820
2.4940 2.7580
3.0390 4.1510
2.1850 3.8620
4.1870 0.8315
3.3370 1.9440
3.0490 0.5543
5.4110 4.6410

24

4.1690
3.8330
4.3300R
4.6120
4.4310

4

2.5960 1.7620
2.5790 1.3150
1.5020 2.1400
4.2040 1.6410
1.3160 2.0320R
0.8051 3.1890
1.9770R 2.9170R
1.5630 2.3130
2.7860 4.1720
2.6930R 1.1860

3

1.5900
0.5000L
0.5000L
0.8329
0.5000L
0.5000LR
0.5000L
0.5000L
0.5000L
1.9350
1.8000
1.5300R
1.6250
1.4910
1.0310
2.3910
1.4360
2.3290

23

1.0290
1.6460
1.7590
2.0400

25

4.5070
4.9610
2.4450
3.4280
3.7210R

5

2.0340 2.1550
3.1780 1.3410
2.0740 1.8880
2.2180R 1.1520
3.5520 2.0760
4.9840 2.9920
2.5120 2.8600
3.0920 2.4060
2.1150 1.5530

32

7.0780
6.5990
9.6820
11.0900

31

9.6170
6.3030
1.8270
1.6500
1.7400R

2

1.7940 1.6670
1.5640 2.4570
2.2490 1.1670
1.3970 0.8469
1.5780 1.6430
3.7010 0.7329
3.4540 1.7460
2.4560 2.4870
2.0940R

14

4.4070
11.8500 2.6060
7.9230 4.6140
5.8830 2.8710
2.2740 6.8720
7.9120 5.7680R
4.7240 4.4760
4.6860 4.4770R
5.4700 4.9480
7.4240

21

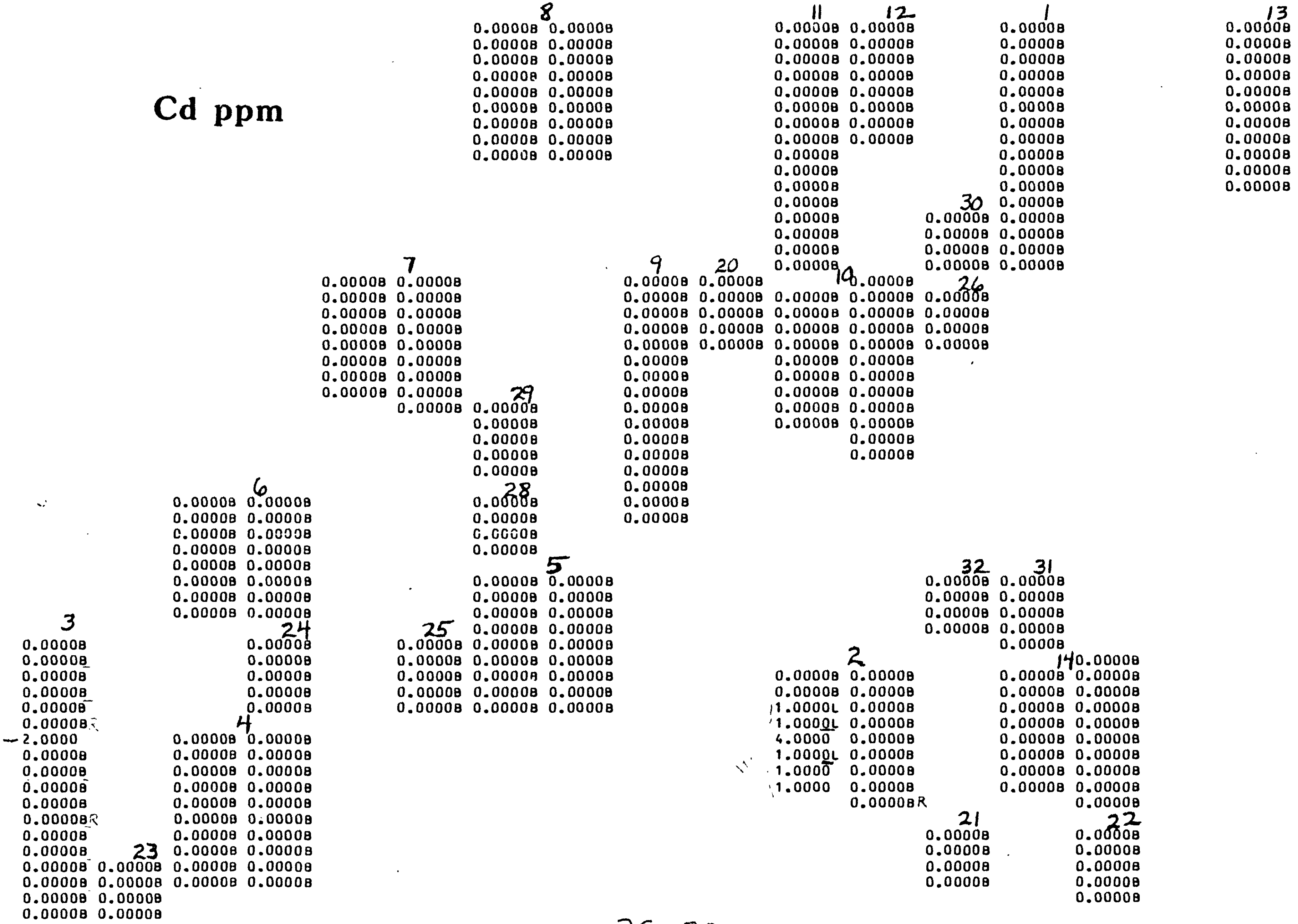
1.1640
2.0320
4.2870
3.4790

22

7.6440
2.1740R
0.8001
2.8600
1.2230

p. 2C-21

Cd ppm


8
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
11
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
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12
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0.0000B
0.0000B
1
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
13
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
30
0.0000B
0.0000B
0.0000B
0.0000B
7
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B
9
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
20
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
10
0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B
0.0000B
26
0.0000B
0.0000B
0.0000B
0.0000B
29
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
28
0.0000B
0.0000B
0.0000B
0.0000B
6
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
5
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
25
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
24
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
3
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
-2.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
23
0.0000B
0.0000B
0.0000B
0.0000B
4
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
32
0.0000B
0.0000B
0.0000B
0.0000B
31
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
2
0.0000B 0.0000B
0.0000B 0.0000B
1.0000L 0.0000B
1.0000L 0.0000B
4.0000 0.0000B
1.0000L 0.0000B
1.0000 0.0000B
1.0000 0.0000B
0.0000BR
14
0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B
21
0.0000B
0.0000B
0.0000B
0.0000B
22
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B

p. 2C-22

Co ppm

8
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
7.0000 0.0000N
0.0000N 7.0000
5.0000 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000NR

11 12
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

1
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

13
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

30
0.0000N
0.0000N
0.0000N
0.0000N

7
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N (5.0000
0.0000N 5.0000
5.0000

9
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

20
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N

10
0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000NR
0.0000N 0.0000N
0.0000NR
0.0000N

26
0.0000N
0.0000N
0.0000N
0.0000N

29
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

28
0.0000N
0.0000N
0.0000N
0.0000N

6
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0Q00N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N

5
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000NR

25
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N

32 31
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR

3
0.0000N
0.0000N
→5.0000
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

24
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

2
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR

14
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N

4
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000NR0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N

23
0.0000N
0.0000N
0.0000N
0.0000N

21
0.0000N
0.0000N
0.0000N
0.0000N

22
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N

p. 2c-23

Cr ppm

```
8
 1.5000L  1.5000L
20.0000   1.5000L
15.0000   3.0000
70.0000   1.5000
15.0000   3.0000
30.0000   1.5000
20.0000   2.0000
15.0000 R 3.0000
20.0000   3.0000 R

1.5000    2.0000
1.5000L   2.0000
1.5000L   2.0000
1.5000    2.0000
1.5000    2.0000
1.5000L   1.5000L
2.0000    3.0000
3.0000   30.0000
1.5000L
1.5000
1.5000
2.0000
1.5000
2.0000
1.5000
3.0000
       10 1.5000L
2.0000    1.5000 R
1.5000L   1.5000L
1.5000L   3.0000
0.0000N   1.5000
1.5000    1.5000 R
3.0000    2.0000
3.0000    1.5000L
2.0000 R  1.5000LR
2.0000    2.0000
          1.5000LR
          3.0000

1
1.5000L
2.0000
1.5000
2.0000
2.0000
2.0000
3.0000
1.5000L
2.0000
3.0000
3.0000
1.5000L
2.0000
2.0000
1.5000
1.5000L

30
 2.0000
 1.5000
 1.5000L
20.0000

26
15.0000
 1.5000L
 5.0000
 3.0000

13
2.0000
3.0000
3.0000
7.0000
7.0000
7.0000
7.0000
3.0000
5.0000 R
3.0000
7.0000

7
 2.0000    2.0000
15.0000   15.0000
15.0000    7.0000
 0.0000N   7.0000
 1.5000L  15.0000 R
 3.0000    3.0000
 3.0000   30.0000
10.0000   30.0000
    High  50.0000

9
2.0000
2.0000
1.5000
1.5000
3.0000
1.5000
2.0000
1.5000L
1.5000L
1.5000
1.5000L
1.5000L
1.5000L
1.5000
1.5000L
2.0000

20
1.5000L
1.5000 R
1.5000L
1.5000L
1.5000L

29
3.0000
2.0000
1.5000LR
1.5000
1.5000L

28
1.5000L
1.5000
1.5000
1.5000L

6
1.5000   10.0000
1.5000L   3.0000
1.5000L   2.0000
1.5000L   5.0000
1.5000    0.0000N
1.5000L   1.5000
1.5000L   3.0000
1.5000    1.5000L

24
1.5000L
1.5000L
1.5000LR
2.0000
2.0000

4
1.5000L   1.5000L
1.5000L   1.5000L
1.5000L   1.5000L
1.5000L   0.0000N
3.0000    1.5000LR
1.5000L   1.5000L
1.5000LR  1.5000LR
7.0000    1.5000L
1.5000L   0.0000N
2.0000 R  1.5000L

3
 2.0000
 1.5000L
70.0000
 5.0000
 7.0000
 7.0000 R
 1.5000L
 2.0000
10.0000
 1.5000
 1.5000
 1.5000LR
 7.0000
 7.0000
 2.0000
 1.5000L
 2.0000
 1.5000L

23
2.0000
1.5000L
1.5000L
1.5000L

5
         1.5000L   1.5000L
         2.0000    1.5000L
         1.5000L   0.0000N
25       1.5000 R  1.5000LR
3.0000   5.0000    1.5000L
1.5000L  1.5000L   1.5000
1.5000   1.5000L   0.0000N
0.0000N  1.5000L   1.5000L
1.5000LR 2.0000    1.5000

32
2.0000
1.5000L
1.5000L
2.0000

31
 1.5000L
 3.0000
15.0000
 5.0000
 2.0000 R

2
2.0000    2.0000
1.5000    3.0000
2.0000    7.0000
0.0000N  10.0000
2.0000    5.0000
0.0000N  10.0000
1.5000L   1.5000
2.0000    3.0000
          1.5000LR

14
          1.5000L
 3.0000   1.5000L
 3.0000   3.0000
 1.5000L  1.5000L
 3.0000   1.5000
10.0000   1.5000 R
 1.5000L  1.5000
 1.5000L  1.5000 R
 1.5000L  3.0000
          1.5000L

21
2.0000
5.0000
2.0000
1.5000

22
1.5000L
1.5000LR
1.5000L
2.0000
2.0000
```

p. 2C-24

Cu ppm

8

0.0000N	3.0000
5.0000	1.5000L
5.0000	3.0000
7.0000	0.0000N
7.0000	7.0000
7.0000	0.0000N
7.0000	7.0000
7.0000R	0.0000N
5.0000	0.0000NR

11

5.0000
2.0000
1.5000L
0.0000N
0.0000N
0.0000N
1.5000L
2.0000
~~1.5000~~
0.0000N
0.0000N
1.5000L
2.0000
1.5000L
1.5000L
1.5000

12

0.0000N
2.0000
0.0000N
1.5000L
1.5000
0.0000N
5.0000
3.0000

1

0.0000N
1.5000L
0.0000N
3.0000
3.0000
0.0000N
1.5000L
1.5000L
~~2.0000~~
3.0000
5.0000
2.0000
15.0000
7.0000
2.0000
1.5000

13

5.0000
2.0000
~~2.0000~~
5.0000
2.0000
1.5000L
5.0000
3.0000
5.0000R
1.5000L
2.0000

30

2.0000
0.0000N
1.5000L
0.0000N

7

2.0000	2.0000
5.0000	5.0000
3.0000	1.5000L
0.0000N	3.0000
1.5000L	5.0000R
1.5000L	3.0000
1.5000L	10.0000
5.0000	7.0000
	10.0000

9

0.0000N
1.5000
1.5000L
2.0000
1.5000L
2.0000
1.5000L
2.0000
~~1.5000~~
0.0000N
0.0000N
1.5000L
0.0000N
3.0000
0.0000N
1.5000L

20

1.5000L
0.0000NR
0.0000N
0.0000N
0.0000N

10

	0.0000N
0.0000N	3.0000R
0.0000N	2.0000
5.0000	0.0000N
0.0000N	0.0000N
0.0000N	0.0000NR
3.0000	1.5000
3.0000	3.0000
2.0000R	1.5000LR
1.5000	1.5000L
	0.0000NR
	5.0000

26

3.0000
0.0000N
7.0000
1.5000L

29

5.0000
1.5000L
1.5000LR
0.0000N
0.0000N

28

1.5000
0.0000N
0.0000N
1.5000L

6

0.0000N	7.0000
0.0000N	3.0000
1.5000L	3.0000
1.5000L	0.0000N
0.0000N	0.0000N
0.0000N	0.0000N
2.0000	2.0000
0.0000N	0.0000N

5

	0.0000N	0.0000N
	0.0000N	0.0000N
	0.0000N	2.0000
25	0.0000NR	3.0000R
1.5000L	2.0000	1.5000
1.5000L	1.5000L	7.0000
1.5000L	0.0000N	1.5000
0.0000N	7.0000	0.0000N
0.0000NR	1.5000L	2.0000

3

2.0000
0.0000N
10.0000
0.0000N
3.0000
2.0000R
→50.0000
1.5000L
~~3.0000~~
3.0000
1.5000L
1.5000LR
3.0000
15.0000
10.0000
0.0000N
1.5000L
1.5000L

24

0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

4

0.0000N	1.5000L
0.0000N	1.5000L
0.0000N	0.0000N
0.0000N	0.0000N
3.0000	0.0000NR
0.0000N	0.0000N
0.0000NR	0.0000NR
1.5000	1.5000L
0.0000N	0.0000N
0.0000NR	1.5000L

23

0.0000N
0.0000N
1.5000L
2.0000

32

1.5000L
3.0000
5.0000
5.0000

31

1.5000L
2.0000
7.0000
3.0000
2.0000R

2

2.0000	2.0000
1.5000	1.5000L
2.0000	3.0000
0.0000N	1.5000L
7.0000	7.0000
7.0000	5.0000
1.5000	3.0000
5.0000	2.0000
	0.0000NR

14

	2.0000
7.0000	3.0000
0.0000N	3.0000
7.0000	5.0000
5.0000	1.5000
30.0000	2.0000R
3.0000	5.0000
3.0000	5.0000R
2.0000	1.5000
	0.0000N

21

0.0000N
2.0000
1.5000
1.5000

22

0.0000N
0.0000NR
0.0000N
1.5000L
3.0000

p. 2C-25

Ga ppm

8
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
10.0000 0.0000N
7.0000  0.0000N
10.0000 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
5.0000  0.0000NR
```

11 12
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

1
```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

13
```
0.0000N
0.0000N
0.0000N
0.0000N
→7.0000
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
```

30
```
0.0000N
0.0000N
0.0000N
0.0000N
```

7
```
0.0000N 0.0000N
7.0000  0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N10.0000
0.0000N10.0000
       10.0000
```

9 20
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

10
```
        0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000N
        0.0000N
```

26
```
0.0000N
0.0000N
0.0000N
0.0000N
```

27
```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

28
```
0.0000N
0.0000N
0.0000N
0.0000N
```

6
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

5
```
0.0000N 0.0000N
0.0000N 0.0000N
7.0000  0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

25
```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

32 31
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000N
```

3
```
0.0000N
0.0000N
→15.0000
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

23
```
0.0000N
0.0000N
0.0000N
0.0000N
```

24
```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

4
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

2
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000N
```

14
```
        0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000N
```

21
```
0.0000N
0.0000N
0.0000N
0.0000N
```

22
```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

p. 2C-26

Ge ppm

8
0.1000L 0.1000L
0.1564 0.1000L
0.1616 0.1089
0.7992 0.1000L
1.0260 0.1000L
1.1650 2.0930 ←
0.4988 0.1000L
0.5474 R 0.1000L
0.5156 0.1000LR

11 12
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1913
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1068
0.1000L 1.3320
0.1119 0.1525
0.1120
0.2867
0.1000L
0.1230
0.1000L
0.9887
0.1451
0.1000L

1
0.1423
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1699
0.1000L
0.1000L
0.1000L
0.1075
0.1000L
0.1000L
0.1203

13
0.1000L
0.1000L
0.1000L
0.1723
1.6560
0.9280
0.1000L
1.0680
0.1000LR
0.1000L
0.1000L

30
0.1000L
0.1000L
0.1000L
0.1103

7
0.1000L 0.1000L
0.1504 0.1551
0.1000L 0.1000L
0.1000L 0.2077
0.1000L 0.1000LR
0.1000L 0.1000L
0.1000L 0.8012
0.1740 0.7161
0.5549

9
0.1129
0.1000L
0.1000L
0.1000L
0.1000L
0.1210
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1147
0.1000L
0.1000L

20
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L

10
0.1000L
0.1000L 0.1000LR
0.1194 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000LR
0.1000L 0.1000L
0.1292 0.1000L
0.1000LR 0.0000BR
0.1000L 0.1008
0.1000LR
0.0000B

26
0.1603
0.1000L
0.1000L
0.1000L

29
0.1000L
0.1000L
0.1000LR
0.1000L
0.1000L

28
0.1000L
0.1027
0.1297
0.1000L

6
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1608
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1111
0.1000L 0.1000L

24
0.1000L
0.1000L
0.1000LR
0.1000L
0.1000L

5
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1000LR 0.1000LR
0.1314 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1359
0.1000L 0.1309

25
0.1000L
0.1000L
0.1000L
0.1000L
0.1000LR

32
0.1000L
0.1000L
0.1000L
0.1000L

31
0.1000L
0.1000L
0.1081
0.1468
0.1219R

3
0.1000L
0.1000L
→ 0.6497
0.1000L
0.1000L
0.1000LR
0.1000L
0.1000L
0.1896
0.1000L
0.1000L
0.1385 R
0.1000L
0.1924
0.1000L
0.1530
0.1000L
0.1000L

23
1.3170
0.1000L
0.1000L
0.1000L

4
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000LR
0.1000L 0.1408
0.1000LR 0.1000LR
0.1000L 0.1000L
0.1000L 0.1000L
0.1000LR 0.1000L

2
0.1000L 0.1253
0.1000L 0.1699
0.1000L 0.3187
0.1000L 0.1000L
0.1709 0.1000L
0.1000L 0.2723
0.1000L 0.1000L
0.2442 0.1000L
0.1000LR

14
0.1000L
0.1764 0.1000L
0.1143 0.1493
0.1000L 0.1000L
0.1000L 1.1560 ←
0.1000L 0.1000LS
0.1000L 0.1000L
0.1000L 0.1000LR
0.1056 0.1000L
0.1154

21
0.1000L
0.1000L
0.1000L
0.1000L

22
0.1000L
0.1000LR
0.1000L
0.1000L
0.1078

p. 2C - 27

Hg ppm

8

0.0300	0.0100
0.0300	0.0100
0.0300	0.0100
0.0500	0.0100
0.0200	0.0100
0.1000	0.0100
0.0400	0.0100
0.0400R	0.0200
0.0200	0.0200

11

0.0100
0.0100
0.0100
0.0300
0.0100
0.0100
0.0100
0.0300
0.0200
0.0100
0.0100
0.0100
0.0100
0.0100
0.0200
0.0100L

12

0.0100
0.0100
0.0100
0.0100
0.0200
0.0100
0.0100
0.0100

1

0.0100
0.0200
0.0100
0.0200
0.0100
0.0100
0.0100
0.0200
0.0100
0.0100
0.0100
0.0100
0.0100
0.0200
0.0100
0.0100

13

0.0200
0.0200
0.0300
0.0700
0.0400
0.0600
0.0200
0.0100
0.0200R
0.0100
0.0100

30

0.0100
0.0100
0.0100
0.0100

7

0.0900	0.0200
0.0400	0.0200
0.3800	0.0200
0.1500	0.0200
0.3100	0.0100R
0.0900	0.0200
0.1100	0.0300
0.0200	0.0100
	0.0200

9

0.0100
0.0100
0.0100
0.0300
0.0100
0.0200
0.0100
0.0300
0.0200
0.0100
0.0100
0.0100
0.0100
0.0100
0.0300
0.0200

20

0.0100
0.0200R
0.0100L
0.0200
0.0100

10

	0.0100
0.0100	0.0100R
0.0300	0.0200
0.0100	0.0100
0.0100	0.0100
0.0100	0.0100R
0.0300	0.0100
0.0100	0.0100
0.0100R	0.0200R
0.0200	0.0100
	0.0100R
	0.0200

26

0.0100
0.0100
0.0100
0.0100

29

0.0100
0.0200
0.0200R
0.0100
0.0100

28

0.0800
0.0300
0.0700
0.0900

6

0.0500	0.0200
0.0600	0.0500
0.0600	0.0400
0.1000	0.0100
0.0200	0.0100L
0.0100	0.0100
0.0300	0.0100
0.0400	0.0200

5

0.0100	0.0100
0.0200	0.0200
0.0400	0.0200
0.0500R	0.0100R
0.0300	0.0200
0.0200	0.0400
0.0100	0.0200
0.0300	0.0400
0.0200	0.0400

25

0.0100
0.0200
0.0100
0.0100
0.0100R

32

0.0200
0.0200
0.0600
0.0100

31

0.0200
0.0200
0.0200
0.0300
0.0200R

3

0.0300
0.0100
0.0100
0.0100
0.0100L
0.0100R
0.0300
0.0100
0.0100L
0.0300
0.0300
0.0400R
0.0100
0.0300
0.0700
0.0200
0.0100
0.0200

24

0.0200
0.0100
0.0100R
0.0100
0.0100

2

0.0200	0.0200
0.0300	0.0200
0.0300	0.0200
0.0200	0.0100
0.0200	0.0300
0.0200	0.0400
0.0200	0.0100
0.0300	0.0200
	0.0200R

14

	0.0100
0.0100	0.0100
0.0100	0.0100
0.0300	0.0100
0.0200	0.0100
0.0700	0.0100R
0.0100	0.0100
0.0100	0.0300R
0.0200	0.0100
	0.0100

4

0.0200	0.0300
0.0100	0.0100
0.0300	0.0200
0.0100	0.0300
0.0100	0.0200R
0.0100	0.0100
0.0100R	0.0100R
0.0200	0.0100
0.0200	0.0300
0.0200	0.0100

23

0.0100
0.0200
0.0100
0.0100

21

0.0200
0.0100
0.0300
0.0300

22

0.0200
0.0100R
0.0100
0.0300
0.0100

p. 2C-28

I ppm

8
0.5000L 0.5853
0.7306 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
1.5780 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000LR 0.5000L
0.5000L 0.5000LR

11
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.6239
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L

12
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5971

1
0.5000L
0.5000L
0.5596
0.7878
0.5000L
0.5000L
0.5000L
0.5000L
1.0360
0.7353
0.8289
0.5420
1.0090
0.0000B
0.5000L
0.5502

13
0.5000L
0.7700
3.1150
2.6640
0.5000L
0.5000L
0.5000L
0.5000L
0.8142 R
0.5000L
0.5114

30
0.0000B
0.5000L
0.5000L
0.5000L

7
0.5000L 1.1020
1.0580 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5517 1.0630R
0.5000L 0.5000L
0.5000L 0.5000L
1.2430 0.5350
0.5000L

9
0.5000L
0.5212
0.5000L
0.5000L
0.7227
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L
0.5000L

20
1.3310
1.1980R
0.5000L
0.5312
0.6864

10
0.5000L 0.5000L
0.5000L 0.5000LR
0.5650 1.1770
1.3010 0.5000L
0.5000L 0.5000L
1.0950 0.6208 R
1.4750 0.5583
1.5530R 0.6252
0.5000L 0.9393R
1.0390
0.7812R
0.5000L

26
0.7717
0.5000L
0.5081
0.5000L

29
0.6897
0.6394
0.5000LR
0.5000L
0.7130

28
0.5000L
0.5000L
0.5000L
1.9000

6
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5185
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L

5
0.5000L 0.5000L
0.5000L 0.5000L
0.5632 0.5000L
0.5000LR 0.6098 R
0.5000L 0.5000L
0.5638 0.5000L
0.5000L 0.5000L
0.6095 0.5000L
0.5000L 0.5000L

25
0.5000L
0.5000L
0.5000L
0.6431
0.5079R

32
0.5000L
0.5000L
0.5000L
0.5000L

31
0.5000L
0.5000L
2.2710
0.5000L
0.5000L

3
1.1030
0.5000L
0.5000L
0.5000L
0.6061
0.7107 R
0.5000L
0.5616
0.5000L
0.5875
0.5000L
1.4080 R
0.5000L
0.5000L
0.5000L
0.9142
0.6326
0.5000L

