

REPORT OF
ANALYTICAL EVALUATION PROGRAM
STANDARD REFERENCE WATER SAMPLES NUMBERS 24 AND 25

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
Denver, Colorado
February 1968

STANDARD REFERENCE WATER SAMPLES NUMBERS 24 AND 25

PURPOSE AND PLAN

As a means of providing an independent and objective evaluation of the water quality data published by the U. S. Geological Survey and other cooperating laboratories, standard reference water samples are prepared and distributed at regular intervals. This report summarizes the analytical results submitted by 31 laboratories for Standard Reference Water Samples numbers 24 and 25 distributed on November 27, 1967.

The "Instructions for Analysis and Reporting Results" specified only that the pH and/or alkalinity determinations be performed first. No other required order of performing the determinations, nor restriction on methods and equipment was given. It is only by allowing this freedom of choice by each laboratory to treat these samples in the manner accorded its routine samples, that a reasonably accurate evaluation of laboratory performance can be obtained. This program operates as a quality control tool to enable each laboratory to detect any areas of deficiency. Participating laboratories are identified in this report by a preassigned code number for the purpose of keeping information on performance confidential.

PREPARATION OF SAMPLES

Approximately 150 gallons of each sample was collected and filtered through a 0.45µ membrane filter into a large polyethylene drum. Sample No. 25 was acidified to a pH of about 1.7 with nitric acid and then 18 minor elements were added. Each sample was mixed overnight with a motor-driven stirrer, pumped through an ultraviolet (2537A) sterilizer and packaged in sterile Teflon bottles under ultraviolet radiation.

DETERMINATIONS

The following determinations were requested in duplicate:

<u>Sample No. 24</u>		<u>Sample No. 25</u>	
SiO ₂ ✓	SO ₄	Al ✓	pH ✓
Ca ✓	Cl ✓	Fe ✓	Cu ✓
Mg ✓	F ✓	Mn ✓	Zn
Na ✓	Sp. Cond.	Li	Sr
K ✓	pH	Total Acidity (H ⁺) ✓	As ✓
HCO ₃ ✓			

PARTICIPATING LABORATORIES

U.S. Geological Survey

Alabama, Tuscaloosa	New York, Albany
Alaska, Anchorage	North Carolina, Raleigh
Arizona, Tucson	Ohio, Columbus
Arkansas, Little Rock	Oklahoma, Oklahoma City
California, Menlo Park	Oregon, Portland
California, Sacramento	Pennsylvania, Philadelphia
Colorado, Denver	Puerto Rico, San Juan
Colorado, Denver (Research)	Texas, Austin
D.C., Washington	Utah, Salt Lake City
Florida, Ocala	Virginia, Charlottesville
Louisiana, Baton Rouge	Washington, Tacoma
Nebraska, Lincoln	Wyoming, Worland
New Mexico, Albuquerque	

Other

2. Arizona, Tucson: Univ. Arizona, Dept. Agr. Chem. & Soils
 1. Colorado, Denver: Board of Water Commissioners, WQ Lab
 1. Kansas, Topeka: State Dept. Health, Sanitary Engineering Lab
 7. North Dakota, Bismarck: State Laboratories Dept.
 1. Ohio, Cincinnati: Federal Water Pollution Control Admin.
 1. Wyoming, Laramie: State Dept. Agriculture

STATISTICAL EVALUATION

A computer was programmed to statistically analyze the data and to establish the most reliable estimate of the true values for the various determinations reported. Mathematical calculations are the same as those used for "Standard Reference Samples Numbers 18 and 19" except for the use of a 95 percent confidence level.

The mean, average deviation, percent deviation from the mean, standard deviation, and total range were calculated for each determination. Confidence limits about the mean were also calculated in order to define the concentration range within which the true value may be expected to fall with a confidence level of 95 percent. Outlying values were rejected on the basis of statistical tests as outlined in ASTM Standards (1964).