24
0.6046
0.5000L
0.5000LR
0.5000L
0.5000L

2
0.8013 1.2900
0.7988 2.3310
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000L 0.5000L
0.5000LR

14
0.5000L 1.0510
0.5000L 1.4710
0.5000L 1.6000
0.6663 0.5000L
0.5000L 0.9536
0.6494 0.8639R
0.5000L 1.0120
0.5000L 0.9264R
1.4390
0.5000L

4
0.6731 0.5524
0.5000L 0.7092
0.5000L 0.5000L
1.6900 0.5000L
0.5000L 0.5000LR
0.5288 0.5000L
0.5000LR 0.5269 R
0.5000L 0.5000L
0.5000L 0.6924
0.5000LR 0.5000L

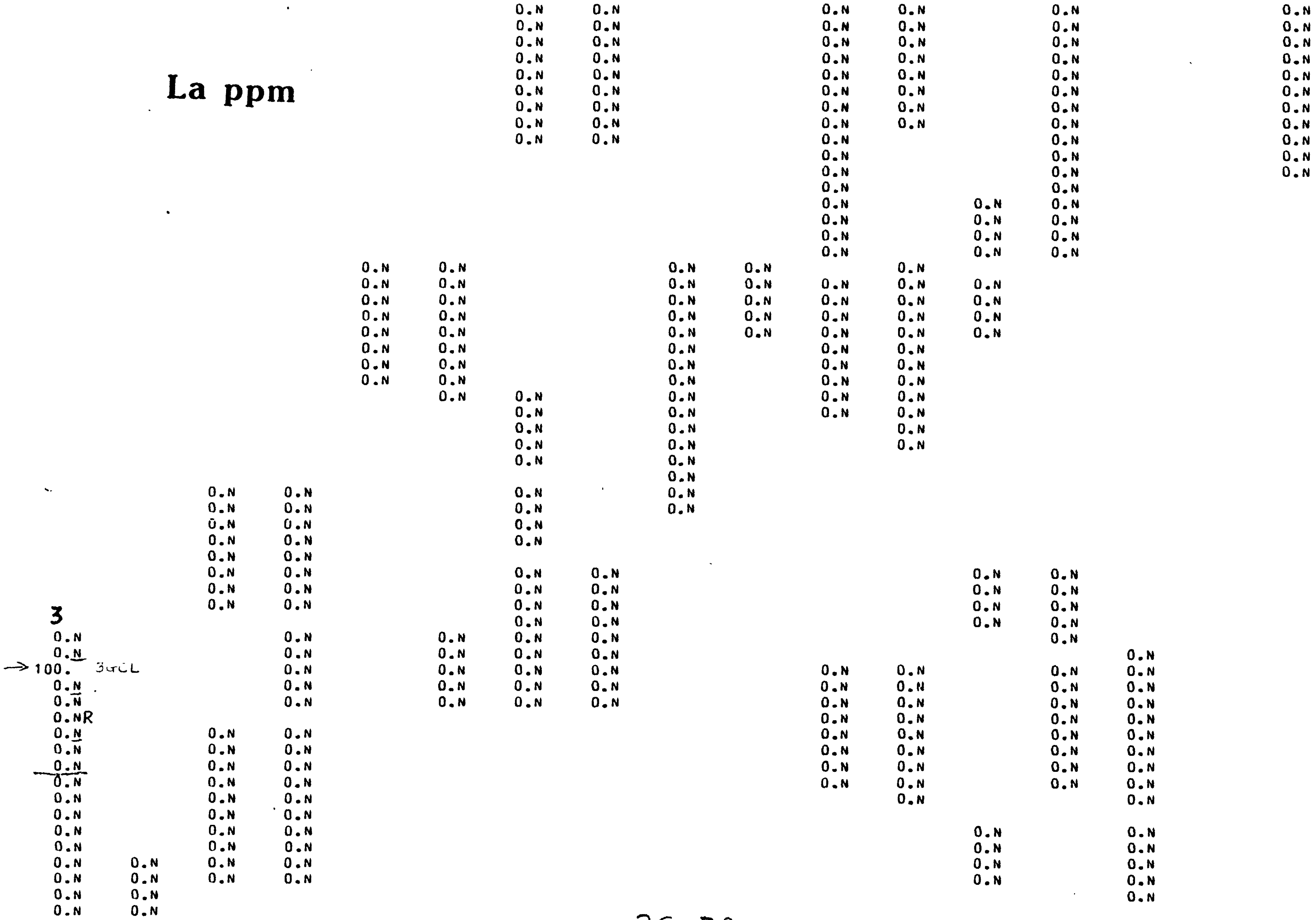
23
0.5000L
0.5000L
0.7789

21
0.5263
0.5000L
1.0260
0.5000L

22
0.5728
0.5441 R
0.5000L
0.5000L
2.2770

p. 2C-29

La ppm



P.2C-30

Li ppm

8
5.0000L 5.0000L
10.0000 5.0000L
5.0000L 5.0000L
15.0000 5.0000L
15.0000 5.0000L
15.0000 5.0000L
5.0000L 5.0000L
5.0000LR5.0000L
5.0000 5.0000LR

11 12
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L10.0000
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L

1
5.0000L
5.0000
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L

13
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000
5.0000L
5.0000L
5.0000LR
5.0000
5.0000

30
5.0000L
5.0000L
5.0000L
5.0000L

7
5.0000L 5.0000L
5.0000 5.0000
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000LR
5.0000L 5.0000L
5.0000L10.0000
5.0000L10.0000
10.0000

9
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L

20
5.0000L
5.0000LR
5.0000L
5.0000L
5.0000L

10
5.0000L
5.0000L 5.0000LR
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000LR
5.0000L 5.0000L
5.0000L 5.0000L
5.0000LR5.0000LR
5.0000L 5.0000L
5.0000LR
5.0000L

26
5.0000L
5.0000L
5.0000L
5.0000L

29
5.0000L
5.0000L
5.0000R
5.0000L
5.0000L

28
5.0000L
5.0000L
5.0000L
5.0000L

6
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L

5
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000LR5.0000LR
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L

32
5.0000L
5.0000L
5.0000L
5.0000L

31
5.0000L
5.0000L
45.0000 ← 31ACL
5.0000L
5.0000LR

3
10.0000
5.0000L
8.0000
5.0000
5.0000L
5.0000 R
5.0000L
5.0000L
5.0000
5.0000L
5.0000L
5.0000LR
5.0000L
5.0000L
5.0000L
5.0000L
5.0000L
5.0000

24
5.0000L
5.0000L
5.0000LR
5.0000L
5.0000L

25
5.0000L
5.0000L
5.0000L
5.0000L
5.0000LR

2
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000
5.0000L 5.0000
5.0000L 5.0000L
5.0000L10.0000
5.0000L 5.0000L
5.0000L 5.0000
5.0000LR

14
5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
15.0000 5.0000L
5.0000L 5.0000L
5.0000L 5.0000LR
5.0000L 5.0000L
5.0000L 5.0000LR
5.0000 5.0000L
5.0000L

4
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000L
5.0000L 5.0000LR
5.0000L 5.0000L
5.0000LR5.0000LR
5.0000L 5.0000L
5.0000L 5.0000L
5.0000LR5.0000L

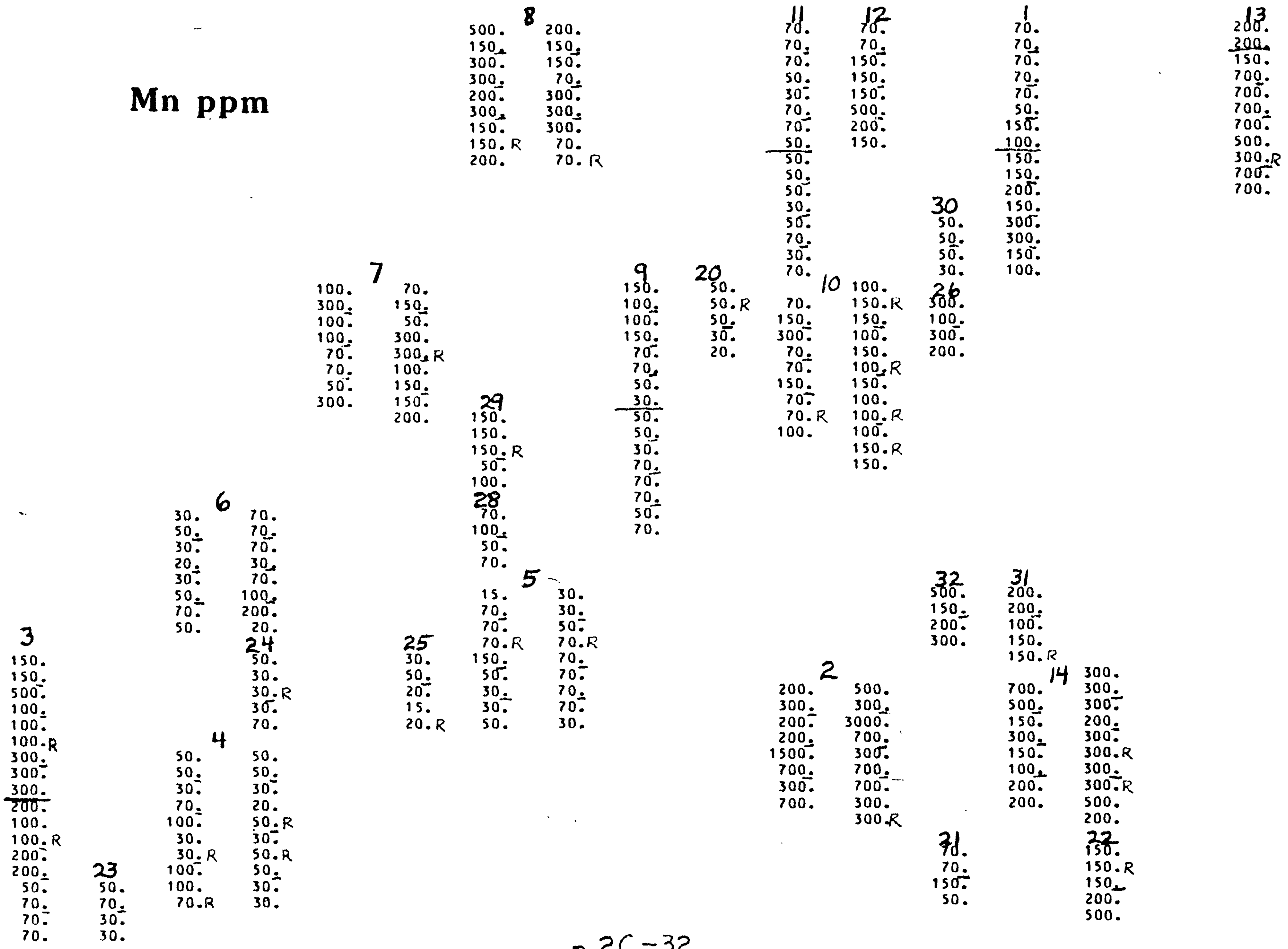
21
5.0000L
5.0000L
5.0000L
5.0000L

22
5.0000L
5.0000L
5.0000
5.0000L
5.0000L

23
5.0000L
5.0000L
5.0000L
5.0000L

p. 2C-31

Mn ppm


8
500. 150. 300. 300. 200. 300. 150. 150.R 200.
200. 150. 150. 70. 300. 300. 300. 70. 70.R
11
70. 70. 70. 50. 30. 70. 70. 50. 50. 50. 50. 30. 50. 70. 30. 70.
12
70. 70. 150. 150. 150. 500. 200. 150.
1
70. 70. 70. 70. 70. 50. 150. 100. 150. 150. 200. 150. 300. 300. 150. 100.
13
200. 200. 150. 700. 700. 700. 700. 500. 300.R 700. 700.
30
50. 50. 50. 30.
26
300. 100. 300. 200.
10
70. 150. 300. 70. 70. 150. 70. 70.R 100.
100. 150.R 150. 100. 150. 100.R 150. 100. 100.R 100. 150.R 150.
20
50. 50.R 50. 30. 20.
9
150. 100. 100. 150. 70. 70. 50. 30. 50. 50. 30. 70. 70. 70. 50. 70.
7
100. 300. 100. 100. 70. 70. 50. 300.
70. 150. 50. 300. 300.R 100. 150. 150. 200.
29
150. 150. 150.R 50. 100.
28
70. 100. 50. 70.
5
15. 70. 70. 70.R 150. 50. 30. 30. 50.
30. 30. 50. 70.R 70. 70. 70. 70. 30.
25
30. 50. 20. 15. 20.R
6
30. 50. 30. 20. 30. 50. 70. 50.
70. 70. 70. 30. 70. 100. 200. 20.
24
50. 30. 30.R 30. 70.
4
50. 50. 30. 70. 100. 30. 30.R 100. 100. 70.R
50. 50. 30. 20. 50.R 30. 50.R 50. 30. 30.
3
150. 150. 500. 100. 100. 100.R 300. 300. 300. 200. 100. 100.R 200. 200. 50. 70. 70. 70.
23
50. 70. 30. 30.
32
500. 150. 200. 300.
31
200. 200. 100. 150. 150.R
2
200. 300. 200. 200. 1500. 700. 300. 700.
500. 300. 3000. 700. 300. 700. 700. 300. 300.R
14
700. 500. 150. 300. 150. 100. 200. 200.
300. 300. 300. 200. 300. 300.R 300. 300.R 500. 200.
22
150. 150.R 150. 200. 500.
21
70. 70. 150. 50.

Mo ppm

```
8
0.0000N 0.0000N
0.0000N 7.0000
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 7.0000
0.0000NR0.0000N
0.0000N 0.0000NR

11      12
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
7.0000L 0.0000N
0.0000N 0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

1
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

30
0.0000N
0.0000N
0.0000N
0.0000N

13
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
7.0000LR
0.0000N
0.0000N

7
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N10.0000
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N10.0000
0.0000N10.0000
0.0000N 0.0000N
        0.0000N

29
0.0000N
0.0000N
0.0000NR
10.0000
7.0000

28
0.0000N
7.0000
0.0000N
0.0000N

9
0.0000N
0.0000N
15.0000
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

20
15.0000
0.0000NR
0.0000N
0.0000N
0.0000N

10
        0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
10.0000 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000NR
0.0000N 0.0000N
        0.0000NR
        0.0000N

26
0.0000N
10.0000
0.0000N
0.0000N

6
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
10.0000 0.0000N

24
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

3
0.0000N
0.0000N
0.0000N
15.0000
0.0000N
15.0000 R
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

23
0.0000N
0.0000N
0.0000N
0.0000N

4
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000NR0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
7.0000LR0.0000N

5
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N15.0000

25
0.0000N
0.0000N
0.0000N
30.0000
0.0000NR

32      31
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000NR

2
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000NR

14
        0.0000N
0.0000N 0.0000N
0.0000N20.0000
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
        0.0000N

21
0.0000N
30.0000
0.0000N
0.0000N

22
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
```

p. 2C-33(34, Nb, all N)

Nd ppm

```
                                                0.00008 0.00008                 0.00008 0.00008         0.00008                 0.00008
                                                0.00008 0.00008                 0.00008 0.00008         0.00008                 0.00008
                                                0.00008 0.00008                 0.00008 0.00008         0.00008                 0.00008
                                                0.00008 0.00008                 0.00008 0.00008         0.00008                 0.00008
                                                0.00008 0.00008                 0.00008 0.00008         0.00008                 0.00008
                                                0.00008 0.00008                 0.00008 0.00008         0.00008                 0.00008
                                                0.00008 0.00008                 0.00008 0.00008         0.00008                 0.00008
                                                0.00008 0.00008                 0.00008 0.00008         0.00008                 0.00008
                                                0.00008 0.00008                 0.00008                 0.00008                 0.00008
                                                                                0.00008                 0.00008                 0.00008
                                                                                0.00008                 0.00008                 0.00008
                                                                                0.00008                 0.00008
                                                                                0.00008         0.00008 0.00008
                                                                                0.00008         0.00008 0.00008
                                                                                0.00008         0.00008 0.00008
                                                                                0.00008         0.00008 0.00008
                                0.00008 0.00008                 0.00008 0.00008         0.00008
                                0.00008 0.00008                 0.00008 0.00008 0.00008 0.00008 0.00008
                                0.00008 0.00008                 0.00008 0.00008 0.00008 0.00008 0.00008
                                0.00008 0.00008                 0.00008 0.00008 0.00008 0.00008 0.00008
                                0.00008 0.00008                 0.00008 0.00008 0.00008 0.00008 0.00008
                                0.00008 0.00008                 0.00008         0.00008 0.00008
                                0.00008 0.00008                 0.00008         0.00008 0.00008
                                0.00008 0.00008                 0.00008         0.00008 0.00008
                                        0.00008 0.00008         0.00008         0.00008 0.00008
                                                0.00008         0.00008         0.00008 0.00008
                                                0.00008         0.00008                 0.00008
                                                0.00008         0.00008                 0.00008
                                                0.00008         0.00008
                                                                0.00008
                0.00008 0.00008                 0.00008         0.00008
                0.00008 0.00008                 0.00008         0.00008
                0.00008 0.00008                 0.00008
                0.00008 0.00008                 0.00008
                0.00008 0.00008
                0.00008 0.00008                 0.00008 0.00008                                 0.00008 0.00008
                0.00008 0.00008                 0.00008 0.00008                                 0.00008 0.00008
                0.00008 0.00008                 0.00008 0.00008                                 0.00008 0.00008
  3                                             0.00008 0.00008                                 0.00008 0.00008
0.00008                 0.00008         0.00008 0.00008 0.00008                                         0.00008
0.00008                 0.00008         0.00008 0.00008 0.00008                                                 0.00008
0.0000N ←               0.00008         0.00008 0.00008 0.00008                 0.00008 0.00008         0.00008 0.00008
0.00008                 0.00008         0.00008 0.00008 0.00008                 0.00008 0.00008         0.00008 0.00008
0.00008                 0.00008         0.00008 0.00008 0.00008                 0.00008 0.00008         0.00008 0.00008
0.00008                                                                         0.00008 0.00008         0.00008 0.00008
0.00008         0.00008 0.00008                                                 0.00008 0.00008         0.00008 0.00008
0.00008         0.00008 0.00008                                                 0.00008 0.00008         0.00008 0.00008
0.00008         0.00008 0.00008                                                 0.00008 0.00008         0.00008 0.00008
0.00008         0.00008 0.00008                                                 0.00008 0.00008         0.00008 0.00008
0.00008         0.00008 0.00008                                                         0.00008                 0.00008
0.00008         0.00008 0.00008
0.00008         0.00008 0.00008                                                                 0.00008         0.00008
0.00008         0.00008 0.00008                                                                 0.00008         0.00008
0.00008 0.00008 0.00008 0.00008                                                                 0.00008         0.00008
0.00008 0.00008 0.00008 0.00008                                                                 0.00008         0.00008
0.00008 0.00008                                                                                                 0.00008
0.00008 0.00008
```

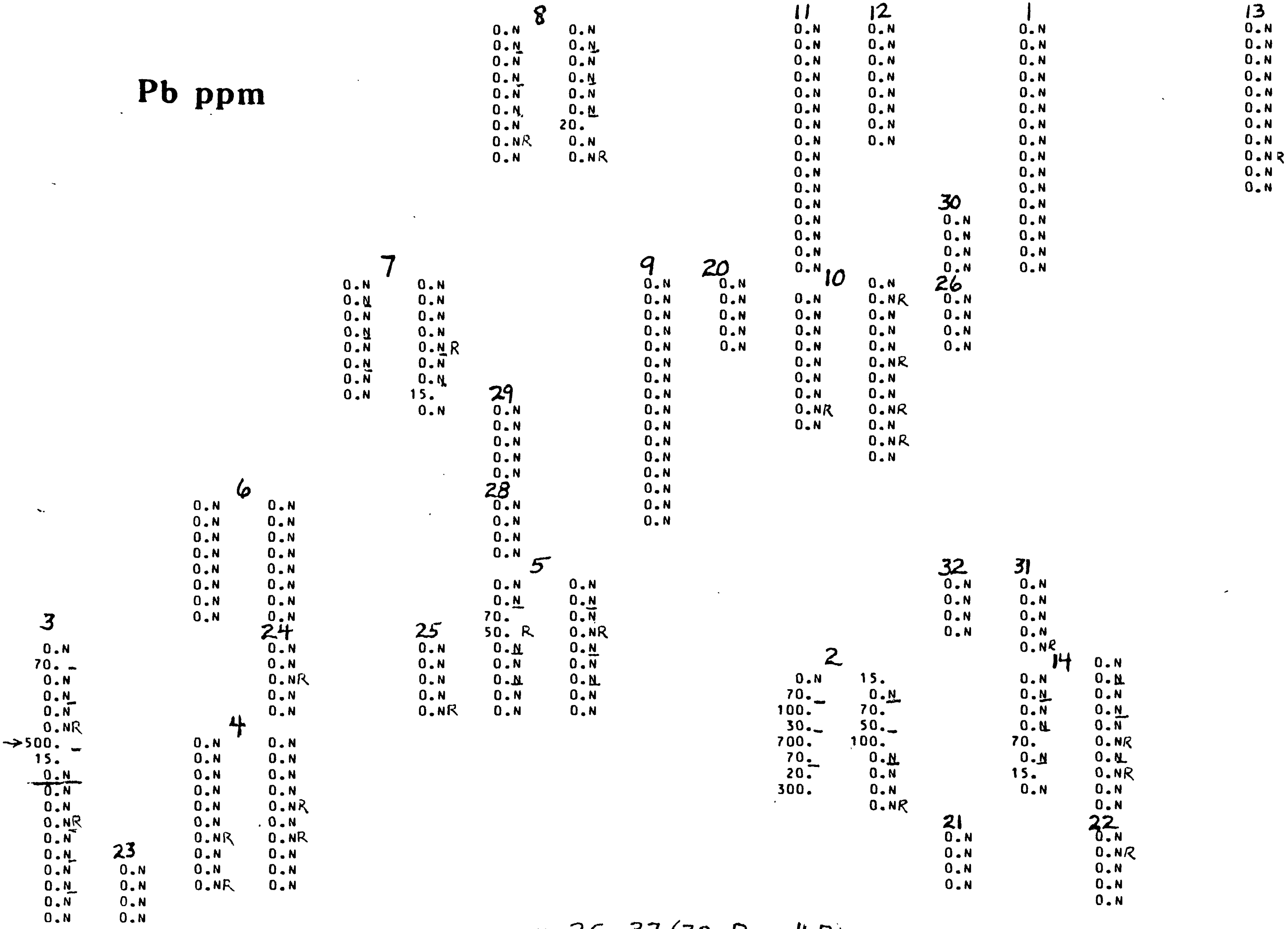
p. 2C-35

Ni ppm

```
                                                         8                            11      12              1                      13
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 7.0000  0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                30.0000  0.0000N                 0.0000N 0.0000N         0.0000N                 7.0000
                                                15.0000  5.0000                  0.0000N 0.0000N         0.0000N                 7.0000
                                                15.0000  0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                15.0000  0.0000N                 0.0000N 0.0000N         0.0000N                 7.0000
                                                10.0000 R0.0000N                 5.0000  7.0000          0.0000N                 0.0000N
                                                10.0000  0.0000NR                0.0000N                 0.0000N                 7.0000 R
                                                                                 0.0000N                 0.0000N                 0.0000N
                                                                                 0.0000N                 0.0000N                 0.0000N
                                                                                                   30
                                                                                 0.0000N                 0.0000N
                                                                                 0.0000N         0.0000N 0.0000N
                                                                                 0.0000N         0.0000N 0.0000N
                                                                                 0.0000N         0.0000N 0.0000N
                                                                                 0.0000N         0.0000N 0.0000N
                                          7                           9     20         10          26
                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N
                                 0.0000N 0.0000N                 0.0000N 0.0000NR0.0000N 0.0000NR0.0000N
                                 0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                 0.0000N 7.0000                  0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                 0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                 0.0000N 7.0000                  0.0000N         0.0000N 0.0000NR
                                 0.0000N10.0000                  0.0000N         0.0000N 0.0000N
                                 0.0000N 7.0000                  0.0000N         0.0000N 0.0000N
                                                     29
                                         7.0000  0.0000N         0.0000N         0.0000NR0.0000NR
                                                 0.0000N         0.0000N         0.0000N 0.0000N
                                                 0.0000NR        0.0000N                 0.0000NR
                                                 0.0000N         0.0000N                 0.0000N
                                                 0.0000N         0.0000N
                          6                           28
                                                                 0.0000N
                 0.0000N 7.0000                  0.0000N         0.0000N
                 0.0000N 0.0000N                 0.0000N         0.0000N
                 0.0000N 0.0000N                 0.0000N
                 0.0000N 0.0000N                 0.0000N
                                                          5                                        32      31
                 0.0000N 0.0000N
                 0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                 0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                 0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 7.0000
      3                       24              25
                                                 0.0000NR0.0000NR                                0.0000N 0.0000N
 0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                         0.0000NR
                                                                                         2
 0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                               140.0000N
20.0000                  0.0000NR        0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 7.0000
 0.0000N                 0.0000N         0.0000NR0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 7.0000
                          4
 0.0000NR                                                                        0.0000N 0.0000N         0.0000N10.0000
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000NR
 0.0000N         0.0000N 0.0000N                                                 0.0000N 7.0000          0.0000N 0.0000N
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000NR
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000N         0.0000N 0.0000NR                                                        0.0000NR                0.0000N
 0.0000NR        0.0000N 0.0000N
                                                                                                   21              22
 0.0000N         0.0000NR0.0000NR                                                                0.0000N         0.0000N
 0.0000N     23  0.0000N 0.0000N                                                                 0.0000N         0.0000NR
 0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
 0.0000N 0.0000N 0.0000NR0.0000N                                                                 0.0000N         0.0000N
 0.0000N 0.0000N                                                                                                 0.0000N
 0.0000N 0.0000N
```

p. 2C-36

Pb ppm



p. 2C-37 (38, Pr, all B)

Rb ppm

```
8
 5.0000    5.0000L
20.0000   10.0000
15.0000    5.0000L
30.0000    5.0000L
25.0000    5.0000L
25.0000    5.0000L
20.0000    5.0000L
20.0000R   5.0000
25.0000    5.0000R

11         12
 5.0000L    5.0000L
 5.0000     5.0000L
10.0000     5.0000L
 5.0000L    5.0000L
 5.0000L    5.0000L
 5.0000     5.0000L
 5.0000L    5.0000L
 5.0000    20.0000
 5.0000L
 5.0000L
 5.0000
 5.0000L
 5.0000L
 5.0000L
 5.0000L
 5.0000L

1
 5.0000L
10.0000
 5.0000
 5.0000L
 5.0000
 5.0000L
10.0000
10.0000
 5.0000L
 5.0000L
 5.0000
 5.0000L
 5.0000L
 5.0000L
 5.0000
 5.0000L

13
 5.0000L
 5.0000L
 5.0000L
10.0000
20.0000
30.0000
 5.0000
 5.0000L
 5.0000LR
10.0000
 5.0000

30
5.0000L
5.0000L
5.0000
5.0000

7
 5.0000L 10.0000
20.0000  20.0000
10.0000  10.0000
 5.0000L 20.0000
 5.0000  20.0000R
 5.0000   5.0000
 5.0000L 70.0000
30.0000  70.0000
         40.0000

9
10.0000
 5.0000
 5.0000L
 5.0000L
 5.0000
 5.0000L
10.0000
10.0000
 5.0000L
 5.0000
 5.0000
10.0000
 5.0000L
 5.0000
 5.0000L
 5.0000L

20
5.0000
5.0000LR
5.0000L
5.0000L
5.0000

10
            5.0000L
 5.0000L    5.0000R
 5.0000L    5.0000
 5.0000L    5.0000
 5.0000L    5.0000L
 5.0000L    5.0000R
 5.0000L    5.0000L
10.0000     5.0000
 5.0000LR   5.0000R
 5.0000L    5.0000L
            5.0000R
            5.0000L

26
10.0000
20.0000
 5.0000
 5.0000L

29
10.0000
10.0000
10.0000R
 5.0000
 5.0000

28
 5.0000L
10.0000
 5.0000L
10.0000

6
5.0000L  5.0000L
5.0000L 10.0000
5.0000   5.0000
5.0000L  5.0000L
5.0000L  5.0000L
5.0000   5.0000L
5.0000   5.0000
5.0000L 10.0000

5
 5.0000     5.0000L
 5.0000L    5.0000
20.0000     5.0000L
 5.0000LR   5.0000LR
 5.0000L    5.0000L
 5.0000     5.0000L
 5.0000     5.0000L
 5.0000     5.0000L
 5.0000L    5.0000L

3
 5.0000
 5.0000
60.0000
 5.0000
 5.0000
20.0000R
 5.0000
 5.0000
50.0000
 5.0000L
 5.0000
 5.0000R
10.0000
40.0000
 5.0000L
 5.0000L
 5.0000L
 5.0000L

24
 5.0000
 5.0000
10.0000R
 5.0000L
 5.0000L

25
10.0000
15.0000
 5.0000L
 5.0000L
 5.0000LR

4
 5.0000L    5.0000
 5.0000     5.0000L
 5.0000L    5.0000L
 5.0000L    5.0000L
 5.0000L    5.0000R
 5.0000     5.0000L
10.0000R    5.0000R
 5.0000L    5.0000L
 5.0000     5.0000L
 5.0000LR   5.0000

23
5.0000L
5.0000
5.0000L
5.0000

32         31
 5.0000    10.0000
 5.0000L    5.0000L
15.0000    25.0000
20.0000    10.0000
           10.0000R

2
 5.0000L  5.0000
 5.0000L  5.0000
 5.0000  15.0000
 5.0000L 30.0000
10.0000  10.0000
 5.0000L 25.0000
 5.0000L  5.0000
 5.0000L 10.0000
         15.0000R

           14 5.0000L
10.0000    15.0000
10.0000    10.0000
10.0000     5.0000L
 5.0000L    5.0000L
 5.0000     5.0000LR
10.0000     5.0000
30.0000     5.0000R
10.0000     5.0000L
            5.0000L

21
5.0000
5.0000L
5.0000L
5.0000L

22
 5.0000L
10.0000R
15.0000
 5.0000L
10.0000
```

p.2C-39

Sb ppm

```
        8
 1.0000L 0.0000B
 1.0000L 0.0000B
→2.4470  0.0000B
 0.0000B 0.0000B
→1.7690  0.0000B
→1.4160  0.0000B
 0.0000B 0.0000B
 0.0000BR0.0000B
 0.0000B 1.0000LR
```

```
                                11      12                1                               13
                           0.0000B 1.0000L           0.0000B                         0.0000B
                          →1.0780  0.0000B           1.0000L                         0.0000B
                           0.0000B 0.0000B           0.0000B                         1.0000L
                           1.0000L 0.0000B           0.0000B                         0.0000B
                           0.0000B→3.3650            1.0000L                         1.0000L
                           1.0000L 0.0000B           0.0000B                         1.0000L
                           0.0000B 0.0000B           0.0000B                         0.0000B
                           1.0000L 0.0000B           1.0000L                         0.0000B
                           0.0000B                   0.0000B                         0.0000BR
                           0.0000B                   1.0000L                         1.0000L
                           0.0000B                   1.0000L                         0.0000B
                           0.0000B               30  0.0000B
                           0.0000B           0.0000B 0.0000B
                           0.0000B           0.0000B 0.0000B
                           0.0000B           1.0000L 0.0000B
      9       20          →1.5050       10   0.0000B 0.0000B
 1.0000L 2.4300                    0.0000B      26
 1.0000L 1.0000LR0.0000B   0.0000BK0.0000B
 1.0000L 0.0000B 0.0000B   1.0000L 1.0000L
 1.0000L 1.0000L 1.0000L   1.0000L 1.0000L
 1.0000L 1.0000L 1.0000L   0.0000B 0.0000B
 0.0000B         0.0000B   0.0000BR
 0.0000B         0.0000B   0.0000B
 1.0000L         1.0000L   1.0000L
 0.0000B         1.0000LR0.0000BR
 0.0000B         1.0000L   0.0000B
 0.0000B                   0.0000BR
 1.0000L                   0.0000B
 0.0000B
 0.0000B
 0.0000B
 0.0000B
```

```
        7
 0.0000B 1.0000L
 0.0000B 1.0000L
 0.0000B 1.0000L
 0.0000B 1.0000L
 1.0000L→2.6180 R
 1.0000L 0.0000B
→1.3890  0.0000B       29
 0.0000B 0.0000B
         1.0000L 0.0000B
                 1.0000L
                 1.0000LR
                 0.0000B
                 1.0000L
                   28
                 0.0000B
                 0.0000B
                 0.0000B
                 1.0000L
                        5
                 0.0000B 0.0000B
                 0.0000B 1.0000L
                 0.0000B 1.0000L
             25  1.0000LR0.0000BR
         0.0000B 1.0000L 0.0000B
         1.0000L 1.0000L 0.0000B
         1.0000L→2.2380  0.0000B
         1.0000L 1.0000L 0.0000B
         0.0000BR0.0000B 1.0000L
```

```
                              6
                      0.0000B 0.0000B
                      0.0000B 0.0000B
                      0.0000B 1.0000L
                      0.0000B 0.0000B
                      0.0000B 0.0000B
                      0.0000B 0.0000B
                      1.0000L 0.0000B
       3              1.0000L 0.0000B
                                24
  0.0000B                     1.0000L
→24.8700                      0.0000B
  0.0000B                     0.0000BR
  1.0000L                     0.0000B
  1.0000L                     0.0000B
  1.0000LR                      4
→45.8100              0.0000B 1.0000L
  0.0000B             1.0000L 1.0000L
  1.0000L             0.0000B 0.0000B
  0.0000B             0.0000B 1.0000L
  0.0000B             1.0000L 1.0000LR
  1.0000LR            0.0000B 0.0000B
  0.0000B             1.0000LR1.0000LR
  1.0000L     23      1.0000L 0.0000B
  0.0000B 0.0000B     1.0000L 1.0000L
  0.0000B 1.0000L     0.0000BR1.3950
  0.0000B 0.0000B            ↗
  1.0000L 1.0000L
```

```
                             32      31
                         0.0000B 1.0000L
                         0.0000B 1.0000L
                         1.0000L 1.0000L
                         1.0000L 1.0000L
                                 1.0000LR
            2                        14 0.0000B
 1.0000L 1.0000L                 0.0000B 0.0000B
 1.0000L 1.0000L                 0.0000B 1.0000L
 1.0000L 0.0000B                →1.1910  0.0000B
 1.0000L 0.0000B                 0.0000B 0.0000B
 0.0000B 1.0000L                 0.0000B 0.0000B R
 0.0000B 0.0000B                 0.0000B 0.0000B
 0.0000B 0.0000B                 0.0000B 1.0000LR
 0.0000B 1.0000L                 1.0000L 0.0000B
         1.0000LR                        0.0000B
                            21             22
                        →1.4510          1.0000L
                         1.0000L         0.0000BR
                         1.0000L         1.0000L
                         1.0000L         1.0000L
                                         1.0000L
```

p.2C-40

Sc ppm

```
                                                         8
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 →7.0000  0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000NR0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                  0.0000N 0.0000N                 0.0000N                 0.0000N                 0.0000N
                                                                                  0.0000N                 0.0000N                 0.0000N
                                                                                  0.0000N                 0.0000N                 0.0000N
                                                                                  0.0000N                 0.0000N
                                                                                  0.0000N         0.0000N 0.0000N
                                                                                  0.0000N         0.0000N 0.0000N
                                                                                  0.0000N         0.0000N 0.0000N
                                          7                                       0.0000N         0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N
                                  0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                  0.0000N→0.7000L                 0.0000N         0.0000N 0.0000N
                                  0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                          0.0000N 0.0000N         0.0000N         0.0000N 0.0000N
                                                  0.0000N         0.0000N         0.0000N 0.0000N
                                                  0.0000N         0.0000N                 0.0000N
                                                  0.0000N         0.0000N                 0.0000N
                                                  0.0000N         0.0000N
                                                                  0.0000N
                  0.0000N 0.0000N                 0.0000N         0.0000N
                  0.0000N 0.0000N                 0.0000N         0.0000N
                  0.0000N 0.0000N                 0.0000N
                  0.0000N 0.0000N                 0.0000N
                  0.0000N 0.0000N
                  0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                  0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                  0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
    3                                             0.0000N 0.0000N                                 0.0000N 0.0000N
  0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                         0.0000N
  0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                                 0.0000N
→ 7.0000                  0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N                                                                         0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                                         0.0000N                 0.0000N
  0.0000N         0.0000N 0.0000N
  0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
  0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
  0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
  0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
  0.0000N 0.0000N                                                                                                 0.0000N
  0.0000N 0.0000N
```

p.2C-41

Se ppm

8
```
0.1000L 0.1000L
0.1453  0.1000L
0.1000L 0.1000L
0.1377  0.1000L
0.2214  0.1000L
0.1810  0.1000L
0.1000L 0.1805
0.1000LR0.1000L
0.1000L 0.1000LR
```

11
```
0.1000L
0.1000L
0.1377
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1291
0.1000L
0.1121
0.1294
0.1000L
0.1000L
0.1000L
0.2452
```

12
```
0.8659
0.1000L
0.1000L
0.1000L
0.1000L
0.1718
0.1000L
0.1000L
```

1
```
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1977
0.1000L
0.1000L
0.1000L
0.1000L
0.2347
0.1000L
0.1000L
0.1363
0.1000L
```

13
```
0.1000L
0.1000L
0.1000L
0.1000L
0.1593
0.1500
0.1000L
0.1000L
0.1000LR
0.4931
0.1913
```

30
```
0.1000L
0.3036
0.1000L
0.1413
```

7
```
0.1000L 0.1925
0.1000L 0.1000L
0.3383  0.1000L
0.1000L 0.1000L
0.1000L 0.1000LR
0.1000L 0.1196
0.1000L 0.1000L
0.1060  0.1000L
        0.2182
```

9
```
0.1963
0.1222
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1000L
0.1040
```

20
```
0.1000L
0.1023R
0.1000L
0.1000L
0.1000L
```

10
```
        0.1000L
0.1000L 0.1903R
0.1000L 0.2162
0.1556  0.1195
0.1000L 0.1000L
0.1000L 0.1000LR
0.1000L 0.1000L
0.1000L 0.1000L
0.1415R 0.0000BR
0.1000L 0.1000L
        0.1000LR
        0.0000B
```

26
```
0.1000L
0.1050
0.1000L
0.1000L
```

29
```
0.1491
0.1000L
0.1000LR
0.1002
0.1000L
```

28
```
0.1000L
0.1000L
0.1000L
0.1000L
```

6
```
0.1000L 0.1000L
0.1000L 0.1194
0.1000L 0.1738
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1983  0.1000L
0.1000L 0.1000L
```

5
```
0.1000L 0.1000L
0.1000L 0.1036
0.1000L 0.1000L
0.1336R 0.1000LR
0.1261  0.1000L
0.1000L 0.1000L
0.2708  0.2765
0.1000L 0.1000L
0.1000L 0.1000L
```

3
```
0.1000L
0.1000L
0.1000L
0.1000L
0.2291
0.1000LR
0.1000L
0.1000L
0.1000L
0.1175
0.1000L
0.2721 R
0.2632
0.1486
0.1000L
0.1000L
0.1000L
0.1000L
```

24
```
0.1000L
0.1000L
0.1000LR
0.1000L
0.1000L
```

25
```
0.1000L
0.1000L
0.1387
0.1000L
0.1000L
```

4
```
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000LR
0.1000L 0.1000L
0.1000LR0.1000LR
0.1000L 0.1000L
0.1057  0.1000L
0.1000LR0.1000L
```

23
```
0.1000L
0.1000L
0.1000L
0.1000L
```

32
```
0.1000L
0.1000L
0.1000L
0.1000L
```

31
```
0.1000L
0.3108
0.1000L
0.1755
0.1000LR
```

2
```
0.2258  0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1216
0.1834  0.1000L
0.1000L 0.1000L
0.1000L 0.1348
0.2079  0.1000L
        0.1000LR
```

14
```
        0.1745
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.1000L 0.1000L
0.2807  0.1000LR
0.1000L 0.1000L
0.1504  0.1075R
0.1000L 0.1000L
        0.1000L
```

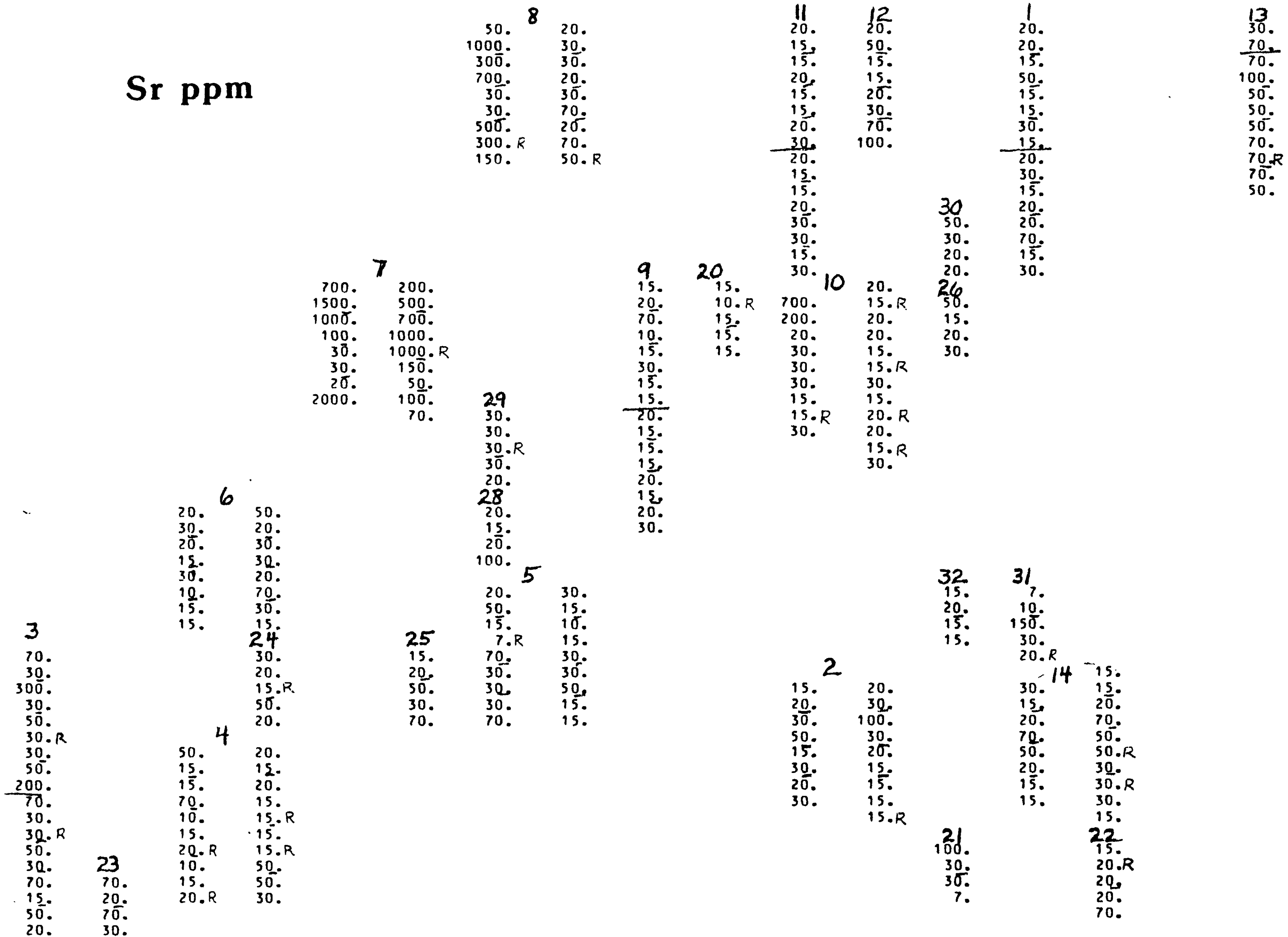
21
```
0.1000L
0.1000L
0.1000L
→1.4000
```

22
```
0.1000L
0.1038R
0.1000L
0.1000L
0.1929
```

Sn ppm

```
8
0.1152
0.5407
0.1000L
1.5480
0.6403
0.4033
0.3896
0.3687R
2.3930

0.1643
0.2341
0.2538
0.1828
0.1541
0.6829
1.0210
0.1000L
0.4848R

11
0.2799
0.1000L
0.5749
0.1000L
0.1000L
0.4448
0.1000L
0.2333
0.1000L
0.3984
0.1177
0.1383
0.1518
1.2030
0.1000L
0.1000L

12
0.1000L
0.1815
0.1000L
0.1000L
6.6170
→4.3700
1.2700
0.4010

1
0.4528
0.1000L
0.3497
0.1000L
0.1000L
0.8825
0.2849
0.1000L
0.1044
0.5741
0.1000L
0.6076
0.5608
0.2379
0.5261
0.2521

13
0.1000L
0.1453
0.1000L
0.2853
0.3553
0.3403
0.1000L
1.8900
0.1000LR
0.1000L
0.2222

30
0.1000L
0.1000L
0.1000L
0.2127

7
0.2928
0.5647
0.1000L
0.1523
0.1000L
0.7537
0.2480
0.2975

0.3474
9.6570
0.1600
0.1000L
0.1886R
0.2155
1.1520
0.7647
0.5471

9
0.1000L
0.3853
0.4697
0.8715
0.1000L
0.1000L
0.1093
0.1000L
0.1000L
0.1000L
0.2932
0.1000L
1.5460
0.2838
0.1000L
0.1000L

20
0.1000L
0.5531R
0.2155
0.1000L
0.5467

10
0.1000L
21.5300
0.1000L
0.4777
0.1398
0.1000L
0.1000L
2.9200R
0.4174

0.3347
0.5232R
0.7361
0.3647
0.1000L
0.3011R
0.1000L
0.3312
0.00008R
0.1452
0.1000LR
0.00008

26
0.4769
0.1000L
0.5554
0.1000L

29
0.9141
0.1000L
0.1000LR
0.2743
0.3147

28
0.1000L
0.1000L
0.2527
0.1000L

6
0.1000L
0.1308
0.1022
0.1000L
0.1000L
0.4777
0.6013
0.8469

0.2349
0.2789
0.1000L
0.1000L
0.1000L
0.1000L
0.3277
0.3279

5
0.1000L
0.6197
0.1720
0.1000LR
0.3618
1.8560
0.1000L
0.2344
0.1306

0.5994
1.0530
2.1440
0.4131R
0.2978
0.2760
0.1000L
0.1000L
0.3006

32
0.2212
0.1000L
0.1864
0.3158

31
0.6034
0.2958
15.2000
0.4865
2.0220R

3
0.1000L
0.3068
1.0100
0.1000L
0.1702
0.3574R
→5.3920
0.1197
0.4302
0.6953
0.1297
0.4123R
0.1352
0.1000L
0.1000L
0.3731
0.1000L
0.9481

24
0.3715
0.5780
0.1000LR
0.1000L
0.2379

25
0.2724
0.1000L
0.1000L
0.5804
0.2571R

2
0.6404
0.7757
0.1936
0.2699
0.6098
0.1000L
0.1318
0.5762

0.1477
0.7468
0.4486
0.2225
0.3483
0.5200
0.1980
0.1000L
0.4408R

14
0.1000L
0.2366
0.7544
0.2223
0.1848
0.1000L
0.4056
0.1000L

0.5878
0.3518
0.7370
0.1141
1.7040
0.3771R
0.2087
1.5550R
0.1000L
0.4990

4
0.1000L
0.1764
0.1000L
0.1975
0.6228
0.3342
0.1802R
0.1000L
0.1000L
0.1000LR

0.1000L
0.1000L
0.1000L
0.1485
0.1000LR
0.1079
1.0480 R
0.2491
0.1000L
0.1000L

23
1.8000
1.2210
0.1000L
0.3621

21
0.1740
0.1898
0.6988
0.3963

22
0.2603
0.4526R
0.1975
1.1020
0.3968
```

Sr ppm


8
50. 1000. 300. 700. 30. 30. 500. 300.R 150.
20. 30. 30. 20. 30. 70. 20. 70. 50.R
11
20. 15. 15. 20. 15. 15. 20. 30. 20. 15. 15. 20. 30. 30. 15. 30.
12
20. 50. 15. 15. 20. 30. 70. 100.
1
20. 20. 15. 50. 15. 15. 30. 15. 20. 30. 15. 20. 20. 70. 15. 30.
13
30. 70. 70. 100. 50. 50. 50. 70. 70.R 70. 50.
30
50. 30. 20. 20.
26
50. 15. 20. 30.
7
700. 1500. 1000. 100. 30. 30. 20. 2000.
200. 500. 700. 1000. 1000.R 150. 50. 100. 70.
9
15. 20. 70. 10. 15. 30. 15. 15. 20. 15. 15. 15. 20. 15. 20. 30.
20
15. 10.R 15. 15. 15.
10
700. 200. 20. 30. 30. 30. 15. 15.R 30.
20. 15.R 20. 20. 15. 15.R 30. 15. 20.R 20. 15.R 30.
29
30. 30. 30.R 30. 20.
28
20. 15. 20. 100.
5
20. 50. 15. 7.R 70. 30. 30. 30. 70.
30. 15. 10. 15. 30. 30. 50. 15. 15.
25
15. 20. 50. 30. 70.
6
20. 30. 20. 15. 30. 10. 15. 15.
50. 20. 30. 30. 20. 70. 30. 15.
24
30. 20. 15.R 50. 20.
4
50. 15. 15. 70. 10. 15. 20.R 10. 15. 20.R
20. 15. 20. 15. 15.R 15. 15.R 50. 50. 30.
3
70. 30. 300. 30. 50. 30.R 30. 50. 200. 70. 30. 30.R 50. 30. 70. 15. 50. 20.
23
70. 20. 70. 30.
32
15. 20. 15. 15.
31
7. 10. 150. 30. 20.R
2
15. 20. 30. 50. 15. 30. 20. 30.
20. 30. 100. 30. 20. 15. 15. 15. 15.R
14
30. 15. 20. 70. 50. 20. 15. 15.
15. 15. 20. 70. 50. 50.R 30. 30.R 30. 15.
22
15. 20.R 20. 20. 70.
21
100. 30. 30. 7.