REPORTED VALUES

The following section shows the reported value for each determination by each participating laboratory, and a graphical presentation of each reported value and the frequency of its occurrence. A few extreme values are not shown on the scale.

A summary shows the number of laboratories reporting values for each determination and the percentage of values rejected. The percentages of unrejected values falling within the 95 percent confidence interval, within one standard deviation ($\bar{X} \pm \text{STD}$), and within two standard deviations ($\bar{X} \pm 2 \text{ STD}$) are also given.

DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1-79	7.6	7.0	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	2-46	7.2	1.4	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	3-57	7.4	4.2	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	4-45	7.1	0.1	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	5-69	6.6	7.1	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	6-68	7.7	8.4	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
12-67	7-55	7.4	4.2	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	8-67	6.8	4.3	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
12-67	9-78	7.1	0.1	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
12-67	10-49	7.8	9.8	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	11-71	7.2	1.4	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	12-70	5.5	22.6	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
12-67	13-63	7.8	9.8	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	14-47			NOT DETERMINED
1-68	15-48	7.4	4.2	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	16-52	7.2	1.4	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	17-56	7.4	4.2	OTHER
1-68	18-65	7.4	4.2	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
0-0	19-51	7.1	0.1	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	20-64	7.4	4.2	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	21-72	6.4	9.9	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	22-53	7.4	4.2	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
1-68	23-62	7.2	1.4	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
12-67	24-76	6.6	7.1	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
0-0	25-54	7.4	4.2	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
12-67	26-38	7.7	8.4	COLORIMETRIC HETEROPOLY BLUE, APHA STD. METH., 1965
1-68	27-15	5.9	16.9	COLORIMETRIC MOLYBDOUSILICATE, APHA STD. METH., 1965
12-67	28-25	7.2	1.4	MOLYBDATE BLUE, USGS WSP 1454, D'34A-1
0-0	29-5	6.0	15.5	COLORIMETRIC MOLYBDOUSILICATE, APHA STD. METH., 1965
12-67	30-27			NOT DETERMINED
0-0	32-2	10.	40.8	REJECT MOLYBDATE BLUE, USGS WSP 1454, D'34A-1

TOTAL RANGE 5.5
 MEAN 7.1036
 STANDARD DEVIATION 0.5777

10.
 AVERAGE DEVIATION 0.4240
 95 PCT.CONF.INTVL OF MEAN 7.1036 +DR- 0.2240

SAMPLE 24
 S102

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
12-67	1	14 1	9.9	COMPLEXOMETRIC, USGS WSP 1454, D'8A-1
1-68	2	12 6	5.8	ATOMIC ABSORPTION
1-68	3	13	2.0	ATOMIC ABSORPTION
1-68	4	13	2.0	ATOMIC ABSORPTION
1-68	5	13	2.0	ATOMIC ABSORPTION
1-68	6	13	2.0	ATOMIC ABSORPTION
12-67	7	13	2.0	ATOMIC ABSORPTION
1-68	8	13 1	2.0	COMPLEXOMETRIC, USGS WSP 1454, D'8A-1
12-67	9	12 6	5.8	ATOMIC ABSORPTION
12-67	10	13 1	2.0	COMPLEXOMETRIC, USGS WSP 1454, D'8A-1
1-68	11	12 1	5.8	COMPLEXOMETRIC, USGS WSP 1454, D'8A-1
1-68	12	13 6	2.0	ATOMIC ABSORPTION
12-67	13	12 6	5.8	ATOMIC ABSORPTION
1-68	14	12 1	5.8	COMPLEXOMETRIC, USGS WSP 1454, D'8A-1
1-68	15	13 7	2.0	SIMULTANEOUS, JAWWA, V. 56, NO. 1 (1964)
1-68	16	12 6	5.8	ATOMIC ABSORPTION
1-68	17	13 6	2.0	ATOMIC ABSORPTION
1-68	18	12 1	5.8	COMPLEXOMETRIC, USGS WSP 1454, D'8A-1
0-0	19	12 6	5.8	ATOMIC ABSORPTION
1-68	20	13 6	2.0	ATOMIC ABSORPTION
1-68	21	13 1	2.0	COMPLEXOMETRIC, USGS WSP 1454, D'8A-1
1-68	22	13 6	2.0	ATOMIC ABSORPTION
1-68	23	13 1	2.0	COMPLEXOMETRIC, USGS WSP 1454, D'8A-1
12-67	24	13 1	2.0	COMPLEXOMETRIC, USGS WSP 1454, D'8A-1
0-0	25	12 2	5.8	EDTA TITRIMETRIC, APHA STD. METH. 1965
12-67	26	14	9.9	EDTA TITRIMETRIC, APHA STD. METH. 1965
1-68	27	13	2.0	EDTA TITRIMETRIC, APHA STD. METH. 1965
12-67	28	14 20	9.9	OTHER
0-0	29	12 3	5.8	EDTA TITRIMETRIC, APHA STD. METH. 1965
12-67	30	12 3	5.8	EDTA TITRIMETRIC, APHA STD. METH. 1965
0-0	32	13 6	2.0	ATOMIC ABSORPTION

TOTAL RANGE	12	-	14			SAMPLE 24
MEAN		12.7418	AVERAGE DEVIATION	0.5266		
STANDARD DEVIATION		0.6308	95 PCT.CONF.INTVL OF MEAN	12.7418 +OR-	0.2313	CA

DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1	1.7	19.0	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
1-68	2	2.0	4.8	ATOMIC ABSORPTION
1-68	3	2.1	0.0	ATOMIC ABSORPTION
1-68	4	2.0	4.8	ATOMIC ABSORPTION
1-68	5	2.2	4.8	ATOMIC ABSORPTION
1-68	6	2.0	4.8	ATOMIC ABSORPTION
12-67	7	2.0	4.8	ATOMIC ABSORPTION
1-68	8	2.0	4.8	ATOMIC ABSORPTION
12-67	9	2.1	0.0	ATOMIC ABSORPTION
12-67	10	2.1	0.0	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
1-68	11	2.4	14.3	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
1-68	12	2.0	4.8	ATOMIC ABSORPTION
12-67	13	2.1	0.0	ATOMIC ABSORPTION
1-68	14	2.9	38.1	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
1-68	15	2.0	4.8	ATOMIC ABSORPTION
1-68	16	2.0	4.8	ATOMIC ABSORPTION
1-68	17	2.1	0.0	ATOMIC ABSORPTION
1-68	18	2.5	19.0	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
0- 0	19	1.9	9.5	ATOMIC ABSORPTION
1-68	20	2.0	4.8	ATOMIC ABSORPTION
1-68	21	2.0	4.8	ATOMIC ABSORPTION
1-68	22	2.2	4.8	ATOMIC ABSORPTION
1-68	23	1.9	9.5	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
12-67	24	2.4	14.3	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
0- 0	25	2.9	38.1	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
12-67	26	1.6	23.8	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
1-68	27	2.3	9.5	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
12-67	28	1.7	19.0	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
0- 0	29	3.3	57.1	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
12-67	30	1.9	9.5	CALC. BY DIFFERENCE, USGS WSP 1454, D'17A-1, D'23A-1
0- 0	32	2.0	4.8	ATOMIC ABSORPTION

2.19 ± 4.5
2.28 ± 5.2

REJECT

TOTAL RANGE 1.6 - 3.3
 MEAN 2.1000 AVERAGE DEVIATION 0.2000
 STANDARD DEVIATION 0.2924 95 PCT.CONF.INTVL OF MEAN 2.1000 +OR- 0.1092