Th ppm

8

0.0500	0.2000
2.1800	0.0500
0.9000	0.7000
5.7000	0.4000
3.1400	0.6000
5.7300	0.6000
3.4600	2.8200
1.7900R	0.7000
3.3500	0.0500R

11

0.6000
0.0500
0.8000
0.0500
0.0500
1.6400
0.6000
0.7000
1.3500
0.0500
0.4000
0.0500
0.0500
0.0500
0.3000
0.0500

12

0.0500
1.4600
0.1000
0.0500
0.0500
0.0500
1.6400
2.9900

1

0.8000
0.0500
0.1000
0.5000
2.2000
0.1000
1.3500
0.6000
0.6000
0.0500
0.3000
0.0500
0.1000
0.0500
0.0500
0.8000

13

0.6000
0.0500
0.0500
1.4600
4.4900
3.5400
1.1600
1.0600
2.0600R
7.4400
0.7000

30

1.0100
0.2000
0.0500
1.1700

26

2.3500
1.0400
1.0300
1.5400

7

0.7000	0.0500
1.0100	2.6900
0.2000	2.6400
1.5700	1.5000
0.0500	0.9000R
0.7000	0.0500
0.5000	8.0600
0.1000	5.8900
	4.7700

9

0.0500
0.0500
0.1000
0.7000
0.0500
0.0500
1.1200
0.2000
1.2700
0.0500
0.8000
0.0500
0.0500
0.0500
0.8000
0.1000

20

0.6000
0.5000R
0.1000
0.3000
1.5500

10

	0.5000
0.5000	0.0500R
1.3000	0.0500
0.0500	0.0500
0.0500	0.4000
1.1500	0.2000R
0.8000	0.0500
0.1000	0.7000
0.2000R	0.0500R
0.9000	0.5000
	0.1000R
	0.5000

29

2.0000
3.9800
1.0100R
0.9000
0.0500

28

0.6000
0.1000
1.1100
2.9000

6

0.5000	1.4300
0.5000	0.6000
1.1900	0.0500
0.1000	0.0500
0.4000	0.4000
0.0500	0.4000
0.5000	1.7800
0.0500	0.0500

24

0.0500
0.6000
0.0500R
0.6000
2.0200

5

0.1000	0.9000
0.0500	0.9000
0.4000	0.0500
0.0500R	0.8000R
0.9000	0.3000
0.0500	0.0500
0.0500	0.3000
1.2000	0.7000
0.3000	0.6000

25

0.2000
2.6200
0.2000
0.4000
0.0500R

3

0.6000
0.1000
→13.8600
0.7000
0.0500
0.4000R
0.0500
0.5000
0.9000
1.0400
0.9000
0.8000R
1.6600
2.9100
1.1500
0.0500
0.0500
0.0500

23

0.0500
0.0500
0.8000
0.0500

4

0.9000	0.3000
1.9900	0.0500
0.1000	0.0500
0.7000	0.0500
0.0500	1.3100R
0.0500	0.0500
0.9000R	1.0700R
1.3600	0.2000
1.6700	0.0500
0.6000R	0.0500

32

2.1800
1.4800
0.2000
0.8000

31

0.6000
0.2000
1.8100
0.0500
0.7000R

2

0.4000	0.9000
0.3000	1.2000
0.0500	0.2000
0.9000	0.0500
0.0500	0.2000
0.0500	2.4300
0.0500	0.0500
0.9000	0.0500
	0.6000R

14

	0.0500
0.8000	0.8000
0.5000	0.3000
1.7400	0.0500
1.9400	0.0500
0.4000	0.2000R
0.7000	0.7000
0.6000	1.0500R
0.2000	1.3300
	1.3400

21

0.6000
1.2700
0.0500
0.0500

22

0.2000
0.7000R
0.5000
0.0500
1.1900

p. 2C-45

U ppm

8
0.4900
0.3800
0.5300
1.2200
3.0100
1.3800
1.2300
1.4400R
1.6000
0.3800
0.4200
0.1800
0.3200
0.1500
0.2300
0.4400
0.2400
0.1900

11
0.3000
0.7400
0.2700
0.5700
0.6700
0.1000L
0.5700
0.2300
2.0500
1.6000
0.5100
0.6500
0.6400
0.9700
0.7300
0.3100

12
0.2600
0.2200
1.1200
1.0900
0.1700
2.8500
0.2500
0.5000

1
0.6300
0.7000
0.4100
0.2300
0.2600
0.3600
0.4200
0.6100
0.5000
0.4200
0.5400
0.4200
0.3900
0.3100
0.4800
0.3600

13
0.4100
0.4600
3.2400
1.2800
1.5900
0.8100
0.6800
0.6700
0.5500R
0.2000
0.8500

30
0.6800
0.3500
0.7900
0.2200

7
0.6300
0.5000
0.5400
1.0200
1.0700
1.4300
0.1900
0.6900
6.0200
1.1500
0.1000L
0.7700
0.7900R
6.4900
3.8800
2.3600
2.1100

9
0.7500
0.5300
0.1200
0.1100
0.2100
0.6200
0.2600
0.6200
0.3300
0.9700
0.3800
0.5600
0.2400
1.4300
0.4000
0.6800

20
0.6700
0.5900R
0.1800
0.2300
0.1900

10
0.3700
0.1800
0.6700
1.3500
0.4900
0.2300
0.3800
0.2700R
0.1000L
0.1700
0.2800R
0.5500
0.5900
0.4400
0.4900R
0.4900
0.3400
0.4500R
0.2900
0.4300R
0.3800

26
1.0000
0.3400
0.6500
1.0000

29
0.9300
1.1000
1.1100R
0.5100
0.6500

28
0.4900
0.8400
0.2800
0.6000

6
0.7200
0.9700
0.2300
1.1200
0.5700
1.3100
0.1000L
1.1500
1.5100
1.0500
1.5000
0.5700
0.1200
1.9500
0.6600
1.0600

24
0.8600
0.6200
0.7600R
0.2000
0.8000

5
0.9900
→3.5300
0.6100
0.6400R
1.3500
0.9800
0.5600
0.5900
1.7600
0.3000
0.2800
0.8200
0.7000R
1.0100
1.2200
1.4100
0.5800
0.3900

25
0.3400
0.6700
0.9800
0.4400
0.4500R

32
0.4800
0.5400
0.9700
0.3100

31
0.1700
0.3000
0.6700
0.3700
0.3200

3
1.0100
0.5500
2.1100
0.8400
0.1200
0.1500R
0.1300
0.2500
1.0900
0.8200
2.0600
2.0300R
1.1600
1.4000
0.5300
0.9500
0.7600
1.4200

23
0.6800
1.2900
0.6100
0.7600

4
0.5700
0.2500
0.3800
0.4500
0.6200
0.9700
0.8400R
0.8100
0.1000
0.4300R
0.1900
0.6000
0.4500
0.3300
0.1800R
0.1000L
0.1100R
0.4100
0.3400
0.2900

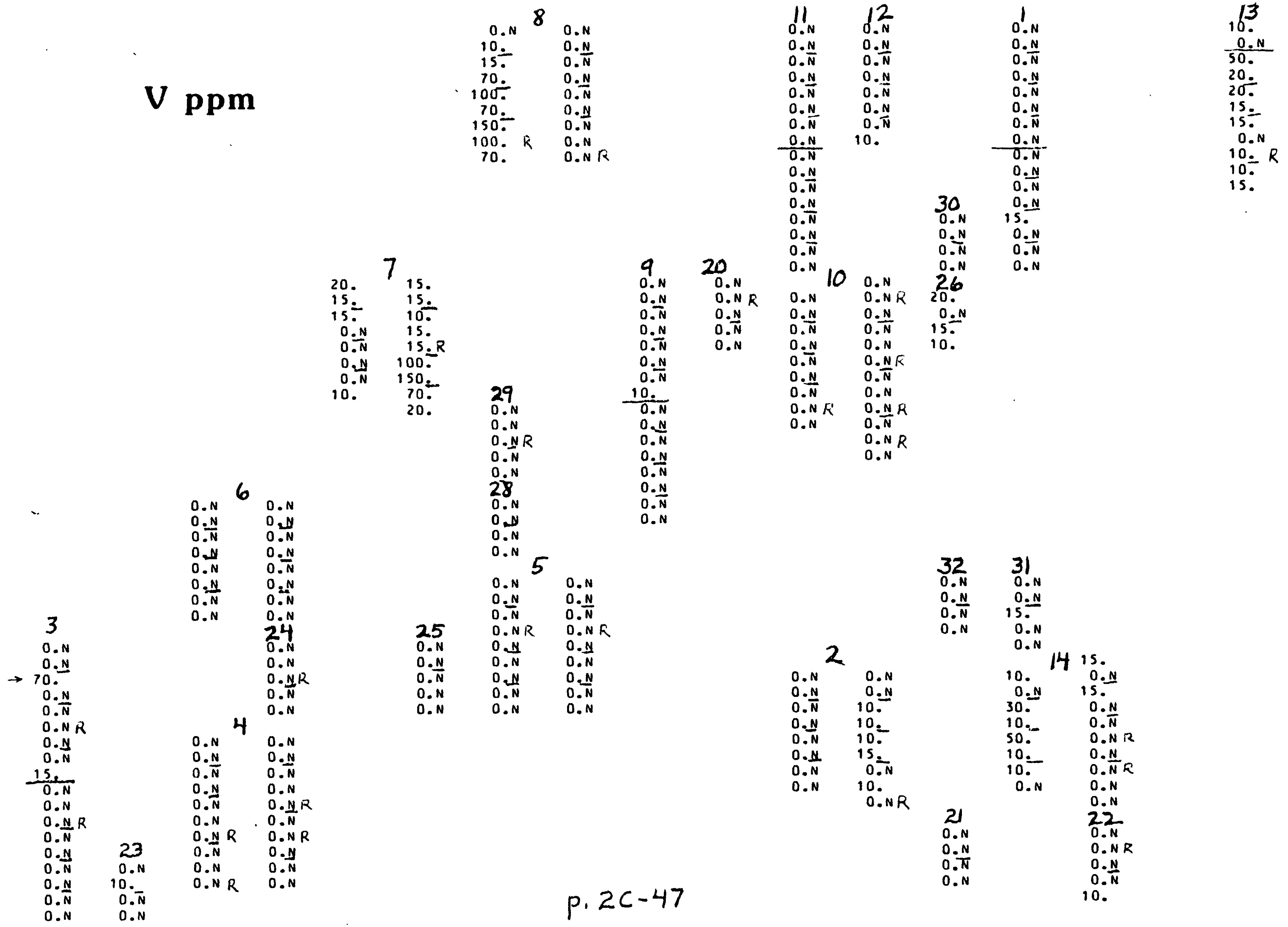
2
0.2900
0.3800
2.3600
0.4600
0.5900
0.5100
0.6600
0.7000
0.4100
0.6200
0.8900
1.1200
1.9600
1.6100
0.3500
0.5300
0.4700R

14
0.9500
0.7000
0.4900
0.2400
0.7100
0.1400
0.2700
0.1400
0.7600
0.4900
0.7200
0.2600
0.4500
0.4100R
0.2700
0.1200R
0.5600
0.1400

21
0.9300
0.5900
1.1700
0.5100

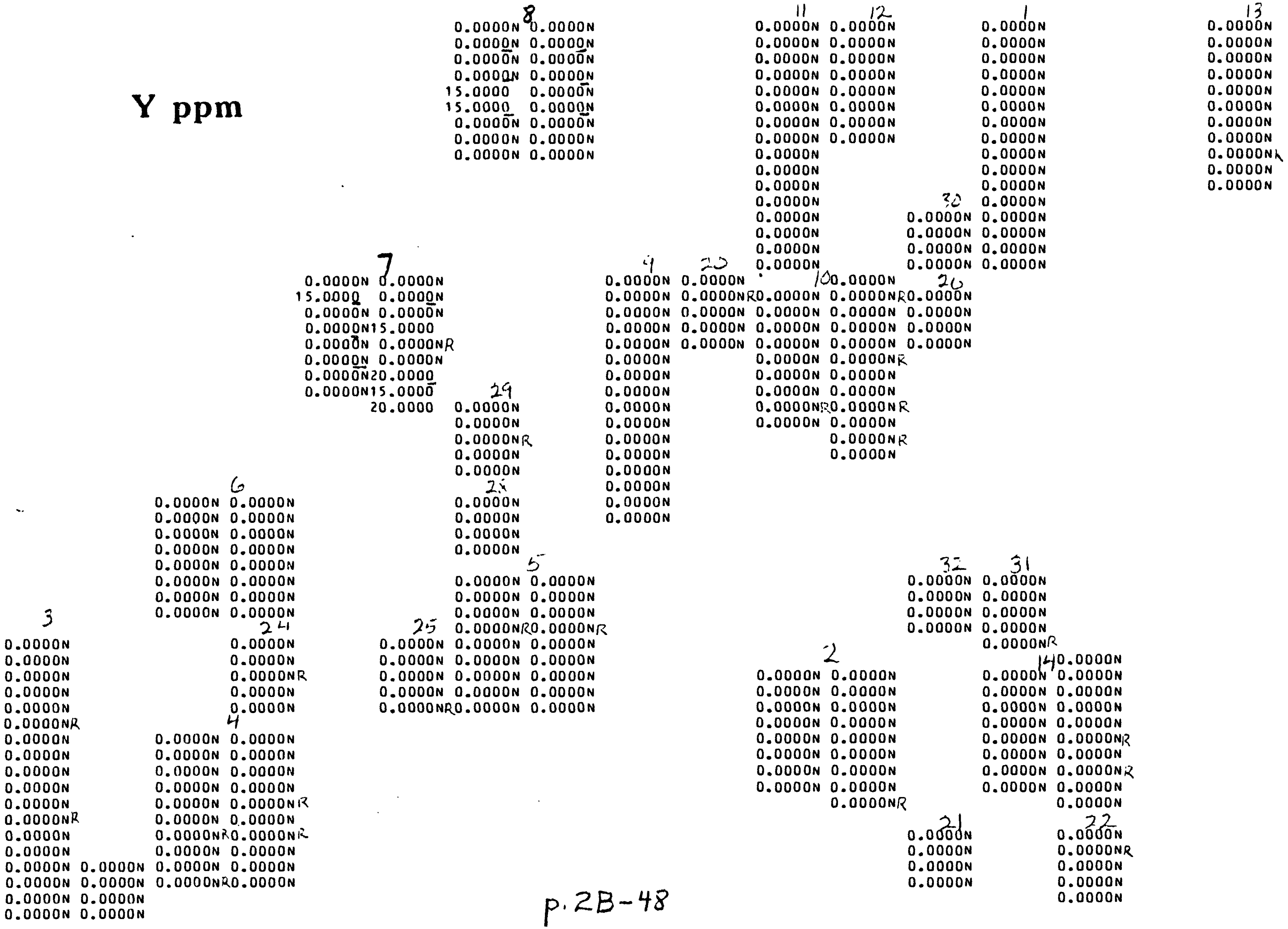
22
0.5700
0.5500R
0.5600
0.5000
0.4200

V ppm


8
0.N
10.
15.
70.
100.
70.
150.
100. R
70.
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N R
11
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
12
0.N
0.N
0.N
0.N
0.N
0.N
0.N
10.
1
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
15.
0.N
0.N
0.N
13
10.
0.N
50.
20.
20.
15.
15.
0.N
10. R
10.
15.
30
0.N
0.N
0.N
0.N
26
20.
0.N
15.
10.
7
20.
15.
15.
0.N
0.N
0.N
0.N
10.
15.
15.
10.
15.
15. R
100.
150.
70.
20.
9
0.N
0.N
0.N
0.N
0.N
0.N
0.N
10.
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
20
0.N
0.N R
0.N
0.N
0.N
10
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N R
0.N
0.N
0.N R
0.N
0.N
0.N
0.N R
0.N
0.N
0.N R
0.N
0.N R
0.N
29
0.N
0.N
0.N R
0.N
0.N
28
0.N
0.N
0.N
0.N
6
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
24
0.N
0.N
0.N R
0.N
0.N
5
0.N
0.N
0.N
0.N R
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N R
0.N
0.N
0.N
0.N
0.N
25
0.N
0.N
0.N
0.N
0.N
3
0.N
0.N
→ 70.
0.N
0.N
0.N R
0.N
0.N
15.
0.N
0.N
0.N R
0.N
0.N
0.N
0.N
0.N
0.N
23
0.N
10.
0.N
0.N
4
0.N
0.N
0.N
0.N
0.N
0.N
0.N R
0.N
0.N
0.N R
0.N
0.N
0.N
0.N
0.N R
0.N
0.N R
0.N
0.N
0.N
32
0.N
0.N
0.N
0.N
31
0.N
0.N
15.
0.N
0.N
2
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
10.
10.
10.
15.
0.N
10.
0.N R
14
10.
0.N
30.
10.
50.
10.
10.
0.N
15.
0.N
15.
0.N
0.N
0.N R
0.N
0.N R
0.N
0.N
21
0.N
0.N
0.N
0.N
22
0.N
0.N R
0.N
0.N
10.

p. 2C-47

Y ppm



8
0.0000N 0.0000N
15.0000 0.0000N
15.0000 0.0000N
7
0.0000N 0.0000N
15.0000 0.0000N
0.0000N15.0000
0.0000N 0.0000NR
0.0000N20.0000
0.0000N15.0000
20.0000
11
12
1
13
30
9
20
10
26
29
28
6
5
3
24
25
4
32
31
2
14
21
22
0.0000N
0.0000NR

p.2B-48

Yb ppm

```
                                                         8                            11      12              1                       13
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 2.0000  0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 2.0000  0.0000N                 0.0000N 0.0000N         0.0000N                →1.0000L
                                                 2.0000  0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 1.0000L 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 1.0000LR0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 1.0000L 0.0000NR                0.0000N                 0.0000N                 0.0000NR
                                                                                 0.0000N                 0.0000N                 0.0000N
                                                                                 0.0000N                 0.0000N                 0.0000N
                                                                                 0.0000N             30  0.0000N
                                                                                 0.0000N         0.0000N 0.0000N
                                                                                 0.0000N         0.0000N 0.0000N
                                                                                 0.0000N         0.0000N 0.0000N
                                         7                           9      20   0.0000N         0.0000N 0.0000N
                                 0.0000N 0.0000N                 0.0000N 0.0000N       100.0000N    26
                                →1.0000L 0.0000N                 0.0000N 0.0000NR0.0000N 0.0000NR0.0000N
                                 0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                 0.0000N 11.5000                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                 0.0000N 0.0000NR                0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                 0.0000N 0.0000N                 0.0000N         0.0000N 0.0000NR
                                 0.0000N 3.0000                  0.0000N         0.0000N 0.0000N
                                 0.0000N 2.0000      29          0.0000N         0.0000N 0.0000N
                                         2.0000  0.0000N         0.0000N         0.0000NR0.0000NR
                                                 0.0000N         0.0000N         0.0000N 0.0000N
                                                 0.0000NR        0.0000N                 0.0000NR
                                                 0.0000N         0.0000N                 0.0000N
                                                 0.0000N         0.0000N
                                                     28          0.0000N
                 0.0000N 0.0000N                 0.0000N         0.0000N
                 0.0000N 0.0000N                 0.0000N         0.0000N
                 0.0000N 0.0000N                 0.0000N
                 0.0000N 0.0000N                 0.0000N
                 0.0000N 0.0000N                         5                                            32     31
                 0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                 0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                 0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
     3                        24              25 0.0000NR0.0000NR                                0.0000N 0.0000N
 0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                         0.0000NR
 0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                         2                     140.0000N
→2.0000                  0.0000NR        0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000N                 0.0000N         0.0000NR0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000NR               4                                                        0.0000N 0.0000N         0.0000N 0.0000N
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000NR
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000NR
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000N         0.0000N 0.0000NR                                                        0.0000NR                0.0000N
 0.0000NR        0.0000N 0.0000N                                                                      21              22
 0.0000N         0.0000NR0.0000NR                                                                0.0000N         0.0000N
 0.0000N     23  0.0000N 0.0000N                                                                 0.0000N         0.0000NR
 0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
 0.0000N 0.0000N 0.0000NR0.0000N                                                                 0.0000N         0.0000N
 0.0000N 0.0000N                                                                                                 0.0000N
 0.0000N 0.0000N
```

p. 2B-49

Zn ppm

8

26.	18.
21.	29.
28.	28.
48.	10.
39.	31.
15.	10.
72.	9.
71.R	12.
49.	10.R

11

10.
19.
31.
9.
12.
11.
23.
11.
11.
11.
11.
8.
11.
13.
13.
10.

12

11.
22.
17.
24.
14.
22.
21.
16.

1

12.
20.
19.
11.
38.
19.
30.
53.
10.
9.
11.
8.
11.
10.
8.
10.

13

10.
9.
15.
25.
11.
14.
53.
45.
41.R
32.
35.

30

10.
7.
32.
11.

7

12.	14.
18.	19.
31.	16.
20.	23.
79.	31.R
31.	65.
10.	54.
27.	41.
	25.

9

11.
8.
8.
8.
10.
10.
10.
39.
9.
10.
10.
9.
11.
13.
7.
10.

20

12.
9.
10.
16.
11.

10

10.	10.
11.	15.R
10.	13.
8.	10.
14.	10.
11.	12.R
10.	12.
8.R	32.
8.	16.R
	11.
	12.R
	10.

26

9.
15.
12.
11.

29

11.
10.
12.
9.
9.

28

20.
12.
8.
16.

6

10.	18.
12.	24.
14.	15.
18.	15.
9.	8.
8.	12.
13.	30.
7.	25.

24

21.
10.
11.R
9.
8.

5

15.	25.
9.	9.
17.	7.
17.R	10.R
8.	15.
11.	11.
9.	8.
11.	17.
9.	8.

25

11.
11.
8.
9.
11.R

3

11.
40.
15.
40.
19.
21.R
→404.
13.
18.
11.
16.
15.R
8.
19.
13.
9.
10.
10.

23

16.
19.
16.
13.

4

9.	24.
24.	17.
13.	10.
14.	7.
34.	10.R
10.	13.
10.R	28.R
8.	11.
10.	11.
11.R	10.

32

76.
75.
13.
24.

31

15.
13.
19.
13.
13.R

2

42.	45.
89.	38.
184.	21.
211.	52.
1540.	106.
249.	24.
548.	11.
556.	18.
	34.R

14

	86.
12.	75.
11.	25.
17.	27.
10.	12.
15.	13.R
15.	19.
50.	16.R
53.	19.
	16.

21

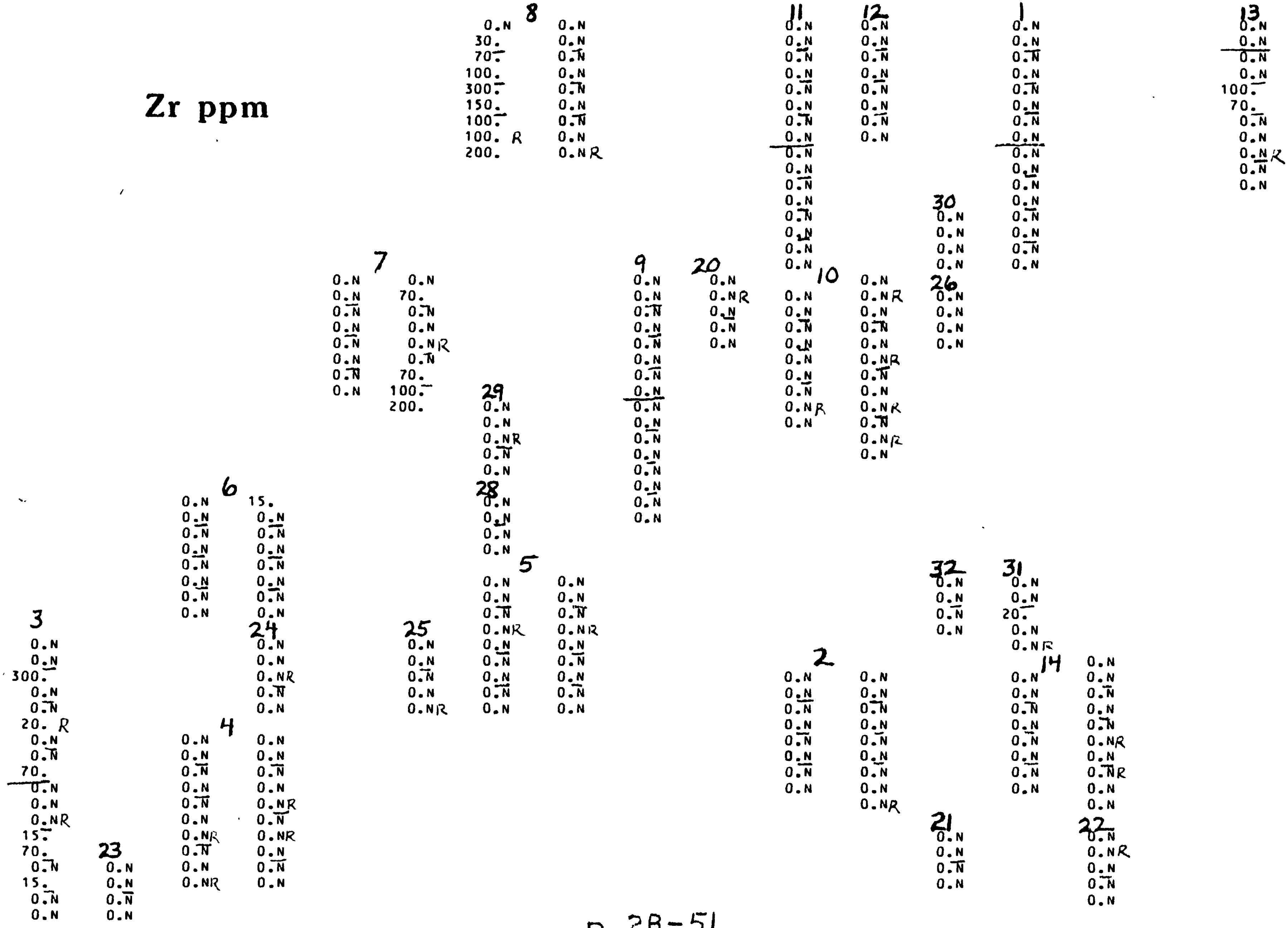
10.
9.
8.
9.