SAMPLE 24
 MG

DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1	25	2.1	FLAME PHOTOMETRY
1-68	2	25	2.1	ATOMIC ABSORPTION
1-68	3	26	1.8	ATOMIC ABSORPTION
1-68	4	26	1.8	ATOMIC ABSORPTION
1-68	5	25	2.1	ATOMIC ABSORPTION
1-68	6	26	1.8	ATOMIC ABSORPTION
12-67	7	25	2.1	ATOMIC ABSORPTION
1-68	8	26	1.8	ATOMIC ABSORPTION
12-67	9	26	1.8	ATOMIC ABSORPTION
12-67	10			NOT DETERMINED
1-68	11			NOT DETERMINED
1-68	12	25	2.1	ATOMIC ABSORPTION
12-67	13	26	1.8	ATOMIC ABSORPTION
1-68	14			NOT DETERMINED
1-68	15	27	5.7	FLAME PHOTOMETRY
1-68	16	25	2.1	ATOMIC ABSORPTION
1-68	17	25	2.1	FLAME PHOTOMETRY
1-68	18	26	1.8	FLAME PHOTOMETRY
0-0	19	25	2.1	ATOMIC ABSORPTION
1-68	20	25	2.1	FLAME PHOTOMETRY
1-68	21	25	2.1	ATOMIC ABSORPTION
1-68	22	26	1.8	ATOMIC ABSORPTION
1-68	23	26	1.8	ATOMIC ABSORPTION
12-67	24	26	1.8	FLAME PHOTOMETRY
0-0	25	22	13.9	REJECT OTHER
12-67	26	25	2.1	FLAME PHOTOMETRY
1-68	27	25	2.1	FLAME PHOTOMETRY
12-67	28	26	1.8	FLAME PHOTOMETRY
0-0	29			NOT DETERMINED
12-67	30	19	25.6	REJECT FLAME PHOTOMETRY
0-0	32	23	10.0	REJECT ATOMIC ABSORPTION

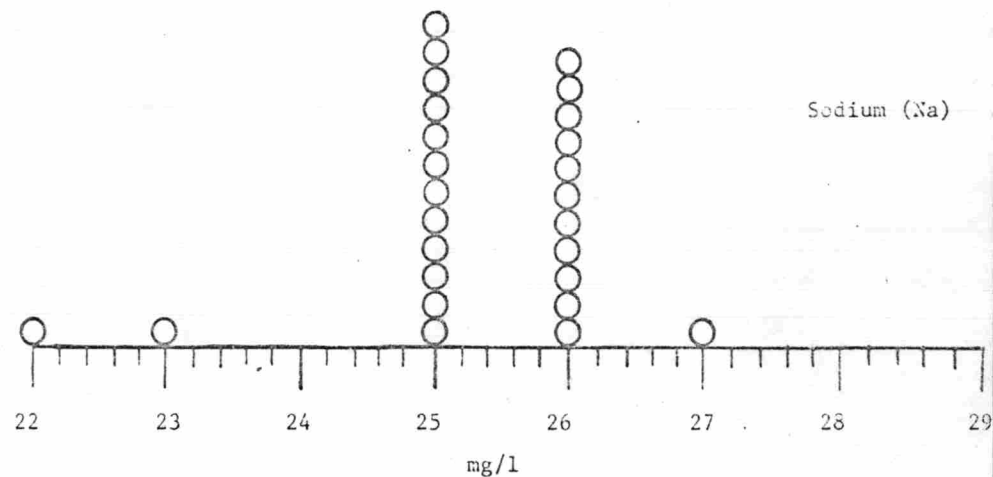
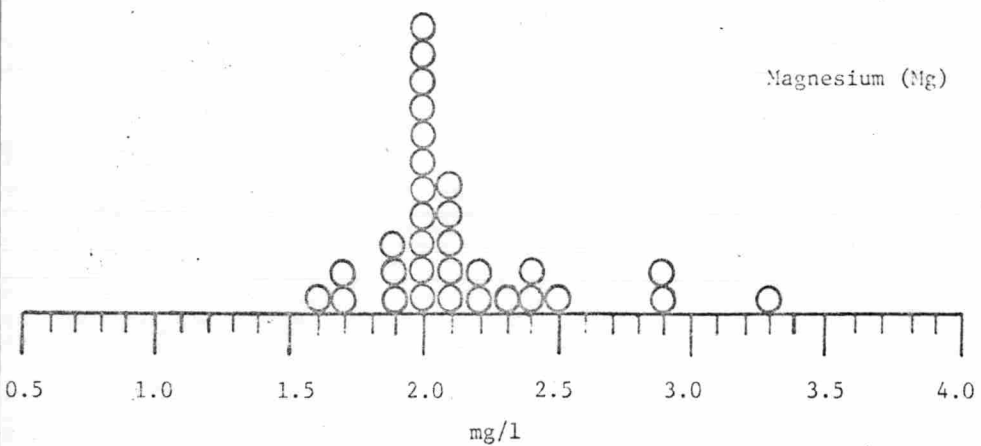
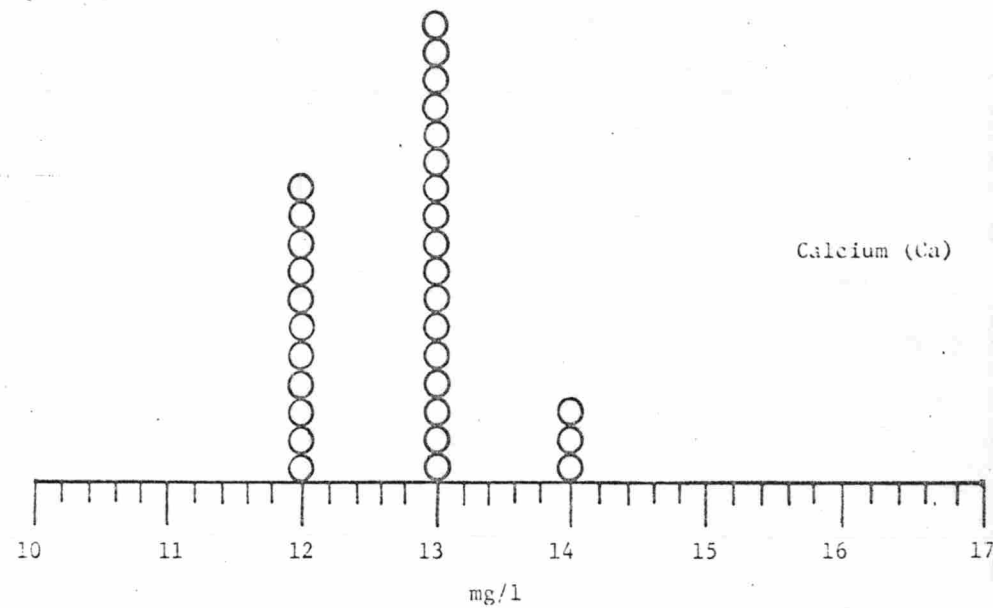
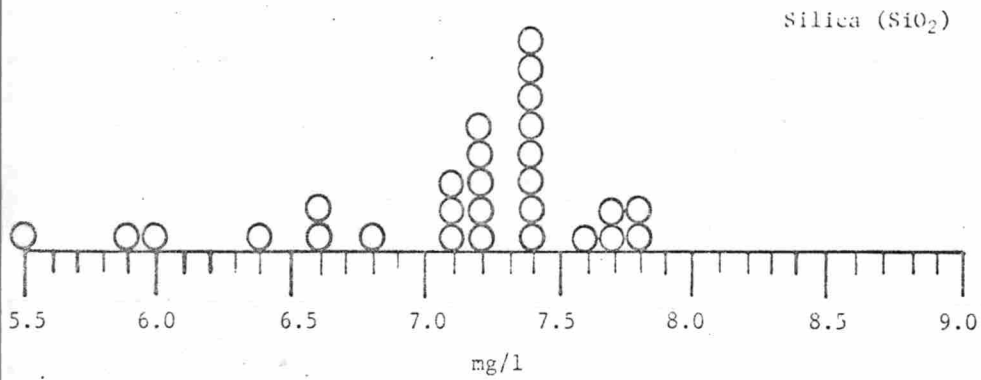
TOTAL RANGE 19
 MEAN 25.5415
 STANDARD DEVIATION 0.5882