22

18.
16.R
26.
17.
40.

p. 2C-50

Zr ppm


8
0.N
30.
70.
100.
300.
150.
100.
100. R
200.
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.NR
11
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
12
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
1
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
13
0.N
0.N
0.N
0.N
100.
70.
0.N
0.N
0.NR
0.N
0.N
30
0.N
0.N
0.N
0.N
26
0.N
0.N
0.N
0.N
7
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
70.
0.N
0.N
0.NR
0.N
70.
100.
200.
9
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
20
0.N
0.NR
0.N
0.N
0.N
10
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.NR
0.N
0.N
0.NR
0.N
0.N
0.N
0.NR
0.N
0.N
0.NR
0.N
0.NR
0.N
29
0.N
0.N
0.NR
0.N
0.N
28
0.N
0.N
0.N
0.N
5
0.N
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.NR
0.N
0.N
0.N
0.N
0.N
25
0.N
0.N
0.N
0.N
0.NR
6
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
15.
0.N
0.N
0.N
0.N
0.N
0.N
0.N
24
0.N
0.N
0.NR
0.N
0.N
3
0.N
0.N
300.
0.N
0.N
20. R
0.N
0.N
70.
0.N
0.N
0.NR
15.
70.
0.N
15.
0.N
0.N
23
0.N
0.N
0.N
0.N
4
0.N
0.N
0.N
0.N
0.N
0.N
0.NR
0.N
0.NR
0.N
0.N
0.N
0.N
0.N
0.NR
0.N
0.NR
0.N
0.N
0.N
32
0.N
0.N
0.N
0.N
31
0.N
0.N
20.
0.N
0.NR
2
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.NR
14
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.N
0.NR
0.N
0.NR
0.N
0.N
21
0.N
0.N
0.N
0.N
22
0.N
0.NR
0.N
0.N
0.N

P. 2B-51

Biotite %

```
                                                                                        12
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 3.0000 <--      0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                        0.0000N 0.0000N         0.0000N         0.0000N 0.0000N
                                                0.0000N         0.0000N         0.0000N 0.0000N
                                                0.0000N         0.0000N                 0.0000N
                                                0.0000N         0.0000N                 0.0000N
                                                0.0000N         0.0000N
                                                                0.0000N
                0.0000N 0.0000N                 0.0000N         0.0000N
                0.0000N 0.0000N                 0.0000N         0.0000N
                0.0000N 0.0000N                 0.0000N
                0.0000N 0.0000N                 0.0000N
                0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
3
                                                0.0000N 0.0000N                                 0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                         0.0000N
0.2000                  0.0000N         0.0000N 0.0000N 0.0000N                                                 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
1.0000                  0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
1.5000 R                                                                        0.0000N 0.0000N         0.0000N 0.0000N
0.1000          0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.1000          0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
3.0000          0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                         0.0000N                 0.0000N
0.0000NR        0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N                                                                                                 0.0000N
0.0000N 0.0000N
```

Muscovite-Illite %

8
0.3000
5.0000
3.0000
10.0000
3.0000
7.0000
5.0000
3.0000R
5.0000

0.2000
0.1000
0.2000
0.5000
0.3000
0.2000
0.3000
0.5000
0.5000R

11
0.5000
0.3000
0.3000
0.5000
0.1000
0.3000
0.3000
2.0000
0.0500
0.0500
0.0000N
0.1000
0.0100
0.0300
0.0000N
0.3000

12
0.7000
0.5000
0.5000
0.3000
0.2000
0.5000
0.0500
1.0000

1
0.3000
0.7000
0.5000
0.3000
0.7000
0.2000
0.5000
0.3000
1.0000
0.5000
1.5000
0.0000N
0.5000
0.1000
0.7000
0.2000

13
0.1000
0.1500
0.7000
2.0000
3.0000
2.0000
1.0000
0.2000
0.5000R
1.5000
1.0000

30
0.2000
0.5000
0.3000
1.5000

7
0.3000
5.0000
0.5000
0.5000
0.5000
0.5000
1.0000
7.0000

1.0000
2.0000
2.0000
5.0000
5.0000R
0.7000
20.0000
7.0000
7.0000

9
1.0000
0.3000
0.2000
0.3000
0.7000
0.5000
0.5000
0.5000
0.1000
0.2000
0.3000
0.0200
0.0300
0.2000
0.1000
0.5000

20
0.3000
0.3000R
0.3000
0.3000
0.0700

10
0.2000
1.0000
0.3000
0.3000
0.3000
0.5000
0.5000
0.1000R
0.5000

0.3000
0.3000R
0.1000
1.0000
0.3000
0.5000R
0.3000
0.1500
0.3000R
0.5000
0.3000R
0.3000

26
3.0000
0.3000
0.3000
0.1000

29
1.5000
0.5000
0.5000R
0.3000
0.0100

28
0.1500
0.1000
0.5000
0.3000

6
0.0100
0.0500
0.0500
0.0700
0.2000
0.1500
1.0000
0.0700

1.0000
0.5000
1.0000
0.0500
0.1000
0.2000
0.5000
0.0700

24
0.3000
0.1000
0.3000R
0.3000
0.0500

5
0.2000
0.2000
0.3000
0.2000R
1.5000
0.5000
0.1000
0.1000
0.2000

0.5000
0.0500
0.1000
0.1000R
0.1500
0.3000
0.0000N
0.1000
0.0000N

25
1.0000
0.2000
0.1000
0.0500
0.0700R

3
0.3000
0.1000
→15.0000
0.1000
1.0000
0.5000R
0.0000N
0.0000N
1.0000
0.3000
0.7000
0.5000R
0.3000
1.0000
0.2000
0.1000
0.0500
0.2000

23
0.1500
0.0000N
0.3000
0.0500

4
0.5000
0.0300
0.0000N
0.1000
0.5000
0.3000
0.5000R
1.5000
0.5000
0.3000R

0.2000
0.1000
0.1000
0.1000
0.1500R
0.0700
0.1000R
0.1000
0.1500
0.0700

32
1.0000
0.5000
0.5000
0.3000

31
0.2000
0.7000
2.0000
2.0000
0.7000R

1.5000
1.0000
2.0000
1.0000
1.5000
0.5000
0.5000
0.7000

14
0.2000
0.1000
0.1500
0.0500
0.1500
0.1500R
0.5000
0.3000R
0.2000
0.0200

2
0.5000
0.7000
0.0500
0.2000
1.5000
0.1000
0.3000
0.2000

2.0000
2.0000
2.0000
5.0000
2.0000
5.0000
0.7000
1.0000
1.0000R

21
1.0000
1.0000
0.5000
0.0500

22
0.3000
0.3000R
0.3000
0.7000
2.0000

p. 2C-53

Muscovite-Illite Modifier

1-Muscovite

2-Intermediate

3-Illite

8
```
1.0000   1.0000
2.0000   1.0000
1.0000   1.0000
2.0000   1.0000
1.0000   1.0000
1.0000   1.0000
1.0000   1.0000
1.0000 R 1.0000
1.0000   1.0000 R
```

11
```
2.0000
3.0000
3.0000
3.0000
1.0000
1.0000
0.0000B
3.0000
0.0000B
0.0000B
0.0000B
2.0000
0.0000B
0.0000B
0.0000B
1.0000
```

12
```
3.0000
3.0000
3.0000
1.0000
3.0000
3.0000
0.0000B
1.0000
```

1
```
2.0000
3.0000
3.0000
1.0000
3.0000
3.0000
2.0000
3.0000
3.0000
2.0000
3.0000
0.0000B
2.0000
1.0000
3.0000
2.0000
```

13
```
3.0000
2.0000
3.0000
3.0000
3.0000
3.0000
3.0000
2.0000
3.0000 R
3.0000
3.0000
```

30
```
2.0000
3.0000
1.0000
3.0000
```

7
```
3.0000   2.0000
3.0000   3.0000
1.0000   2.0000
2.0000   2.0000
2.0000   2.0000 R
2.0000   2.0000
3.0000   3.0000
3.0000   2.0000
         3.0000
```

9
```
3.0000
3.0000
2.0000
2.0000
3.0000
3.0000
3.0000
3.0000
1.0000
1.0000
2.0000
0.0000B
1.0000
2.0000
1.0000
2.0000
```

20
```
2.0000
3.0000 R
3.0000
1.0000
1.0000
```

10
```
           2.0000
3.0000     2.0000 R
2.0000     1.0000
3.0000     3.0000
2.0000     2.0000
3.0000     3.0000 R
3.0000     1.0000
2.0000     2.0000
2.0000 R   2.0000 R
3.0000     2.0000
           2.0000 R
           1.0000
```

26
```
2.0000
2.0000
3.0000
2.0000
```

29
```
1.0000
1.0000
1.0000 R
1.0000
0.0000B
```

28
```
1.0000
1.0000
2.0000
2.0000
```

6
```
0.0000B  2.0000
1.0000   3.0000
0.0000B  2.0000
2.0000   1.0000
1.0000   1.0000
3.0000   1.0000
2.0000   3.0000
2.0000   1.0000
```

24
```
1.0000
3.0000
3.0000R
1.0000
1.0000
```

5
```
1.0000   3.0000
2.0000   1.0000
3.0000   0.0000B
2.0000 R 0.0000BR
2.0000   1.0000
1.0000   2.0000
3.0000   0.0000B
0.0000B  2.0000
1.0000   0.0000B
```

25
```
3.0000
2.0000
1.0000
0.0000B
1.0000 R
```

32
```
2.0000
3.0000
2.0000
1.0000
```

31
```
0.0000B
2.0000
2.0000
3.0000
3.0000R
```

3
```
1.0000
1.0000
1.0000
0.0000B
1.0000
1.0000 R
0.0000B
0.0000B
1.0000
1.0000
2.0000
1.0000 R
2.0000
0.0000B
1.0000
1.0000
1.0000
1.0000
```

4
```
3.0000    1.0000
0.0000B   1.0000
0.0000B   1.0000
1.0000    2.0000
3.0000    0.0000BR
2.0000    0.0000B
2.0000R   0.0000BR
3.0000    1.0000
2.0000    2.0000
1.0000 R  1.0000
```

23
```
1.0000
0.0000B
1.0000
0.0000B
```

2
```
3.0000   3.0000
3.0000   3.0000
2.0000   3.0000
2.0000   3.0000
3.0000   3.0000
2.0000   3.0000
2.0000   3.0000
3.0000   3.0000
         3.0000 R
```

14
```
         3.0000
3.0000   2.0000
3.0000   2.0000
3.0000   1.0000
1.0000   2.0000
3.0000   2.0000R
1.0000   2.0000
2.0000   2.0000R
1.0000   3.0000
         2.0000
```

21
```
3.0000
3.0000
2.0000
0.0000B
```

22
```
2.0000
3.0000
2.0000
3.0000
3.0000
```

p. 2C-54

Mixed-layer clay %

8
```
0.0000N 30.0500
1.0000  0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000NR
```

11 12
```
0.0000N 0.0000N
0.1000  0.0000N
0.0000N 0.0000N
0.0000N 0.1000
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.5000
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

1
```
0.0000N
0.0000N
0.0000N
0.0000N
0.2000
0.0500
0.2000
0.1000
0.3000
0.0000N
0.0000N
0.0000N
0.0000N
0.2000
0.0500
```

13
```
0.1000
0.1500
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.5000
```

30
```
0.1000
0.1000
0.0000N
0.0000N
```

7
```
0.0000N 0.0000N
0.0000N 1.0000
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 2.0000
        3.0000
```

9 20
```
0.0000N 30.0500
0.0000N 30.1000 R
0.0000N 0.1000
0.0000N 0.0000N
0.0000N 0.0000N
0.0500
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0100
0.0000N
0.0000N
0.0000N
```

10
```
        0.2000
0.0000N 0.2000R
0.0000N 0.0500
0.1000  0.3000
0.1000  0.1000
0.1000  0.2000R
0.2000  0.1000
0.0000N 0.0500
0.0300R 0.1000R
0.1000  0.2000
        0.1500R
        0.1000
```

26
```
0.0000N
0.1500
0.1000
0.0000N
```

29
```
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
```

28
```
0.0100
0.1000
0.0000N
0.0000N
```

6
```
0.0100  0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

5
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

25
```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
```

24
```
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
```

4
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0500  0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
```

3
```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.1000
0.1000
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.1000
0.5000
0.0100
0.0000N
```

23
```
0.0000N
0.0000N
0.0000N
0.0000N
```

32 31
```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.1000
0.0000N 0.0000N
        0.0000NR
```

2
```
0.1000  0.0000N
0.3000  0.0000N
0.0000N 0.0000N
0.1000  0.0000N
0.0000N 0.0000N
0.0200  0.0000N
0.2000  0.0000N
0.0000N 0.0000N
        0.0000NR
```

14
```
        0.2000
0.0000N 0.0500
0.0000N 0.1000
0.0000N 0.0000N
0.1000  0.0000N
0.0000N 0.0000NR
0.0000N 0.1000
0.0000N 0.1000 R
0.0000N 0.1000
        0.0000N
```

21
```
0.0000N
0.0000N
0.0000N
0.0000N
```

22
```
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
```

p. 2C-55

Mixed-layer Modifier

1-ISII ordered
2-IS ordered
3-I≷S random
4-S>I
5-S>>I
6-CI-S

I-Illite
S-Smectite
CI-Chlorite

8
```
0.0000B 3.0000
2.0000  0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000BR0.0000B
0.0000B 0.0000BR
```

11 12
```
0.0000B 0.0000B
2.0000  0.0000B
0.0000B 0.0000B
0.0000B 3.0000
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 5.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
```

1
```
0.0000B
0.0000B
0.0000B
0.0000B
4.0000
4.0000
4.0000
3.0000
3.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
3.0000
4.0000
```

30
```
4.0000
2.0000
0.0000B
0.0000B
```

13
```
3.0000
2.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
2.0000
```

7
```
0.0000B 0.0000B
0.0000B 5.0000
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 4.0000
        4.0000
```

9 20
```
0.0000B 3.0000
0.0000B 3.0000R
0.0000B 4.0000
0.0000B 0.0000B
0.0000B 0.0000B
4.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
3.0000
0.0000B
0.0000B
0.0000B
```

10
```
        5.0000
0.0000B 5.0000R
0.0000B 4.0000
4.0000  3.0000
4.0000  4.0000
4.0000  4.0000R
4.0000  4.0000
0.0000B 3.0000
2.0000R 4.0000R
2.0000  4.0000
        4.0000R
        4.0000
```

26
```
0.0000B
2.0000
2.0000
0.0000B
```

29
```
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
```

28
```
3.0000
5.0000
0.0000B
0.0000B
```

6
```
3.0000  0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
```

5
```
        0.0000B 0.0000B
        0.0000B 0.0000B
        0.0000B 0.0000B
        0.0000BR0.0000BR
```

25
```
0.0000B 0.0000B 0.0000B
0.0000B 0.0000B 0.0000B
0.0000B 0.0000B 0.0000B
0.0000B 0.0000B 0.0000B
0.0000BR0.0000B 0.0000B
```

3
```
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
4.0000
2.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
```

23
```
5.0000  0.0000B
5.0000  0.0000B
3.0000  0.0000B
0.0000B 0.0000B
```

24
```
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
```

4
```
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000BR
3.0000  0.0000B
0.0000BR0.0000BR
0.0000B 0.0000B
0.0000B 0.0000B
0.0000BR0.0000B
```

32 31
```
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 3.0000
0.0000B 0.0000B
        0.0000BR
```

2
```
4.0000  0.0000B
4.0000  0.0000B
0.0000B 0.0000B
4.0000  0.0000B
0.0000B 0.0000B
4.0000  0.0000B
3.5000  0.0000B
0.0000B 0.0000B
        0.0000BR
```

14
```
        2.0000
0.0000B 2.0000
0.0000B 2.0000
0.0000B 0.0000B
4.0000  0.0000B
0.0000B 0.0000BR
0.0000B 2.0000
0.0000B 2.0000R
0.0000B 2.0000
        0.0000B
```

21
```
0.0000B
0.0000B
0.0000B
0.0000B
```

22
```
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000B
```

p. 2C-56

Kaolinite %

8
0.0000N 0.1000
0.5000 0.0100
1.5000 0.0000N
7.0000 0.0000N
2.0000 0.0100
5.0000 0.0100
0.5000 0.0500
1.0000R 0.1000
3.0000 0.1000R

11
0.2000
0.2000
0.0000N
0.0000N
0.2000
0.2000
0.1000
0.0000N
0.3000
0.3000
0.3000
0.5000
0.5000
0.3000
0.1500
0.1000

12
0.0000N
0.0200
0.0000N
0.1000
0.2000
0.1000
0.3000
0.0000N

1
0.2000
0.3000
0.0000N
0.0300
0.0000N
0.0500
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.1000
0.0000N
0.0000N

13
0.5000
0.2000
0.0000N
0.0000N
0.0000N
0.0000N
0.7000
0.5000
0.5000 R
0.5000
1.0000

30
0.2000
0.0000N
0.0100
0.1000

7
0.2000 0.0000N
0.0000N 0.5000
0.0000N 0.0000N
0.0000N 0.1000
0.0000N 0.1000 R
0.2000 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
2.0000

9
0.0000N
0.1000
0.2000
0.1000
0.0000N
0.0500
0.0000N
0.2000
0.0000N
0.1500
0.1000
0.0500
0.0200
0.5000
0.0000N
0.1000

20
0.0500
0.1000 R
0.0000N
0.0000N
0.0000N

10
0.0500
0.0000N 0.1000 R
0.0000N 0.0100
0.0000N 0.0000N
0.0000N 0.0500
0.1000 0.0500 R
0.0000N 0.0200
0.0100 0.0000N
0.0300 R 0.0000NR
0.1000 0.0000N
0.0000NR
0.0200

26
0.0000N
0.0000N
0.5000
0.1000

29
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

28
0.0300
0.0000N
0.0000N
0.2000

6
0.0300 0.0000N
0.0200 0.0000N
0.0000N 0.0000N
0.0000N 0.0200
0.0700 0.0000N
0.0100 0.0000N
0.2000 0.3000
0.0300 0.0000N

5
0.0100 0.1000
0.0000N 0.0200
0.0000N 0.0000N
0.0000NR 0.0000NR
0.0000N 0.0100
0.0000N 0.0500
0.0100 0.0000N
0.0500 0.3000
0.0100 0.0000N

25
0.0000N
0.3000
0.0100
0.0000N
0.0000NR

32
0.0000N
0.0000N
0.0000N
0.0000N

31
0.0000N
0.0000N
1.0000
0.0000N
0.0000NR

14
0.3000
0.7000 0.3000
0.0000N 0.5000
0.2000 0.2000
0.1000 0.0500
0.0000N 0.0500 R
0.1000 0.2000
0.0000N 0.2000 R
0.0000N 0.3000
0.0300

3
0.0000N
0.0000N
0.1000
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0200
0.0000N
0.0000NR
0.0000N
0.0000N
0.1000
0.0000N
0.1500
0.0000N

24
0.0000N
0.0200
0.0000NR
0.2000
0.1000

4
0.0000N 0.0000N
0.0000N 0.0200
0.0000N 0.0100
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000NR 0.0000NR
0.3000 0.0000N
0.0000N 0.0000N
0.0000NR 0.0100

23
0.0100
0.0000N
0.0000N
0.0200

2
0.0000N 0.0000N
0.0000N 0.0000N
0.1500 0.0000N
0.1000 0.0000N
0.3000 0.0000N
0.0300 0.0000N
0.2000 0.0000N
0.3000 0.0000N
0.0000NR

21
0.0000N
0.0000N
0.0000N
0.0100

22
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N

p. 2C-57

Kaolinite
Modifier

1-Well crystallized

2-Intermediate

3-Poorly crystallized

8
```
0.0000B 1.0000
2.0000  1.0000
1.0000  0.0000B
1.0000  0.0000B
1.0000  0.0000B
1.0000  0.0000B
1.0000  2.0000
1.0000 R1.0000
1.0000  1.0000 R
```

11 12
```
1.0000  0.0000B
1.0000  0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
1.0000  2.0000
1.0000  0.0000B
0.0000B 1.0000
0.0000B 0.0000B
1.0000
2.0000
1.0000
1.0000
1.0000
1.0000
1.0000
1.0000
```

1
```
2.0000
2.0000
0.0000B
1.0000
0.0000B
1.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
1.0000
0.0000B
0.0000B
```

13
```
1.0000
1.0000
0.0000B
0.0000B
0.0000B
0.0000B
1.0000
1.0000
1.0000 R
1.0000
1.0000
```

30
```
1.0000
0.0000B
0.0000B
→3.0000
```

7
```
0.0000B 0.0000B
0.0000B 2.0000
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000BR
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
        2.0000
```

9 20
```
0.0000B 0.0000B
0.0000B 0.0000BR
1.0000  0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B
0.0000B
1.0000
0.0000B
1.0000
1.0000
1.0000
1.0000
1.0000
0.0000B
1.0000
```

10
```
        2.0000
0.0000B 1.0000 R
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
2.0000  0.0000BR
0.0000B 0.0000B
0.0000B 0.0000B
2.0000 R0.0000BR
0.0000B 0.0000B
        0.0000BR
        0.0000B
```

26
```
0.0000B
0.0000B
1.0000
1.0000
```

29
```
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
```

28
```
1.0000
0.0000B
0.0000B
2.0000
```

6
```
1.0000  0.0000B
1.0000  0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
1.0000  0.0000B
0.0000B 0.0000B
2.0000  1.0000
1.0000  0.0000B
```

24
```
0.0000B
1.0000
0.0000BR
1.0000
1.0000
```

5
```
0.0000B 1.0000
0.0000B 1.0000
0.0000B 0.0000B
0.0000BR0.0000BR
0.0000B 0.0000B
0.0000B 2.0000
0.0000B 0.0000B
0.0000B 1.0000
0.0000B 0.0000B
```

25
```
0.0000B
1.0000
0.0000B
0.0000B
0.0000BR
```

3
```
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
1.0000
0.0000B
1.0000
0.0000B
```

23
```
0.0000B
0.0000B
0.0000B
0.0000B
```

4
```
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000BR
0.0000B 0.0000B
0.0000BR0.0000BR
2.0000  0.0000B
0.0000B 0.0000B
0.0000BR2.0000
```

32 31
```
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 2.0000
0.0000B 0.0000B
        0.0000BR
```

2
```
0.0000B 0.0000B
0.0000B 0.0000B
1.0000  0.0000B
1.0000  0.0000B
1.0000  0.0000B
0.0000B 0.0000B
1.0000  0.0000B
1.0000  0.0000B
        0.0000BR
```

14
```
        1.0000
2.0000  1.0000
0.0000B 1.0000
0.0000B 1.0000
1.0000  2.0000
0.0000B 2.0000 R
0.0000B 1.0000
0.0000B 1.0000 R
0.0000B 1.0000
        1.0000
```

21
```
0.0000B
0.0000B
0.0000B
0.0000B
```

22
```
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000B
```

p, 2C-58

Chlorite %

```
        8
0.0000N  0.0000N
0.5000   0.0000N
0.0000N  0.0000N
2.0000   0.1000
0.0000N  0.0100
0.0000N  0.0000N
0.0000N  0.0000N
0.0000NR 0.0200
0.0000N  0.0100 R
```