- 27
 25.5415
 0.5882

AVERAGE DEVIATION 0.5417
 95 PCT. CONF. INTVL OF MEAN 25.5415 +OR- 0.2484

SAMPLE 24

NA



SAMPLE NO. 24

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
12-67	1	0.6	25.0	FLAME PHOTOMETRY
1-68	2	0.4	50.0	ATOMIC ABSORPTION
1-68	3	1.0	25.0	ATOMIC ABSORPTION
1-68	4	0.9	12.5	ATOMIC ABSORPTION
1-68	5	0.8	0.0	ATOMIC ABSORPTION
1-68	6	0.9	12.5	ATOMIC ABSORPTION
12-67	7	0.7	12.5	ATOMIC ABSORPTION
1-68	8	0.8	0.0	ATOMIC ABSORPTION
12-67	9	0.8	0.0	ATOMIC ABSORPTION
12-67	10			NOT DETERMINED
1-68	11			NOT DETERMINED
1-68	12	0.9	12.5	ATOMIC ABSORPTION
12-67	13	0.9	12.5	ATOMIC ABSORPTION
1-68	14			NOT DETERMINED
1-68	15	0.7	12.5	FLAME PHOTOMETRY
1-68	16	0.8	0.0	ATOMIC ABSORPTION
1-68	17	0.8	0.0	FLAME PHOTOMETRY
1-68	18	0.9	12.5	FLAME PHOTOMETRY
0-0	19	1.0	25.0	ATOMIC ABSORPTION
1-68	20	0.8	0.0	FLAME PHOTOMETRY
1-68	21	0.6	25.0	ATOMIC ABSORPTION
1-68	22	0.7	12.5	ATOMIC ABSORPTION
1-68	23	0.7	12.5	ATOMIC ABSORPTION
12-67	24	0.8	0.0	FLAME PHOTOMETRY
0-0	25			NOT DETERMINED
12-67	26	0.7	12.5	FLAME PHOTOMETRY
1-68	27	0.9	12.5	FLAME PHOTOMETRY
12-67	28	0.7	12.5	FLAME PHOTOMETRY
0-0	29			NOT DETERMINED
12-67	30	2.0	150.0	REJECT FLAME PHOTOMETRY
0-0	32	0.8	0.0	ATOMIC ABSORPTION

TOTAL RANGE 0.4
 MEAN 0.8000
 STANDARD DEVIATION 0.1103

- 2.0
 AVERAGE DEVIATION
 95 PCT.CONF.INTVL OF MEAN

0.0833
 0.8000 +0R- 0.0466

SAMPLE 24

K

DATE MO-YR CODE REFERRED VALUE PCI DEF. FROM MEAN METHOD

12-67	1	36	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	2	36	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	3	34	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	4	35	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	5	35	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	6	34	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
12-67	7	34	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	8	34	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
12-67	9	35	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
12-67	10	36	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	11	37	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	12	33	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
12-67	13	35	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	14	35	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	15	32	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	16	35	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	17	34	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	18	35	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
0-0	19	34	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	20	34	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	21	35	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	22	35	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	23	34	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
12-67	24	36	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
0-0	25	35	INDICATOR METHOD, ALPHA STD. METH., 1965
12-67	26	34	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
1-68	27	36	POTENTIOMETRIC, USGS WSP 1454, D'2A-1
12-67	28	36	OTHER
0-0	29	280	INDICATOR METHOD, ALPHA STD. METH., 1965
12-67	30	24	INDICATOR METHOD, ALPHA STD. METH., 1965
0-0	32	32	INDICATOR METHOD, ALPHA STD. METH., 1965