```
                  11       12                1
                  0.0500   0.0000N           0.0000N
                  0.0000N  0.0000N           0.0000N
                  0.0000N  0.0000N           0.0000N
                  0.0000N  0.0000N           0.0000N
                  0.0000N  0.0500            0.0000N
                  0.0000N  0.0000N           0.0000N
                  0.0000N  0.1000            0.0000N
                  0.0000N  0.5000            0.0000N
                  0.0000N                    0.0000N
                  0.0000N                    0.0000N
                  0.0000N                    0.0000N
                  0.0000N           30       0.0000N
                  0.0000N           0.0000N  0.0000N
                  0.0000N           0.1000   0.0000N
                  0.0000N           0.0000N  0.0000N
9        20       0.0000N           0.0000N  0.0000N
0.0000N  0.0000N  10       0.0000N  26
0.0000N  0.0000NR 0.0000N  0.0000NR 0.0000N
0.0000N  0.0500   0.0000N  0.0000N  0.0000N
0.0000N  0.0000N  0.0000N  0.0000N  0.0000N
0.0000N  0.0000N  0.0500   0.0000N  0.0000N
0.0000N           0.0000N  0.0000NR
0.0000N           0.0500   0.0000N
0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000NR
0.0000N           0.0000N  0.0500
0.0000N                    0.0500 R
0.0000N                    0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

```
  13
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
```

```
         7
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  0.0000NR
0.0000N  0.0000N
0.0000N  0.0000N
0.0000N  3.0000   29
         3.0000   0.0000N
                  0.0000N
                  0.0000NR
                  0.0000N
                  0.0000N
                  28
                  0.0000N
                  0.0000N
                  0.0000N
                  0.0000N
                       5
                  0.0000N  0.0000N
                  0.0000N  0.0000N
                  0.0000N  0.0000N
         25       0.0000NR 0.0000NR
         0.0000N  0.0000N  0.0000N
         0.0000N  0.0000N  0.0000N
         0.0000N  0.0000N  0.0000N
         0.0000N  0.0000N  0.0000N
         0.0000NR 0.0000N  0.0000N
```

```
                      6
                  0.0000N  0.0000N
                  0.0000N  0.0000N
                  0.0000N  0.0000N
                  0.0100   0.0000N
                  0.0000N  0.0000N
                  0.0000N  0.0000N
                  0.0000N  0.1000
                  0.0000N  0.0000N
3                          24
0.0100                     0.0000N
0.5000                     0.0000N
0.0000N                    0.0000NR
1.0000                     0.0000N
7.0000                     0.0000N
3.0000 R               4
0.7000            0.0000N  0.0000N
0.2000            0.0000N  0.0000N
0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000NR
0.0000NR          0.0000N  0.0000N
0.0000N           0.0000NR 0.0000NR
0.0000N  23       0.0000N  0.0000N
0.0000N  0.0000N  0.0000N  0.0000N
0.1000   0.0000N  0.0000NR 0.0000N
0.0000N  0.0000N
0.0000N  0.0000N
```

```
                  32       31
                  0.0000N  0.0000N
                  0.0500   0.1000
                  0.0000N  0.0000N
                  0.0000N  0.0000N
                           0.0000NR
     2                           14 0.0000N
0.0000N  0.0000N           0.0000N  0.0000N
0.0000N  0.0000N           0.0000N  0.0000N
0.0000N  0.0000N           0.0000N  0.0500
0.0000N  0.0000N           0.0000N  0.0000N
0.0000N  0.0000N           0.0000N  0.0000NR
0.0000N  0.0000N           0.0000N  0.0000N
0.0000N  0.0000N           0.1000   0.0000NR
0.0000N  0.0000N           0.1000   0.0000N
         0.0000NR                   0.0000N
                  21                22
                  0.0000N           0.0000N
                  0.0000N           0.0000N
                  0.0000N           0.0000N
                  0.0000N           0.0000N
                                    0.0000N
```

p.2C-59

Corrensite %

```
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                        0.0000N 0.0000N         0.0000N         0.0000N 0.0000N
                                                0.0000N         0.0000N         0.0000N 0.0000N
                                                0.0000N         0.0000N                 0.0000N
                                                0.0000N         0.0000N                 0.0000N
                                                0.0000N         0.0000N
                                                                0.0000N
                0.0000N 0.0000N                 0.0000N         0.0000N
                0.0000N 0.0000N                 0.0000N         0.0000N
                0.0000N 0.0000N                 0.0000N
                0.0000N 0.0000N                 0.0000N
                0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                                                0.0000N 0.0000N                                 0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                         0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                         2                       0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.5000          0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 1.0000          0.0000N 0.0000N
0.0000N                                                                         0.0000N 1.0000          0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                         0.0000NR                0.0000N
0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N                                                                                                 0.0000N
0.0000N 0.0000N
```

p.2C-60

Talc %

```
                                                      0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                    0.0000N  0.1000            0.0000N                    0.0000N
                                                      0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N                    0.0000N
                                                      0.0000N  0.0000N                    0.0000N                    0.0000N                    0.0000N
                                                                                          0.0000N                    0.0000N                    0.0000N
                                                                                          0.0000N                    0.0000N                    0.0000N
                                                                                          0.0000N                    0.0000N
                                                                                          0.0000N           0.0000N  0.0000N
                                                                                          0.0000N           0.0000N  0.0000N
                                                                                          0.0000N           0.0000N  0.0000N
                                                                                          0.0000N           0.0000N  0.0000N
                                    0.0000N  0.0000N                    0.0000N  0.0000N       10 0.0000N    26
                                    0.0000N  0.0000N                    0.0000N  0.0000N  0.0000N  0.0000NR 0.0000N
                                    0.0000N  0.0000N                    0.0000N  0.0000N  0.0000N  0.0000N →0.0500
                                    0.0000N  0.0000N                    0.0000N  0.0000N  0.0000N  0.0000N  0.0000N
                                    0.0000N  0.0000N                    0.0000N  0.0000N →0.0500   0.0000N  0.0000N
                                    0.0000N  0.0000N                    0.0000N           0.0000N  0.0000NR
                                    0.0000N  0.0000N                    0.0000N           0.0000N  0.0000N
                                    0.0000N  0.0000N                    0.0000N           0.0000N  0.0000N
                                             0.0000N  0.0000N           0.0000N           0.0000NR 0.0000NR
                                                      0.0000N           0.0000N           0.0000N  0.0000N
                                                      0.0000N           0.0000N                    0.0000NR
                                                      0.0000N           0.0000N                    0.0000N
                                                      0.0000N           0.0000N
                           6                           28               0.0000N
                  0.0000N  0.0000N                    0.0000N           0.0000N
                  0.0000N  0.0000N                   →0.0100            0.0000N
                  0.0000N  0.0000N                    0.0000N
                  0.0000N  0.0000N                    0.0000N
                  0.0000N  0.0000N
                  0.0000N →0.0200                     0.0000N  0.0000N                                      0.0000N  0.0000N
                  0.0000N  0.0000N                    0.0000N  0.0000N                                      0.0000N  0.0000N
                  0.0000N  0.0000N                    0.0000N  0.0000N                                      0.0000N  0.0000N
     3                                                0.0000N  0.0000N                                      0.0000N  0.0000N
0.2000                     0.0000N           0.0000N  0.0000N  0.0000N                                               0.0000N
0.5000                     0.0000N           0.0000N  0.0000N  0.0000N                                                        0.0000N
0.0000N                    0.0000N           0.0000N  0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N  0.0000N
1.0000                     0.0000N           0.0000N  0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N  0.0000N
0.0000N                    0.0000N           0.0000N  0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N  0.0000N
0.0000NR                                                                                  0.0000N  0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N                                                        0.0000N  0.0000N           0.0000N  0.0000N
0.7000            0.0000N  0.0000N                                                        0.0000N  0.0000N           0.0000N  0.0000N
3.0000            0.0000N  0.0000N                                                        0.0000N  0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N                                                        0.0000N  0.0000N           0.0000N  0.0000N
0.0000N           0.0000N  0.0000N                                                                 0.0000N                    0.0000N
0.0000NR          0.0000N  0.0000N
0.0000N           0.0000N  0.0000N                                                                          0.0000N           0.0000N
0.0000N           0.0000N  0.0000N                                                                          0.0000N           0.0000N
0.0000N  0.0000N  0.0000N  0.0000N                                                                          0.0000N           0.0000N
0.5000   0.0000N  0.0000N  0.0000N                                                                          0.0000N           0.0000N
0.0000N  0.0000N                                                                                                              0.0000N
0.0000N  0.0000N
```

p.2C-61

Total clay %

8

0.3000	0.3500
7.0000	0.1100
4.5000	0.2000
19.0000	0.6000
5.0000	0.3200
12.0000	0.2100
5.5000	0.3500
4.0000R	0.6200
8.0000	0.6100R

11

0.7500
0.6000
0.3000
0.5000
0.3000
0.5000
0.4000
2.0000
0.3500
0.3500
0.3000
0.6000
0.5100
0.3300
0.1500
0.4000

12

0.7000
0.5200
0.5000
0.5000
0.4500
0.6000
0.5500
5.0000

1

0.5000
1.0000
0.5000
0.3300
0.9000
0.3000
0.7000
0.4000
1.3000
0.5000
1.5000
0.01 L
0.5000
0.2000
0.9000
0.2500

13

0.7000
0.5000
0.7000
2.0000
3.0000
2.0000
1.7000
0.7000
1.0000P
2.0000
2.5000

30

0.5000
0.7000
0.3100
1.6000

7

0.5000	1.0000
5.0000	3.5000
0.5000	2.0000
0.5000	5.1000
0.5000	5.1000R
0.7000	0.7000
1.0000	20.0000
7.0000	12.0000
	15.0000

9

1.0000
0.4000
0.4000
0.4000
0.7000
0.6000
0.5000
0.7000
0.1000
0.3500
0.4000
0.0700
0.0600
0.7000
0.1000
0.6000

20

0.4000
0.5000R
0.4500
0.3000
0.0700

10

	0.5500
0.2000	0.6000R
1.0000	0.1600
0.4000	1.3000
0.5000	0.4500
0.5000	0.7500R
0.7500	0.4200
0.5100	0.2000
0.1600R	0.4000R
0.7000	0.7500
	0.5000R
	0.4200

26

3.0000
0.5000
0.9000
0.2000

29

1.5000
0.5000
0.5000R
0.3000
0.0100

28

0.1900
0.2100
0.5000
0.5000

6

0.0500	1.0000
0.0700	0.5000
0.0500	1.0000
0.0800	0.0700
0.2700	0.1000
0.1600	0.2200
1.2000	0.9000
0.1000	0.0700

5

0.2100	0.6000
0.2000	0.0700
0.3000	0.1000
0.2000R	0.1000R
1.5000	0.1600
0.5000	0.3500
0.1100	0.01 L
0.1500	0.4000
0.2100	0.01 L

32

1.0000
0.5500
0.5000
0.3000

31

0.2000
0.8000
3.1000
2.0000
0.7000R

3

0.5100
1.3000
15.1000
2.1000
9.0000
5.0000R
0.8000
1.1000
7.1000
0.3200
0.7000
0.5000R
0.3000
1.0000
0.4000
1.2000
0.2100
0.2000

24

0.3000
0.1200
0.3000R
0.5000
0.1500

25

1.0000
0.5000
0.1100
0.0500
0.0700R

2

0.6000	2.5000
1.0000	2.0000
0.2000	3.0000
0.4000	6.0000
1.8000	2.0000
0.1500	5.0000
0.7000	0.7000
0.5000	1.0000
	1.0000R

14

	0.7000
2.2000	0.4500
1.0000	0.7500
2.2000	0.3000
1.2000	0.2000
1.5000	0.2000R
0.6000	0.8000
0.6000	0.6000R
0.8000	0.6000
	0.0500

4

0.5000	0.2000
0.0300	0.1200
0.01 L	0.1100
0.1000	0.1000
0.5000	0.1500R
0.3500	0.0700
0.5000R	0.1000R
1.8000	0.1000
0.5000	0.1500
0.3000R	0.0800

23

0.1600
0.01 L
0.3000
0.0700

21

1.0000
1.0000
0.5000
0.0600

22

0.3000
0.3000R
0.3000
0.7000
2.0000

Quartz %

8
1.0000 0.0100
10.0000 0.2000
19.0000 0.0100
24.0000 0.0200
47.0000 0.1000
45.0000 0.0100
20.0000 0.0500
20.0000R 0.0200
27.0000 0.0200R

11
0.0000N
0.0000N
0.1000
0.5000
0.3000
0.0100
0.2000
0.1000
0.2000
1.5000
0.3000
0.5000
0.5000
0.3000
0.3000
0.1000

12
0.0200
0.0200
0.0200
0.0300
0.3000
3.0000
0.2000
0.5000

1
0.5000
0.5000
1.0000
0.1000
1.0000
0.0500
0.3000
0.3000
1.5000
0.3000
1.0000
10.0000
0.3000
0.5000
1.5000
0.3000

13
0.3000
0.3000
11.0000
4.0000
24.0000
10.0000
4.0000
2.0000
1.5000R
3.0000
4.0000

30
0.5000
0.0500
0.2000
4.0000

26
3.0000
0.0200
1.5000
0.0500

7
2.0000 1.0000
10.0000 7.0000
9.0000 32.0000
1.5000 5.0000
13.0000 5.0000R
12.0000 11.0000
21.0000 30.0000
7.0000 27.0000
27.0000

9
0.3000
0.7000
0.0500
0.0100
5.0000
0.0200
0.3000
0.2000
0.2000
0.0500
0.5000
0.3000
0.0200
0.7000
0.0500
0.5000

20
0.0100
0.0100R
0.0500
0.0500
0.0200

10
0.0100
2.0000 0.0100R
0.4000 0.0300
0.3000 3.0000
0.5000 0.0200
0.5000 0.0000NR
0.0200 0.0500
0.0500 0.0200
0.0300R 0.1000R
0.0500 0.0100
0.0500R
0.0100

29
1.5000
0.0200
0.2000R
0.3000
0.3000

28
0.5000
0.1000
2.0000
0.0500

6
0.0500 7.0000
0.0200 1.0000
0.0200 3.0000
0.1000 0.0200
0.5000 0.0200
3.0000 0.0500
3.0000 0.1000
0.0300 0.0500

24
0.1000
0.1000
0.1000R
1.0000
0.0500

5
0.0500 0.3000
0.3000 0.7000
0.1000 0.7000
0.2000R 0.7000R
2.0000 0.1000
0.1000 0.1000
0.0500 4.0000
0.0300 0.1000
0.1000 11.0000

25
2.0000
0.1000
0.0100
0.2000
0.0500R

3
0.2000
1.0000
15.0000
3.0000
0.0100
0.0000NR
0.0100
0.0100
0.0000N
0.0100
2.0000
2.0000R
8.0000
12.0000
0.0500
0.0100
0.0500
0.0200

23
0.1000
0.0000N
0.2000
0.0200

4
0.3000 0.0500
0.0100 0.0300
17.0000 0.0500
0.5000 3.0000
0.5000 2.0000R
0.0500 0.0500
0.1000R 0.0100R
0.8000 0.0500
0.2000 0.7000
0.1500R 0.0500

32
0.1000
0.1000
0.3000
0.0300

31
0.0000N
0.0500
5.0000
10.0000
9.0000R

2
0.3000 12.0000
0.7000 1.0000
0.0200 15.0000
0.0100 3.0000
6.0000 4.0000
0.0500 12.0000
0.3000 5.0000
3.0000 2.0000
2.0000R

14
0.1000
(6.0000 0.0100
7.0000 0.0000N
0.3000 0.3000
0.2000 0.0500
0.0500 0.0500R
0.3000 0.0500
0.5000 0.0500R
0.0200 0.2000
0.0500

21
1.5000
0.1000
0.2000
0.1000

22
1.0000
1.5000R
0.3000
0.7000
8.0000

p. 2C-63

K-feldspar %

8

0.0000N	0.0500
0.5000	0.1000
2.0000	0.0000N
2.0000	0.0100
5.0000	0.0000N
1.0000	0.0000N
1.0000	0.0100
2.0000 R	0.0000N
5.0000	0.0000NR

11

0.0000N
0.0000N
0.0500
0.1000
0.1000
0.0100
0.1000
0.0000N
0.0500
0.0500
0.0000N
0.0100
0.1000
0.0500
0.1000
0.1000

12

0.0000N
0.0000N
0.0000N
0.0100
0.2000
0.0100
0.0000N
0.0000N

1

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0200
0.0100.
0.1000
0.0500
0.2000
0.0000N
0.0000N
0.0500
0.1000
0.0100

13

0.0200
0.0000N
0.0000N
0.0000N
5.0000
3.0000
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

30

0.0200
0.0100
0.0200
0.0000N

7

0.0000N	0.0200
0.0000N	2.0000
0.0000N	0.0000N
0.0000N	0.0000N
0.0000N	0.0000NR
0.0100	0.1000
0.0000N	3.0000
0.0300	7.0000
	27.0000

9

0.5000
0.3000
0.0300
0.3000
0.0000N
0.0500
0.0000N
0.2000
0.0500
0.0300
0.0500
0.0000N
0.0200
0.1000
0.0100
0.1000

20

0.0200
0.0500R
0.0000N
0.0000B
0.0200

10

	0.0100
1.0000	0.0100R
0.2000	0.0200
0.0100	0.2000
0.0500	0.0200
0.0000N	0.0000NR
0.0000N	0.0000N
0.0200	0.0200
0.0300K	0.0500 R
0.0500	0.0000N
	0.0100 R
	0.0200

26

1.0000
0.0500
0.2000
0.0100

29

0.1000
0.0200
0.1000R
0.0000N
0.1000

28

0.0300
0.0300
0.0000N
0.0200

6

0.0100	0.0000N
0.0000N	0.0000N
0.0000N	0.0100
0.0100	0.0500
0.0500	0.0000N
0.0000N	0.0000N
0.0000N	0.2000
0.0300	0.0100

5

0.0000N	0.0100
0.0000N	0.0200
0.0000N	0.0000N
0.0000NR	0.0000NR
0.0000N	0.0200
0.0100	0.0100
0.0100	0.0000N
0.0000N	0.0000N
0.0000N	0.0000N

32

0.1000
0.0500
0.1000
0.0000N

31

0.0000N
0.0000N
0.1000
0.0000N
0.0000NR

3

0.0100
0.0000N
5.0000
0.1000
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0500
0.1000
0.0300R
0.0300
5.0000
0.0100
0.0000N
0.0100
0.0000N

24

0.0100
0.0000N
0.0000NR
0.0000N
0.0500

25

0.2000
0.0100
0.0100
0.0100
0.0000NR

2

0.0000N	0.0000N
0.0500	0.0000N
0.0200	0.0000N
0.0000N	0.0000N
0.0000N	0.0000N
0.0100	0.0000N
0.0000N	0.0000N
0.0000N	0.0000N
	0.0000NR

14

	0.0000N
0.5000	0.0000N
1.0000	0.0000N
0.0300	0.0500
0.0000N	0.0200
0.0100	0.0100 R
0.0300	0.0000N
0.0500	0.0000NR
0.0000N	0.0200
	0.0100

4

0.0000N	0.0000N
0.0000N	0.0000N
0.0000N	0.0000N
0.0000N	0.0000N
0.0000N	0.0000NR
0.0100	0.0000N
0.0100R	0.0000NR
0.0100	0.0000N
0.0500	0.0000N
0.1000R	0.0000N

23

0.0100
0.0000N
0.0000N
0.0000N

21

0.0000N
0.0000N
0.0100
0.0500

22

0.0100
0.0000NR
0.0000N
0.0000N
0.0000N

K-feldspar Modifier

1-Monoclinic

2-Both

3-Triclinic

8
```
0.0000B 0.0000B
0.0000B 0.0000B
2.0000  0.0000B
0.0000B 0.0000B
3.0000  0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000BR0.0000B
3.0000  0.0000BR
```

11
```
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
1.0000
0.0000B
```

12
```
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
```

1
```
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
1.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
```

13
```
0.0000B
0.0000B
0.0000B
0.0000B
2.0000
2.0000
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
```

30
```
0.0000B
0.0000B
0.0000B
0.0000B
```

7
```
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000BR
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
        2.0000
```

9
```
0.0000B
0.0000B
0.0000B
3.0000
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
```

20
```
0.0000B
0.0000BR
0.0000B
0.0000B
```

10
```
        0.0000B
1.0000  0.0000B
2.0000  0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000BR
0.0000B 0.0000B
0.0000B 0.0000B
0.0000BR0.0000BR
0.0000B 0.0000B
        0.0000BR
        0.0000B
```

26
```
1.0000
0.0000B
0.0000B
0.0000B
```

29
```
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
```

28
```
0.0000B
0.0000B
0.0000B
0.0000B
```

6
```
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
```

5
```
0.0000B  0.0000B
0.0000B  0.0000B
0.0000B  0.0000B
0.0000BR 0.0000BR
         0.0000B
         0.0000B
         0.0000B
         0.0000B
         0.0000B
```

25
```
0.0000B  0.0000B
0.0000B  0.0000B
0.0000B  0.0000B
0.0000B  0.0000B
0.0000BR 0.0000B
```

3
```
0.0000B
0.0000B
1.0000
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
```

23
```
0.0000B
0.0000B
0.0000B
0.0000B
```

24
```
0.0000B
0.0000B
0.0000BR
0.0000B
0.0000B
```

4
```
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000BR
0.0000B 0.0000B
0.0000BR0.0000BR
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
```

32
```
0.0000B
0.0000B
0.0000B
0.0000B
```

31
```
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
```

2
```
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
        0.0000BR
```

14
```
        0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000B
0.0000B 0.0000BR
0.0000B 0.0000B
0.0000B 0.0000BR
0.0000B 0.0000B
        0.0000B
```

21
```
0.0000B
0.0000B
0.0000B
0.0000B
```

22
```
0.0000B
0.0000BR
0.0000B
0.0000B
0.0000B
```

p.2C-65

Plagioclase %

8

```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000NR
```

11 12

```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N→0.0100
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

30 1

```
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
        0.0000N
0.0000N 0.0000N
0.0000N→0.0500
0.0000N 0.0000N
0.0000N 0.0000N
```

13

```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
```

7

```
0.0000N 0.0100
0.0000N 2.0000
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
→0.0100 0.0000N
0.0000N 5.0000
0.0000N 5.0000
        3.0000
```

9 20

```
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
```

10 26

```
        0.0000N
0.0000N 0.0000NR0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
→0.0200 →0.0200
0.0000NR0.0000N
0.0000N 0.0000N
        0.0000N
        0.0000N
```

29

```
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
```

25

```
0.0000N
0.0000N
0.0000N
0.0000N
```

6

```
0.0200  0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

5 / 25

```
        0.0000N 0.0000N
        0.0000N 0.0000N
        0.0000N 0.0000N
        0.0000NR0.0000NR
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000N 0.0000N 0.0000N
0.0000NR0.0000N 0.0000N
```

24

```
0.0000N
0.0000N
0.0000NR
0.0000N
→0.0100
```

4

```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
→0.0100 R0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

3 / 23

```
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
→0.0100 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
```

32 31

```
0.0000N 0.0000N
0.0000N→0.0100
0.0000N 0.0000N
0.0000N 0.0000N
        0.0000NR
```

2

```
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
→0.0100 0.0000N
0.0000N 0.0000N
0.0000N→0.0200
        0.0000NR
```

14

```
        0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
→0.0100 0.0000NR
0.0000N 0.0000N
        0.0000N
```

21

```
0.0000N
0.0000N
→0.0200
0.0000N
```

22

```
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
```

p. 2C-66

Calcite %

8
0.7000 0.5000
74.0000 0.0000N
73.0000 0.0000N
40.0000 0.5000
12.0000 0.0000N
0.0000N 0.3000
54.0000 0.0000N
55.0000 R 0.2000
26.0000 0.2000 R

11 12
0.5000 0.0000N
3.0000 0.3000
0.0000N 0.7000
0.0000N 0.5000
0.0000N 0.3000
0.1000 181.0000
0.3000 6.0000
0.2000 34.0000
0.3000
0.5000
1.0000
0.5000
0.0000N
0.0000N
0.0000N
0.0000N

1
0.0000N
0.0000N
0.0000N
5.0000
0.0000N
0.0000N
25.0000
0.3000
0.0000N
0.0000N
0.0000N
0.2000
5.0000
0.3000
0.1000
6.0000

13
1.5000
5.0000
0.0000N
8.0000
10.0000
5.0000
5.0000
7.0000
10.0000R
4.0000
0.3000

30
0.0000N
6.0000
2.0000
21.0000

7
96.0000 74.0000
84.0000 73.0000
89.0000 66.0000
0.0000N89.0000
0.0000N89.0000 R
0.0000N86.0000
0.0000N10.0000
83.0000 18.0000
13.0000

9 20
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.2000
0.2000
1.0000
1.5000
0.3000
0.3000
0.0000N
0.0000N
0.0000N
0.0000N
0.3000
0.0000N

10
4.0000
95.0000 5.0000 R
94.0000 3.0000
0.2000 0.2000
1.5000 0.2000
0.5000 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR 0.0000NR
0.3000 2.0000
3.0000 R
1.5000

26
0.0000N
0.0000N
8.0000
3.0000

29
0.1000
0.0000N
0.0000NR
0.2000
0.3000

28
0.2000
0.2000
0.0000N
6.0000

6
0.0000N 0.0000N
0.0000N 0.0000N
0.1000 0.0000N
0.2000 0.2000
0.5000 0.0000N
0.0000N 0.0000N
0.5000 1.0000
3.0000 3.0000

5
6.0000 0.2000
0.0000N 0.5000
2.0000 0.0000N
1.5000R 0.0000N
1.0000 0.2000
3.0000 0.3000
0.5000 0.0000N
1.5000 9.0000
1.0000 0.0000N

25
0.0000N
0.0000N
0.0000N
0.5000
0.5000R

32 31
1.5000 0.0000N
5.0000 0.0000N
0.2000 73.0000
2.0000 11.0000
11.0000R

3
1.0000
2.0000
61.0000
2.0000
11.0000
10.0000 R
3.0000
3.0000
186.0000
0.3000
0.3000
0.3000 R
0.0000N
0.0000N
0.2000
0.7000
0.0000N
0.0000N

24
1.0000
0.0000N
0.0000NR
0.0000N
0.2000

4
0.2000 0.2000
0.0000N 0.5000
0.0000N 0.0000N
4.0000 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.3000 R 0.0000NR
0.0000N 0.0000N
0.3000 0.0000N
0.0000NR0.7000

23
0.0000N
0.0000N
0.2000
0.3000

2
1.0000 0.5000
0.2000 2.0000
0.0000N51.0000
0.0000N 8.0000
0.0000N 2.0000
0.0000N 1.0000
0.0000N 0.0000N
0.0000N 0.2000
0.2000R

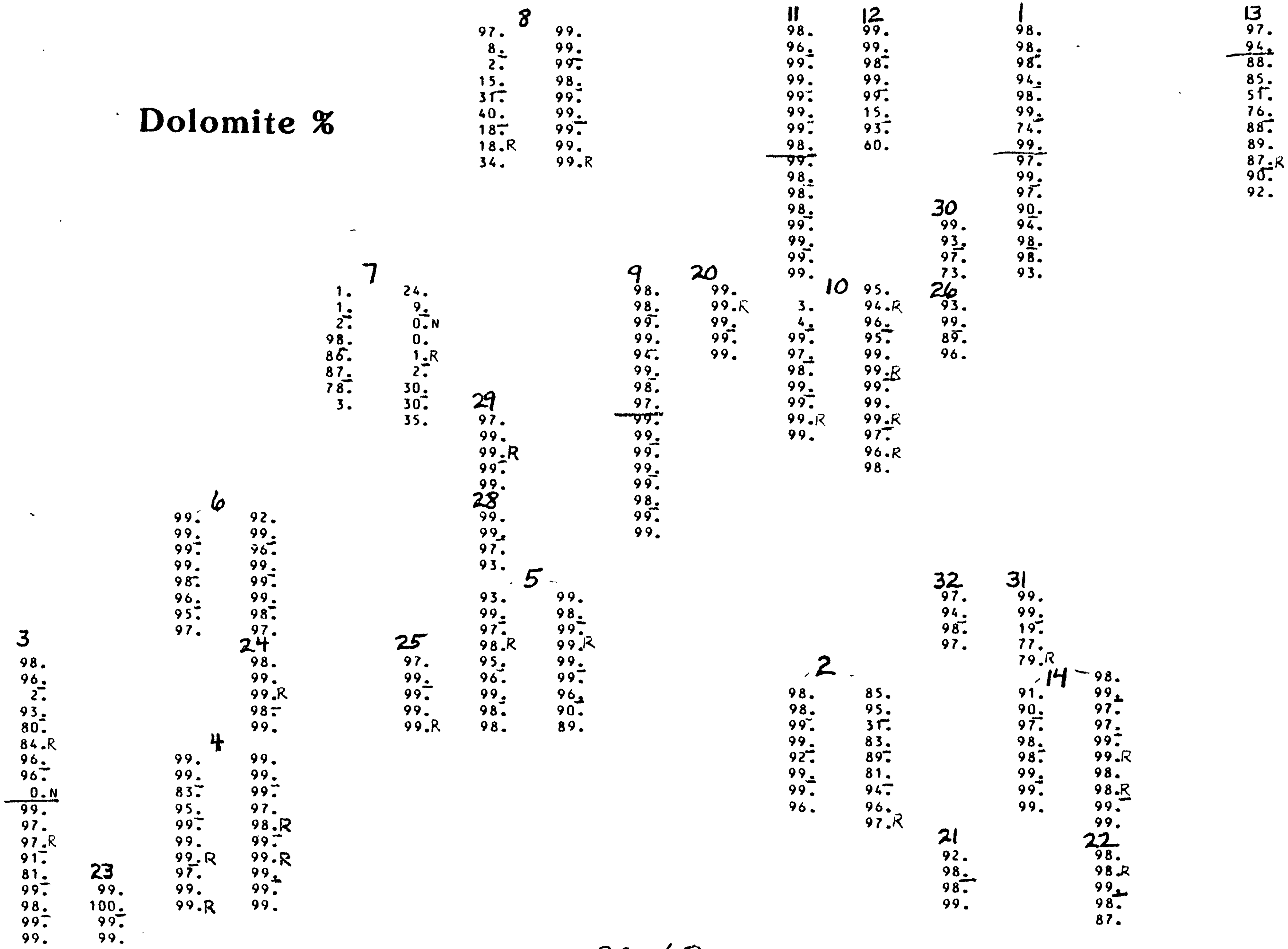
14
0.0000N
0.3000 0.0000N
0.2000 2.0000
0.0000N 2.0000
0.0000N 0.3000
0.0000N 0.2000R
0.2000 1.0000
0.0000N 0.7000R
0.2000 0.0000N
0.0000N

21
5.0000
0.7000
1.5000
0.1000

22
0.0000N
0.2000R
0.5000
0.2000
1.5000

p. 2C-67

Dolomite %


8
97. 8. 2. 15. 31. 40. 18. 18.R 34.
99. 99. 99. 98. 99. 99. 99. 99. 99.R
11
98. 96. 99. 99. 99. 99. 99. 98. 99. 98. 98. 98. 99. 99. 99. 99.
12
99. 99. 98. 99. 99. 15. 93. 60.
1
98. 98. 98. 94. 98. 99. 74. 99. 97. 99. 97. 90. 94. 98. 98. 93.
13
97. 94. 88. 85. 51. 76. 88. 89. 87.R 90. 92.
30
99. 93. 97. 73.
26
93. 99. 89. 96.
7
1. 1. 2. 98. 86. 87. 78. 3.
24. 9. 0.N 0. 1.R 2. 30. 30. 35.
9
98. 98. 99. 99. 96. 99. 98. 97. 99. 99. 99. 99. 99. 98. 99. 99.
20
99. 99.R 99. 99. 99.
10
3. 4. 99. 97. 98. 99. 99. 99.R 99.
95. 94.R 96. 95. 99. 99.R 99. 99. 99.R 97. 96.R 98.
29
97. 99. 99.R 99. 99.
28
99. 99. 97. 93.
6
99. 99. 99. 99. 98. 96. 95. 97.
92. 99. 96. 99. 99. 99. 98. 97.
24
98. 99. 99.R 98. 99.
5
93. 99. 97. 98.R 95. 96. 99. 98. 98.
99. 98. 99.R 99. 99. 96. 90. 89.
25
97. 99. 99. 99. 99.R
3
98. 96. 2. 93. 80. 84.R 96. 96. 0.N 99. 97. 97.R 91. 81. 99. 98. 99. 99.
23
99. 100. 99. 99.
4
99. 99. 83. 95. 99. 99. 99.R 97. 99. 99.R
99. 99. 99. 97. 98.R 99. 99.R 99. 99. 99.
32
97. 94. 98. 97.
31
99. 99. 19. 77. 79.R
2
98. 98. 99. 99. 92. 99. 99. 96.
85. 95. 31. 83. 89. 81. 94. 96. 97.R
14
91. 90. 97. 98. 98. 99. 99. 99.
98. 99. 97. 97. 99. 99.R 98. 98.R 99. 99.
22
98. 98.R 99. 98. 87.
21
92. 98. 98. 99.

Hematite %

8
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N
0.0000N 0.0000NR

11
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

12
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

1
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
→0.3000
0.0000N
→0.3000
0.0000N
0.0000N
0.0000N
→0.3000
0.0000N

13
0.0000N
0.0000N
0.0000N
0.0000N
5.0000
2.0000
0.0000N
0.0000N
0.0000NR
0.5000
0.0000N

30
0.0000N
0.0000N
0.0000N
0.0000N

7
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N

9
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

20
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N

10
0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000NR
0.0000N 0.0000N
0.0000NR
0.0000N

26
0.0000N
0.0000N
0.0000N
0.0000N

29
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

28
0.0000N
0.0000N
0.0000N
0.0000N

6
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N

5
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N

25
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

3
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
→0.5000
0.0000N
0.0000N
0.0000N
0.0000N

24
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

4
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000NR0.0000NR
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR0.0000N

23
0.0000N
0.0000N
0.0000N
0.0000N

32
0.0000N
0.0000N
0.0000N
0.0000N

31
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

2
0.0000N 0.0000N
0.0000N 0.0000N
→0.1000 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000NR

14
0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N 0.0000NR
0.0000N 0.0000N
0.0000N

21
0.0000N
0.0000N
0.0000N
0.0000N

22
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N

Goethite %

```
                                                                  8                              11       12                 1                          13
                                                        0.3000   0.0000N                    0.2000   0.0000N           0.2000                     0.3000
                                                        0.5000   0.3000                     0.2000   0.0000N           0.0000N                    0.3000
                                                        0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N                    0.0000N
                                                        0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N                    1.0000
                                                        0.0000N  0.0000N                    0.0000N  0.0000N           0.0000N                    2.0000
                                                        1.0000   0.3000                     0.0000N  0.0000N           0.0000N                    2.0000
                                                        0.5000   0.0000N                    0.0000N  0.0000N           0.0000N                    1.0000
                                                        0.5000 R 0.0000N                    0.0000N  0.0000N           0.0000N                    1.0000
                                                        0.0000N  0.0000NR                   0.0000N                    0.0000N                    0.5000 R
                                                                                            0.0000N                    0.0000N                    0.5000
                                                                                            0.0000N                    0.0000N                    1.0000
                                                                                            0.3000                 30  0.0000N
                                                                                            0.0000N           0.0000N  0.2000
                                                                                            0.0000N           0.0000N  0.3000
                                                                                            0.0000N           0.0000N  0.0000N
                                               7                               9       20   0.0000N           0.0000N  0.0000N
                                      0.0000N  0.0000N                    0.0000N  0.0000N         100.0000N        26
                                      0.0000N  0.0000N                    0.0000N  0.0000NR0.0000N  0.0000NR0.0000N
                                      0.0000N  0.0000N                    0.0000N  0.0000N  0.0000N  0.0000N  0.0000N
                                      0.0000N  0.0000N                    0.0000N  0.0000N  0.0000N  0.0000N  0.0000N
                                      0.0000N  0.0000NR                   0.0000N  0.0000N  0.0000N  0.2000   0.0000N
                                      0.0000N  0.0000N                    0.0000N           0.0000N  0.2000 R
                                      0.0000N  0.0000N                    0.0000N           0.0000N  0.0000N
                                      0.0000N  0.0000N        29          0.0000N           0.0000N  0.0000N
                                               0.0000N  0.0000N           0.0000N           0.0000NR0.0000NR
                                                        0.0000N           0.0000N           0.0000N  0.0000N
                                                        0.0000NR          0.0000N                    0.0000NR
                                                        0.2000            0.0000N                    0.0000N
                                                        0.0000N           0.0000N
                              6                              28           0.0000N
                    0.0000N  0.0000N                    0.0000N           0.0000N
                    0.0000N  0.1000                     0.0000N           0.0000N
                    0.0000N  0.0000N                    0.0000N
                    0.0000N  0.0000N                    0.0000N
                    0.0000N  0.0000N                             5                                                 32       31
                    0.0000N  0.0000N                    0.0000N  0.1000                                       0.7000   0.0000N
                    0.0000N  0.0000N                    0.0000N  0.0000N                                      0.2000   0.1000
       3            0.0000N  0.0000N                    0.0000N  0.0000N                                      0.5000   0.0000N
                                  24                25  0.0000NR0.0000NR                                      0.3000   0.3000
  0.0000N                    0.0000N           0.2000   0.0000N  0.0000N                                               0.3000 R
  0.0000N                    0.0000N           0.0000N  0.0000N  0.0000N                             2                       140.5000
→ 2.0000                     0.0000NR          0.0000N  0.0000N  0.0000N                    0.2000   0.0000N           0.0000N  0.3000
  0.0000N                    0.0000N           0.0000N  0.0000N  0.2000                     0.1000   0.0000N           0.0000N  0.3000
  0.0000N                    0.0000N           0.0000NR0.0000N  0.0000N                     0.1000   0.0000N           0.0000N  0.0000N
  0.0000NR                   4                                                              0.0000N  0.0000N           0.0000N  0.2000
  0.0000N           0.0000N  0.0000N                                                        0.0000N  0.0000N           0.0000N  0.1000 R
  0.0000N           0.0000N  0.0000N                                                        0.2000   0.7000            0.0000N  0.0000N
  0.0000N           0.0000N  0.0000N                                                        0.3000   0.0000N           0.0000N  0.0000NR
  0.0000N           0.0000N  0.0000N                                                        0.5000   0.0000N           0.0000N  0.1000
  0.1000            0.0000N  0.0000NR                                                                0.0000NR                   0.1000
  0.0000NR          0.0000N  0.0000N                                                                          21                22
  0.0000N           0.0000NR0.0000NR                                                                          0.0000N           0.0000N
  0.0000N       23  0.3000   0.0000N                                                                          0.0000N           0.2000 R
  0.0000N  0.0000N  0.0000N  0.0000N                                                                          0.0000N           0.1000
  0.0000N  0.0000N  0.0000NR0.0000N                                                                           0.0000N           0.0000N
  0.0000N  0.0000N                                                                                                              1.0000
  0.0000N  0.0000N
```

p. 2C-70

Anatase %

8
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
-0.1000

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

11
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
-0.0200
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

12
0.0000N
0.0000N
-0.0100
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

1
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

13
-0.0100
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
-0.0200
0.0000N
0.0000NR
0.0000N
0.0000N

30
0.0000N
0.0000N
0.0000N
0.0000N

7
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N

9
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
-0.0100
0.0000N
0.0000N

20
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

10
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0100
0.0000N
0.0000NF
0.0000N

0.0000N
0.0000NF
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000NF
0.0000N
0.0000NR
0.0000N

26
0.0000N
0.0000N
0.0000N
0.0000N

29
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

28
0.0000N
0.0000N
0.0000N
0.0000N

6
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

5
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

25
-0.0100
0.0000N
0.0000N
0.0000N
0.0000NR

3
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
-0.0100
0.0000NR
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

23
0.0000N
0.0000N
0.0000N
0.0000N

24
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000N

4
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
-0.0300
0.0000N
0.0000NR

0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N

32
0.0000N
0.0000N
0.0000N
0.0000N

31
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR

2
0.0000N
-0.0100
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
-0.0100
0.0000NR

14
0.0000N
0.0000N
0.0100
0.0200
0.0000N
0.0000N
0.0000N
0.0000N

0.0000N
0.0000N
0.0000N
0.0000N
0.0000N
0.0000NR
0.0100
0.0000NR
0.0100
0.0000N

21
0.0000N
0.0100
0.0000N
0.0000N

22
0.0000N
0.0000NR
0.0000N
0.0000N
0.0000N

p. 2C-71

Hornblende %

```
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                        0.0000N 0.0000N         0.0000N         0.0000N 0.0000N
                                                0.0000N         0.0000N         0.0000N 0.0000N
                                                0.0000N         0.0000N                 0.0000N
                                                0.0000N         0.0000N                 0.0000N
                                                0.0000N         0.0000N
                        6                                       0.0000N
                0.0000N 0.0000N                 0.0000N         0.0000N
                0.0000N 0.0000N                 0.0000N         0.0000N
                0.0000N 0.0000N                 0.0000N
                0.0000N-0.0100 ←                0.0000N
                0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
3                                               0.0000N 0.0000N                                 0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                         0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                                 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000NR                                                                        0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
→5.0000         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                         0.0000N                 0.0000N
0.0000NR        0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N                                                                                                 0.0000N
0.0000N 0.0000N
```

p.2C-72

Apatite %

```
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                0.0000N 0.0000N                 0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N                 0.0000N
                                                                                0.0000N                 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                                                                0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                        0.0000N 0.0000N         0.0000N         0.0000N 0.0000N
                                                0.0000N         0.0000N         0.0000N 0.0000N
                                                0.0000N         0.0000N                 0.0000N
                                                0.0000N         0.0000N                 0.0000N
                                                0.0000N         0.0000N
                                                                0.0000N
                0.0000N 0.0000N                 0.0000N         0.0000N
                0.0000N 0.0000N                 0.0000N         0.0000N
                0.0000N 0.0000N                 0.0000N
                0.0000N 0.0000N                 0.0000N
                0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                                                0.0000N 0.0000N                                 0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                         0.0000N
                                                                                         2
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                                 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N                                                                         0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N→3.0000          0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                         0.0000NR                0.0000N
0.0000N         0.0000N 0.0000N
0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N         0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N 0.0000N 0.0000N                                                                 0.0000N         0.0000N
0.0000N 0.0000N                                                                                                 0.0000N
0.0000N 0.0000N
```

Pyrite %

```
                                                           8                        11      12              1                       1
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 0.0000N 0.0000N                 0.0000N 0.0000N        →0.1000                  0.0000N
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 0.0000NR0.0000N                 0.0000N 0.0000N         0.0000N                 0.0000N
                                                 0.0000N 0.0000NR               →0.1000                  0.0000N                 0.0000NR
                                                                                 0.0000N                →0.1000                  0.0000N
                                                                                 0.0000N                 0.0000N                 0.0000N
                                                                                 0.0000N            30   0.0000N
                                                                                 0.0000N         0.0000N 0.0000N
                                                                                 0.0000N         0.0000N 0.0000N
                                                                                 0.0000N         0.0000N 0.0000N
                                          7                           9      20  0.0000N         0.0000N 0.0000N
                                 0.0000N 0.0000N                 0.0000N 0.0000N       100.0000N     26
                                 0.0000N 0.0000N                 0.0000N 0.0000NR0.0000N 0.0000NR0.0000N
                                 0.0000N 0.0000N                 0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                 0.C000N 0.0000N                →0.1000  0.0000N 0.0000N 0.0000N 0.0000N
                                 0.0000N 0.0000NR                0.0000N 0.0000N 0.0000N 0.0000N 0.0000N
                                 0.0000N 0.0000N                 0.0000N         0.0000N 0.0000NR
                                 0.0000N 0.0000N                 0.0000N         0.0000N 0.0000N
                                 0.0000N 0.0000N     27          0.000CN         0.0000N 0.0000N
                                         0.0000N 0.0000N         0.0000N         0.0000NR0.0000NR
                                                 0.0000N         0.0000N         0.0000N 0.0000N
                                                 0.0000NR        0.0000N                 0.0000NR
                                                 0.0000N         0.0000N                 0.0000N
                                                 0.0000N         0.0000N
                          6                          28          0.0000N
                 0.0000N 0.0000N                 0.0000N         0.0000N
                 0.0000N 0.0000N                 0.0000N         0.0000N
                 0.0000N 0.0000N                 0.0000N
                 0.0000N 0.0000N                 0.0000N
                 0.0000N 0.0000N                         5                                          32      31
                 0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                 0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
     3           0.0000N 0.0000N                 0.0000N 0.0000N                                 0.0000N 0.0000N
                              24              25 0.0000NR0.0000NR                                0.0000N 0.0000N
 0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                                         0.0000NR
 0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                         2                     140.0000N
 0.0000N                 0.0000NR        0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000N                 0.0000N         0.0000N 0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
→0.3000                  0.0000N         0.0000NR0.0000N 0.0000N                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000NR                4                                                      →0.0100  0.0000N         0.0000N 0.0000N
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000NR
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000NR
 0.0000N         0.0000N 0.0000N                                                 0.0000N 0.0000N         0.0000N 0.0000N
 0.0000N         0.0000N 0.0000NR                                                        0.0000NR                0.0000N
 0.0000NR        0.0000N 0.0000N                                                                      21              22
 0.0000N         0.0000NR0.0000NR                                                                0.0000N        →0.1000
 0.0000N      23 0.0000N→0.0000N                                                                 0.0000N         0.0000NR
 0.0000N 0.0000N 0.0000N 0.1000                                                                  0.0000N         0.0000N
 0.0000N 0.0000N 0.0000NR0.0000N                                                                 0.0000N         0.0000N
 0.0000N 0.0000N                                                                                                 0.0000N
 0.0000N 0.0000N
```

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Dolomite Crystallinity

(see text)

8

3.6250
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B

5.2170
3.3850
4.3850
4.1450
3.2580
4.1120
3.0770
3.2810
3.6490R

11

4.0900
4.5600
4.3550
3.9650
4.3270
4.1480
3.8830
4.1850
4.3600
4.8730
3.3640
2.9850
3.9520
4.7270
3.6440
4.1130

12

5.0210
4.8180
4.4310
4.1870
4.5770
0.0000B
4.8210
3.5000

1

4.1670
4.0380
4.0830
4.0540
3.8930
4.0000
0.0000B
4.1310
4.0550
4.4310
4.1670
3.6720
4.0000
3.1540
4.1360
4.1350

13

3.7760
3.9090
4.6670
3.6090
0.0000B
0.0000B
4.6900
3.7270
4.2550R
4.8570
4.1000

30

4.0370
4.4120
4.1960
0.0000B

7

0.0000B
0.0000B
0.0000B
3.7270
3.3330
3.4210
4.7500
0.0000B

0.0000B
0.0000B
0.0000B
0.0000B
0.0000BR
0.0000B
2.1820
0.0000B
0.0000B

9

4.2500
4.8130
4.5280
4.4230
4.7600
4.3640
5.3330
3.9620
4.8100
5.6760
5.2670
5.4040
4.3280
5.0610
4.0000
5.0000

20

4.9620
4.9600R
3.9450
4.4120
4.3510

10

0.0000B
5.1200
4.7500
4.6810
4.2500
4.3100
4.6460R
3.9820

4.5740
4.5240R
4.7960
5.3060
4.8000
3.9640R
5.0560
4.0830
3.6190R
4.8510
4.4000R
5.2500

26

4.1820
4.7600
4.0410
4.6000

29

4.2000
5.3960
4.1670R
3.8180
3.9660

28

4.9450
4.0000
4.4330
4.2080

6

5.5010
4.8890
4.7870
4.4230
5.2290
5.3120
4.4200
4.6250

3.1540
4.3130
3.9600
4.3600
5.2880
4.6400
3.5610
5.0380

5

3.0180
3.8450
3.7270
3.6840R
4.0690
4.9550
4.3020
4.3850
5.7110

3.8550
4.1150
2.9260
3.0000R
2.7780
3.6330
3.6150
3.6600
3.3650

25

3.5450
5.2000
5.1400
6.5000
4.7270R

32

4.0380
4.3650
4.5000
4.5510

31

5.3060
4.9600
0.0000B
1.8790
1.9400R

3

3.5960
4.8040
0.0000B
3.3270
0.0000B
0.0000BR
5.1660
4.5000
0.0000B
3.6720
4.0000
3.6000R
3.4330
2.8600
3.6720
4.4910
3.8390
4.7780

24

4.7830
5.5320
4.7170R
4.3100
5.0000

2

4.3600
5.1670
4.7600
4.9060
3.0830
4.3750
3.3870
4.6600

2.7420
2.5150
0.0000B
2.1000
2.9020
1.9530
3.4210
3.3000
2.8060R

14

4.3330
4.1630
4.4510
3.6500
4.1030
3.3620
3.9090
4.5000

3.5960
3.7270
4.3400
3.9640
3.9170
4.3200R
4.1000
4.7500R
4.4070
4.0170

4

4.2310
5.8370
4.0210
4.2450
3.5000
4.8000
4.3750R
3.7030
5.0470
3.7420R

4.6610
4.5370
4.7400
5.2000
3.8390R
4.3640
4.8600R
3.9330
4.0360
4.5190

23

4.4170
4.0340
4.2450
3.8450

21

1.5290
4.3040
4.4710
6.0870

22

4.2910
4.2730R
3.9640
5.2670
3.8680

APPENDIX 3.--Explanation of headings of 3A, 3B, and 3C

ELEMENTS

Si - silicon
Al - aluminum
Fe - iron
Mg - magnesium
Ca - calcium

Na - sodium
K - potassium
Ti - titanium
P - phosphorus
F - fluorine

S - sulfur
T-C - total carbon
O-C - organic carbon
C-C - carbonate carbon
Ag - silver

As - arsenic
B - boron
Ba - barium
Be - beryllium
Br - bromine

Cd - cadmium
Co - cobalt
Cr - chromium
Cu - copper
Ga - gallum

Ge - germanium
Hg - mercury
I - iodine
La - lanthanum
Li - lithium

Mn - manganese
Mo - molybdenum
Nb - niobium
Nd - neodymium
Ni - nickel

Pb - lead
Pr - praseodynium
Rb - rubidium
Sb - antimony
Sc - scandium

Se - selenium
Sn - tin
Sr - strontium
Th - thorium
U - uranium

V - vanadium
Y - yttrium
Yb - ytterbium
Zn - zinc
Zr - zirconium

MINERALS

I - illite
X - mixed-layer
K - kaolinite
Cl - chlorite
Co - corrensite

Ta - talc
T-Cl - total clay
Q - quartz

K-sp - K-feldspar
Ca - calcite
Do - dolomite
He - hematite
Go - goethite

An - anatase
Hb - hornblende
Ap - apatite
Py - pyrite

Appendix 3A.--High element and mineral concentration in sandstones of the Tippecanoe sequence.

(Percentiles (p), table 3A; 1,>p90; 2,>p95; 3,>p97.5;>4, p99;>5, maximum)

Sample number		ELEMENTS																																																	MINERALS																
		Si	Al	Fe	Mg	Ca	Na	K	Ti	P	F	S	T-C	O-C	C-C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	Li	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	Cl	Co	Ta	T-Cl	Q	K-Sp	Ca	Do	He	Go	An	Hb	Ap	Py
01AS	U																	1																																																1		2		1			
	L										1				1																1	3																1	1									1								1		1					
01BS	U	1																																																		4													1		1			
	L																																																																	1		1			
01CS	U													1				2																																2	2		5																		
	L	1															1														2																					1															1			
01DS	U																1	2														3																	2																	1			2		2			
	L													1																																														1					1			
01ES	U	1																1																																2	5		4		1						1							2			
	L													1				1																		2																																1					1			
01FS	U													2				1																																				1													1			
	L																																											1												2							1						1			
01GS	U																																																		1																			1			
	L																1														1																				1		2																2			
01HS	U	1																												1												3																					1						1			
	L																1																																		2										1						1			
02AS	U																1									4			3	1																								4					1											
	L																																																						3					1											
02BS	U				1	1								1		1						1													2																								1													1	1					
	L				1								1		1						1													3																																							2	1					
02CS	U					1																											4					2																				4					5						
	L				1	1								1		1																		3					2															1							4					1	1					
02DS	U																															1																													3											
	L																															3					1															1								3											
02ES	U				1	1							2	1		1	4	1				1	4			1								2					4														4						3								1	1	1			
	L			1	2	3				2	1	1	2		2	5	3				1	1			2			1				4					4									1				5														1	2		3			3	
02FS	U																	1	1				4			2								2					3						2							3					1															
	L				1	1						1	1		1	1	1				5											3					4																3				1	4								1	1				
02HS	U																										1				4								1				3							2																				
	L																										1					1					1			2				1							1							3										
03AS	U																																						1																							1											
	L	1																																																												1											
03BS	U																																						1		4																					1											
	L	1																																																												1											
03ES	U																																								3												1				3		1										
	L																																																					2		4		5	2			2					4		
03FS	U																																																																			
	L																															1																				1																	
03GS	U										1																																															4				1					4		
	L						4																		1																																	5	3	2				1		2				
03HS	U																																																								1				3					5		
	L																																																							3		3		1											
04AS	U																																																																			
	L																																									5																		1											
04BS	U																																																			1																
	L	1																																																												1											
04CS	U																																																											1											
	L																																																											1											
04DS	U																																																																			
	L																																																											1											
04ES	U													1			1																																														1							
	L										1																																																											
04FS	U																																																											1											
	L																																																											1											
04GS	U																																																											1											
	L																																																																			
04HS	U																																																											1											
	L																																																											1											

Appendix 3A.--Continued

Sample number		ELEMENTS																																																	MINERALS															
													T-O-C-																																													T-		K-								
		SI	AI	Fe	Mg	Ca	Na	K	TI	P	F	S	C	C	C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	LI	Mn	Mo	Nb	Nd	NI	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	CI	Co	Ta	CI	Q	Sp	Ca	Do	He	Go	An	Hb	Ap	Py
05AS	U																									2				3	1								4																		1									
05AS	L																									2				3									2		1																1									
05BS	U																									4	2			3									2																			1									
05BS	L																									2				3									3		1																1									
05CS	U	1																							4																																												
05CS	L																																																																			
05DS	U																																																											1									
05DS	L																																																																			
05ES	U																																																																			
05ES	L												1																					2													2	1																		
05FS	U																1																																																2				
05FS	L																1																																																			
05GS	U																																																											1									
05GS	L	1																																								3																									
05HS	U																						2																																				3							
05HS	L	1															1																	1																							1									
06AS	U																																							2																			1									
06AS	L																																											1																									
06BS	U																																							1			1																									
06BS	L																																																											1									
06CS	U																												2		1									1																			5									
06CS	L																1	1										2	1			2									1		1																					1				
06DS	U																																															2																					
06DS	L																																																											1									
06ES	U	1																																																										1									
06ES	L	1																																																										1									
06FS	U																																	2		1																								1									
06FS	L																																																											1									
06GS	U																											2																																1									
06GS	L	1																																																										1									
06HS	U																																																																			
06HS	L																1							2																1					1	1																					
07AS	U																																																											1									
07AS	L	1											1																																																						
07BS	U																																																											1									
07BS	L																1										1															2									2						1											
07CS	U																													3																																						
07CS	L																																																																			
07DS	U																																																											1									
07DS	L											1														1																																										
07ES	U																																																											1									
07ES	L																											1												2																												
07FS	U																											5												1			2							1																		
07FS	L																											3																																	1									
07GS	U															1												1												1																													
07GS	L																1																																																			
07HS	U				1	1					2	1	1		1		3							3	1			3								1				5				1			4			1												1	1					2	
07HS	L																											1																																									

Appendix 3A.--Continued

Sample number		ELEMENTS																																																		MINERALS																
													T-	O-	C-																																										T-		K-									
		Si	Al	Fe	Mg	Ca	Na	K	Ti	P	F	S	C	C	C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	Li	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	Cl	Co	Ta	Cl	Q	Sp	Ca	Do	He	Go	An	Hb	Ap	Py
0.8AS	U	1																																																								1									
	L																																																									1									
0.8BS	U																																																									1									
	L																							2								1																										1									
0.8CS	U	1																																																								1									
	L																				2								4																													1									
0.8DS	U																																																									1									
	L																						4																																			1									
0.8ES	U																																																									1									
	L																											1																														5									
0.8FS	U																															1																						1					1									
	L						1																																															1			3		1									
0.8GS	U	1																																																								1									
	L	1																										1						2																								1									
0.8HS	U		2					1	1		3							2						3		2					1								2	4					1		1				3	5						5										
	L															3	1											1												3																			1					1				
0.9AS	U		2	1			2	2	1	2	3	1				4		1					2	2	2	4										2	1		2		1			1	1			1	1			2						1		3							2	
	L		2	1			3	3	1	1							1	1					2	2	2	2										3	1		2						1			1	1		1	1								3							1	
0.9BS	U																																																																			
	L			2														1					1													3																1	2					1										
0.9CS	U																	1							2																											1												1				
	L		1					1		1		3						1						1		2										1			1					1			1					1		1				1		1				3			1	
0.9DS	U	1																																								1																	1									
	L													3																																																		1				
0.9ES	U																																																					1					1									
	L																																										2																1									
0.9FS	U	1																																									1																									
	L																															1																																1				
0.9GS	U			1																			2		3											3																												2				
	L									1																										1																		1									1				1	
0.9HS	U													4																																													1									
	L	1																																																									1									
1.0AS	U		1	4	1	1	1	1		1		1	1		1						3						1		4		1	2							1				1	1		1														1		2	4				1	
	L			3	4	3	2						4		4						2		5		4				3			2				3						3																				4	4					
1.0BS	U											1									1				1						1																2															1		1				
	L			1													3				1				2						1																4								1													
1.0CS	U			2	3	4				1	2	1	3		3						4																						1																		1	4	3				1	
	L			3	4	4	2				1	1	4		4						4							1														1	1																		1	4	4					
1.0DS	U			1	3	4	2				1	1	3		3						3								2														3																		2	3	2					
	L			3	3	3	1			1	1		3		3						2																																							1	3	3	4					
1.0ES	U													4																	1			2																																		
	L																												1		1		5																																			
1.0FS	U				1	1															2															1																										1		1				
	L				1	1				1											2															1																									1	1		1				

Appendix 3A.--Continued

Sample number		ELEMENTS																																																		MINERALS																
													T-O-C-																																											T-		K-								
		Si	Al	Fe	Mg	Ca	Na	K	Ti	P	F	S	C	C	C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	Li	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	Cl	Co	Ta	Cl	Q	Sp	Ca	Do	He	Go	An	Hb	Ap	Py
13AS	U		2	1			3	2	2								3	2	3				1	2		4	1				2					1			2		1			3	3		2	1	2		2		4	5				3		2				3	2			
	L		3				4	3	2									1	3				2	3		2								2		3	1		3		1			3	3		1	2	2		2	1	3	2				2		3				2	3			
13BS	U		1				1	1	1									1	1				1			2										2	1		1					1	1					2			2	1						2				4				
	L		4				4	2	2									1	3					2		4					2			2			1		5		3			2	1		2	2	2		2	2	2	4				3		3				1				
13CS	U		1				2	1	1								1	1	2				2	1		2	2					4		2		1	3		1					3	5	4	1	1	1	1			3	1						1	4			4	2			
	L		3				3	4	2								3	2	3					4	2	4										3	3		4		1			4	2		4	1	1	1	1	3						2		4					3			
13DS	U		2				2	4	2								2	1	3				1	1		2				3						1	1		3		3	1		3	1	1	1	2	1	1	1	1								4				2	3			
	L		5	1			4	5	3	1	1			4			1	4	3	4			4	3	2	5				1				2		3	2		4		3			5	1		4	2	3	3	4		5					3		4				2				
13ES	U																2																																	2			2										1	1				
	L																	2																																									1								1	
14AS	U		1					1	4	2	2							2	1				3	1	2					3		1		4			2		2		3	2		4	2	3	2	4	3		3	4		1				4							4			
	L		3				1	1	4									5	1				4	4	1	2				1	1			4		3	1		2		3			2	2	3	2	3	3		3	4		4				4		1			2		3			
14BS	U		1						2	3	1							2	3					3	4	2			5	1	1	1			5		3		1		3			4		4	5	3	2			2		4				2			4				3			
	L								1																							1												1							2		1	1						1	1				1			
14CS	U																																									1		1							1									1					1			
	L			5													4	2							4		2									3										1	2	3	2	2	2		2										3	4				
14DS	U								1															2	5				3			4												1		1								3									1		2			
	L		4	1			5	3	5									2	1				1	3	1	4	1			1	1			2		2			3		3	2		1	4	2	2	2	2		3	3	3					4		3			2		5			
14ES	U		1					1	1	1								2					2						1							3			1									3	2			1								1								
	L		1					2	3									2	1				2	2	2	2				1									2		1		1		2		2	1	1		1	3						2		2								
14FS	U		1	2				1	1	5	5	1						2			1			1	1	2		1	3	1							2		1		3			1	3	5	1	4	4			1						1		1							5	
	L		1					2	3									4						2		2				3					4				1		1				1	1	1	2	1			3						2		1								
14GS	U													2				1										2																		1					3			1						1				1	1			
	L									2	1																	2																		2		2	1					3						1							2	
14HS	U																	1																												1		3	2		1			3						1								
	L		1					1	1	3	3						1	1					2				1	4						2		1	1							1	4	3		4	3		2			4						1							3	
22AS	U				1	2							2		2						1																1													2											1	1						
	L				1	1				1			1		1		2				1															1	2			1			2	1		1				3											1	1		3	1			
22CS	U				1	1				3	4		1		1														2							1	1							1		1																		1			4	
	L								1	4	3																		2								1							1		2																					4	
23AS	U																																							1																			1									
	L																																																										5									
23CS	U																																																																			
	L																																									1																										
24AS	U																																																										1									
	L																																																										1									
24CS	U																																																										1									
	L													1																																																	1					
25AS	U																																										5																									
	L																																																										1									
25CS	U																			1														2																									1									
	L																																																										1									
26AS	U				2	2							2		2						3											1	5			1																									1	2						
	L							1						5			3								2		1																											1						1					1			
26CS	U			2	2	2	2						2		2		2				1			1												1																								1		2	3					
	L			1	2	2	2	1			2		2		2						1			1																		1	2				1					1						1		1		2						
27AS	U																								2			3								1														2											1							
	L																																																										1									
27CS	U																																																																			
	L																																										4																									
28AS	U																											1												1																												
	L																																																																			
28CS	U																												2																																							
	L																																																																			
29AS	U																																																																			
	L																																																															1				
29C	U																																																																			
	L																																																																			

Appendix 3A.--Continued

Sample number		ELEMENTS																																																		MINERALS																
													T-	O-	C-																																											T-		K-								
		Si	Al	Fe	Mg	Ca	Na	K	Ti	P	F	S	C	C	C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	Li	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	Cl	Co	Ta	Cl	Q	Sp	Ca	Do	He	Go	An	Hb	Ap	Py
31AS	U										1										1				1						3																			1						5					2							
	L		1				2					5							5	5					3		5	4			5						1		1	4		1		3								2						1		1								
31CS	U								1	4	4						1	1							1					1					4				1			5			2	2	2	4	3					1						1							4	
	L			2																																																												1			
32AS	U			1	5	5							5		5						5																																								3	5		3				
	L									1	2							4														1														1		2	2			1									1							
32CS	U									2	3							4									2																			2			1		3	2						1									2	
	L									1	2							4									3																			1			2		2																1	

Appendix 3B.--High element and mineral concentrations in shales of the Tippecanoe sequence.

(Percentiles (p), table 3B; 1,>p90; 2,>p95; 5, maximum)

Sample number		ELEMENTS																																																	MINERALS																
		Si	Al	Fe	Mg	Ca	Na	K	Ti	P	F	S	T-C	O-C	C-C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	Li	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	Cl	Co	Ta	T-Cl	Q	K-Sp	Ca	Do	He	Go	An	Hb	Ap	Py
03EH	U					5							2		2													1	5																										2	5	5				2							
	L															2	1																																			1				1													
03FH	U				1	1																	1									2											5												5						1					2		
	L			5		1																	5				5					5											1																							5		
03GH	U						1									1	1										1													5						2	5			1							1			5								
	L																																							2							5													2								
03HH	U													5					1								2						5			5										5				5			2													1		
	L				5		5												2														1			1																	2				5				1							
07GH	U	1															2											1																																								
	L					2							5		5		1											1	1			1																													5							
08GH	U	2												1		5			2									2					1									1					1												5									
	L													2					5																							2																	1									
08HH	U	5																															1				1			1		5					1												2									
	L							1	1			2		1										1									1	2	1				1		1						1																					
09BH	U							2												1										1																					1									1			5					
	L																																																														1					
10CH	U																																																											1		1						
	L																				2																																									1	1					
13AH	U		2									1												1		1															1																	2										
	L											5								1				1		1	2	5																5								1													1			
13CH	U		1																					1		1					1				1						1													2											1			
	L		1																				1	1							1				1	1					1													5														
13DH	U																									1				1		1				1			1		1				1							1						1										
	L											1											1			1									1													2																	1			
13EH	U		5																					1		1				1					1				1		1											5						2										
	L						5	2																		1				1					1				2		5		1	5								5						2							1			
14AH	U								2										1	1																	2							1				2	2		1			2											5			
	L			1					1			1												1	2	1				1		1			2						1				5	2				2													1		1			
14BH	U			2					5									2		1				1	1				1	5				2			2							1	2			2	2		1			2											5			
	L	1																			5														5			5											1										1									
14DH	U			1				5										2					1		1							1							5						2	1				2		1													1			
	L																																		1																5									2								
31AH	U				2	1					5		1		1																5																								2							2						
	L				1	1					2		1		1						1								2		2																						2							1		5						
31BH	U						1				1									5														1			2				1					1		5	2		1									1			1		1			
	L						2				1						5	2		5	1													1							1																								1			

Appendix 3C.--High element and mineral concentration in carbonates of the Tippecanoe sequence.

(Percentiles (p), Table 3C; 1,>p90; 2,>p95; 3,>p97.5; 4,>p99; 5, maximum)

Sample number		ELEMENTS																																																		MINERALS																
													T-	O-	C-																																										T-		K-								
		Si	Al	Fe	Mg	Ca	Na	K	Ti	P	F	S	C	C	C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	Li	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	Cl	Co	Ta	Cl	Q	Sp	Ca	Do	He	Go	An	Hb	Ap	Py
0.1AC	U						3																																																													
	L						1																																														2										3					
0.1BC	U						2				1		1		1										2							1																																1				
	L						2												1						4							1															1																					
0.1CC	U																																																										1									
	L		1				1																																																					1			3					
0.1DC	U						1						1		1																																						2									1						4
	L						2																				1		1																																		3					
0.1EC	U																																																	1			1									1						
	L																																																				2								1							
0.1FC	U				1																																						1																			1						
	L																																												1								2															
0.1GC	U						2						1		2																																																				
	L																				1																																															
0.1HC	U																														1																							1														
	L																																																																			
0.2AC	U																														1	1																																	2			
	L																															2																																				
0.2BC	U	1	1	1				1	1															1			1	1			2	3				2			2						1	1	1					2						2						2				
	L		1						1	5	5														2							1					3									1				2		1															5	
0.2CC	U		1	1				1	1		1						2							1							1	2					2		2											1		2				5		2										
	L	1	1			1																		1			1				1	5					3							1								1				5		1	2		1							
0.2DC	U		1																								1		4			1																				1																
	L	1	1								1																		1			1					1													1		1				4		1	1									
0.2EC	U															5	3					4					1					2					4													4				1										2				
	L						1															4										1					1													4			2									1		1				
0.2FC	U																								2							2					3													3												1						
	L		1														1					5			2		1					4					5													5				1														
0.2GC	U																																				2													3												1						2
	L																																				3									2				3												1	2					
0.2HC	U																															1					3													2			2												2			
	L																																																				1															
0.3AC	U				1										1																1												1			1																1						
	L																								3			2																																		1						
0.3BC	U						1																																												1		3		2		3											
	L																																																				1									1						
0.3CC	U	1	1				1	3	1								4		1						4		1												3						1						2								1	4			4					
	L							1			1						1	1																																	1																	
0.3DC	U																																													2																			2			
	L																																																																			
0.3EC	U		1					1	1					4				2	1					1			1				1								3					1			1				2		1				5	2			3					5		
	L													1																							1																1		2		4											
0.3FC	U											5		1		4						4			5							1					4			5			3							3					3													
	L		1						1			4		2																																									5			3							5			
0.3GC	U																														1		3																						3		4											
	L	2	4	4			3	4	5		1						2	5	2				3	5	3	5	1			5	2	1				4			4		5		1	2	5	2	3		4		5	4						4	2	5	1			5				
0.3HC	U																																				3			4															3		3											
	L										2																		1		3																										3											
0.4AC	U										3																													1																						1						
	L													1																																																1						4
0.4BC	U										1																																																			1						
	L												3		4																																															1						
0.4CC	U																																																																			
	L				3									1																																																1						
0.4DC	U													1																																																1						
	L				3								2		1																																															1						
0.4EC	U												2		3																																															1						
	L		1						1		1			1										1																														1											4			
0.4FC	U				1																																																									1						
	L																																																													1						

Appendix 3C.--Continued

Sample number		ELEMENTS																																																		MINERALS																
													T-	O-	C-																																											T-		K-								
		Si	Al	Fe	Mg	Ca	Na	K	Ti	P	F	S	C	C	C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	Li	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	Cl	Co	Ta	Cl	Q	Sp	Ca	Do	He	Go	An	Hb	Ap	Py
04GC	U					1	1							1															2																																							
	L	1																																																									2									
04HC	U				1																																																									1						
	L																	1																																												1						
05AC	U	1																										1					3																										1									
	L					1																						1																										1														
05BC	U																																																																			
	L																								2			1																																		1						
05CC	U												1		1																																															1						
	L																																										2																			1						
05DC	U																																										1																									
	L										2																																																			1						
05EC	U												1		1																															1																						
	L													1											2																																											
05FC	U																																							2																						1						
	L																																										2																									
05GC	U																																																																			
	L																									3		1									3		1																													
05HC	U																																													3																1						
	L					1												4																																																		
06AC	U																																																																			
	L													3																																								1	2							1						
06BC	U				1																																																				2					1						
	L																																																													1						
06CC	U				3								4		4																																															1						
	L																											1																		1																						
06DC	U																											1																																		1						
	L													1										1	2											2										1					1																	
06EC	U												2		2													1					2																																			
	L																																																																			
06FC	U																																																																			
	L						3																																																													
06GC	U																											3																																		1						
	L				1																							1																																		1						
06HC	U				3																							1																																		1						
	L				3										1													1																																		1						
07AC	U	3	5	2			4	4	3		4			3				4	3				3	4	3	4	1				3					1			3			1			3	2	2	5	4		4	3	5	3	4			4	3	5	1							
	L	3	3	2			5	3	3		1			1				2	3				3	3	2	4	2				3					2	1		5					1	3	2	3	3	4		3	3	4		4			3	3	5	1							
07BC	U	4	3	2			4	4			2			3				2	3				3	3	3	4	2				3		2			3			5				1		4	4	5	5	5	1	2	5						5	3	2								
	L					3								1					2														2			1								1		5	4			1									1		3							
07CC	U		2	1		2		1						1					2					1			1					1				2			1					4			1	3	3			2						2			3							
	L	2	1			1								5					1					1									2											3	1							1									1							
07DC	U		2			2		1	2					2					4					2							1								1				3	3	1		1				2	1	4					1		2	2							
	L					3					2								3										1													1																			2							
07EC	U	1	2	1		2		1						3										1			1		1			1							3					5								3						2			2							
	L	2												2			5											3												1																			2									
07FC	U	1															3											3																		1													1									
	L	1																										4																						2									1									
07GC	U																		3									4																1																								
	L					1			1								3		3					2				5														3		4			1														3							
07HC	U	1	1	1		2								2					4					2		3		1	1		1	1							1					4			1	3				2							1		2							
	L					4		1	2										5									3																3			2														5							
08AC	U												1		2			1																																												1						
	L																								2							1	1				1					1	1		1																	1						
08BC	U										3																5					1																														1		1				
	L				1													1					5		2							1				1																										1						
08CC	U																																																						2													
	L																																																													1						
08DC	U																																1																													1		1				
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Appendix 3C.--Continued

Sample number		ELEMENTS																																																		MINERALS																
												T-	O-	C-																																											T-		K-								
		Si	Al	Fe	Mg	Ca	Na	K	Ti	P	F	S	C	C	C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	Li	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	Cl	Co	Ta	Cl	Q	Sp	Ca	Do	He	Go	An	Hb	Ap	Py
08EC	U	3	3	1				3	2									1	2					2		2	1				1					3			2					1	2	1	3			1	4	2		4				2	3	4	1				5			
	L	2	1	1		1		2	2									1	2					2	2		1	1								4			1					2	2		5			1	3	2		2				2	2	2	1			2				
08FC	U	4	3	3				3	3		1						1	2	2				3	3	2	4	3	3			4	1				4			2	1		1			2		3	3	4		3	3		4				3	4	2				3				
	L	5	2	1				3	3					1				2	2					2	2	3	3		1		4					4			2	1		1			2	3	4	3	4		5	1		3				1	5	4	1							
08GC	U	3	4	3				3	4					5				4	2				5	5	2	4	2	1			4	1				5			3		5		2	3	3		3		4	1	3	4		5	3			4	2	2	1							
	L	2	2	1		1		1	1					3										2								1								2				2			1				2	1		3				1	2	2	2							
08HC	U	1	2	2		2		2	2		1			2										2							3					2			1					4	1						1	2	4	2	2			2	1	1	2			2				
	L			1							3						1															1																																1				
09AC	U				3																																																								1						
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09BC	U																																												1							2											2			
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09GC	U				1								1		1																											1																	1		1						4
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09HC	U																																																								1								
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10AC	U																																																		1															
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10BC	U				1								1		2																																														1						
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10CC	U												2		2						1																															1									1						
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10GC	U																												2																							1		1		2											
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10HC	U					3																																				5	1																			4					
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11AC	U												2		1						4																			1		2																				1						
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11BC	U												1				1										2																1											1									1						
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11DC	U																										1																		2								1													
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	L																																																												1						
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11GC	U																																																										1						
	L				1																																																						1						
11HC	U																				1																			1												1															
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12AC	U		1			1		1	1		2						1							2							3					2			1					1	1							3		3			1			1							
	L																										4																1												1	2		3											
12BC	U					4																										1											4			3															2							
	L																				5																			3			3												1					1		1						

Appendix 3C.--Continued

Sample number		ELEMENTS																																																		MINERALS																
													T-	O-	C-																																											T-		K-								
		Si	Al	Fe	Mg	Ca	Na	K	Ti	P	F	S	C	C	C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	Li	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	Cl	Co	Ta	Cl	Q	Sp	Ca	Do	He	Go	An	Hb	Ap	Py
12CC	U												1		1																																						1									1						
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12DC	U																				2																																									1						
	L																				2																					4																				1						
13AC	U		1	3													2							1							1	2										1					1						3	3				1						3				
	L		1	2													1														1	2										4			4									2										2				
13BC	U			1																							3					1											2							1				2										3				
	L		1	3													2							1								2				2											1			1				2										3	4			
13CC	U	1	1	4				2	1								2		1					1			2	1			1	2							3						2		1					1							1	3			4	5				
	L	2	1	5				2	2								2		1					1		3	4					2				2			1						2	1	2					1						1	2	4			5	5				
13DC	U		1	2			2										4							1			1	2	4			2				2								1			2					1												3				
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13EC	U						2																																														1											1				
	L																																																				1	2										1	2			
14AC	U				1										1																																															1						
	L														1														2			1																					1	1								1			2			
14BC	U																	1											1			1																					1												2			
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14CC	U																	1	1																	2																			1													
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14DC	U																												2			1																		2				1								1		1				
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14EC	U												4		4			2													1																			1					2							1						
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14HC	U		1					1										1			1											1																												2								
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20AC	U										1										1																																									1						
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21AC	U																																																													1						
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21CC	U				4						1																						5																																2			
	L																																							1				1																								
22AC	U		1	1					1																				4			1										1										1												3				
	L																																										1																									
22CC	U																														1																															1						
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23AC	U										1																																																			1						
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23CC	U				3																						4																1																			5						
	L																2																										2																			1						
24AC	U																																												1																	1						
	L						1											1																																																		
24CC	U				1								1		1																																															1						
	L																																																																			
25AC	U				1																												5																													1						
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25CC	U				1								2		2																														1									1								1						
	L													1																																														1					1			
26AC	U					1					3																																																									
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26CC	U																				1												2						1																		1			1		1						
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Appendix 3C.--Continued

Sample number		ELEMENTS																																																		MINERALS																
													T-	O-	C-																																											T-		K-								
		Si	Al	Fe	Mg	Ca	Na	K	Ti	P	F	S	C	C	C	Ag	As	B	Ba	Be	Br	Cd	Co	Cr	Cu	Ga	Ge	Hg	I	La	Li	Mn	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sn	Sr	Th	U	V	Y	Yb	Zn	Zr	I	X	K	Cl	Co	Ta	Cl	Q	Sp	Ca	Do	He	Go	An	Hb	Ap	Py
28AC	U																											3	3															1	1																							
	L										4																	2																																								
28CC	U																																1																				1				2					1						
	L												4		3													2																																		1						
29AC	U						1																										1																																			
	L																																2																													1						
29CC	U												5		5																														2																	1						
	L		1																																								1		1																							
30AC	U		1			1																																																							1							
	L																																																																		
30CC	U						1														4			2																		3											1		2													
	L												1		1																																						1									1						
31AC	U	1	1								1																																									1							1									
	L		1			2		1	1		3													2	2				3		5					2			2				4	1			1				1	1	1	3				1			2							
31CC	U																																									3													2									1				
	L																				1																																									1		1				
32AC	U																				3											1							1																									1				
	L																				1							1																																				2				
32CC	U																																																	1					1													
	L			1														1														1													1					1														2				