TOTAL RANGE 24
 MEAN 34.6895
 STANDARD DEVIATION 1.1681

AVERAGE DEVIATION 0.9156
 95 PCT.CONF.INVL OF MEAN 34.6895 +0K-

REJECT REJECT

SAMPLE 24 HCO3 0.4442

DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1	30	2.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	2	28	4.7	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	3	28	4.7	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	4	30	2.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	5	30	2.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	6	32	9.0	VISUAL THORIN, USGS WSP 1454, D#38A-1
12-67	7	28	4.7	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	8	30	2.2	VISUAL THORIN, USGS WSP 1454, D#38A-1
12-67	9	29	1.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
12-67	10	30	2.2	VISUAL THORIN, USGS WSP 1454, D#38A-1
1-68	11	28	4.7	UTHER
1-68	12	30	2.2	VISUAL THORIN, USGS WSP 1454, D#38A-1
12-67	13	30	2.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	14	22	25.1	REJECT
1-68	15	32	9.0	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	16	30	2.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	17	30	2.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	18	31	5.6	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
0-0	19	28	4.7	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	20	28	4.7	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	21	30	2.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	22	28	4.7	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	23	30	2.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
12-67	24	29	1.2	VISUAL THORIN, USGS WSP 1454, D#38A-1
0-0	25	29	1.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
12-67	26	30	2.2	SPECTROPHOTOMETRIC THORIN, USGS WSP 1454, D#38A-2
1-68	27	26	11.5	GRAVIMETRIC WITH IGNITION, APHA STD. METH., 1965
12-67	28	32	9.0	UTHER
0-0	29	31	5.6	TURBIDIMETRIC, APHA STD. METH., 1965
12-67	30	26	11.5	UTHER
0-0	32	28	4.7	VISUAL THORIN, USGS WSP 1454, D#38A-1

TOTAL RANGE 22
 MEAN 29.3665
 STANDARD DEVIATION 1.5421

32
 AVERAGE DEVIATION 1.2511
 95 PCT. CONF. INTVL OF MEAN 29.3665 ±0.5758

SAMPLE 24

S04

DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1	26 ⁷	3.8	PROPOSED VISUAL MERCURIMETRIC (JUNE 1963)
1-68	2	28 ⁸	3.6	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	3	27 ⁷	0.1	PROPOSED VISUAL MERCURIMETRIC (JUNE 1963)
1-68	4	27 ⁸	0.1	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	5	28 ⁸	3.6	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	6	28 ⁸	3.6	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
12-67	7	26 ⁷	3.8	PROPOSED SPECTROPHOTOMETRIC MERCURIMETRIC (JUNE 1963)
1-68	8	28 ⁸	3.6	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
12-67	9	25 ⁹	7.5	PROPOSED SPECTROPHOTOMETRIC MERCURIMETRIC (JUNE 1963)
12-67	10	26 ⁸	3.8	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	11	27 ⁸	0.1	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	12	26 ⁷	3.8	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
12-67	13	25 ⁷	3.8	PROPOSED VISUAL MERCURIMETRIC (JUNE 1963)
1-68	14	28 ⁸	3.6	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	15	26 ⁸	3.8	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	16	27	0.1	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	17	27	0.1	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	18	28	3.8	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
0-0	19	27	0.1	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	20	28	3.6	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
1-68	21	26 ⁷	3.8	PROPOSED VISUAL MERCURIMETRIC (JUNE 1963)
1-68	22	27 ⁹	0.1	PROPOSED SPECTROPHOTOMETRIC MERCURIMETRIC (JUNE 1963)
1-68	23	26 ⁹	3.8	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
12-67	24	29 ⁹	7.3	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
0-0	25	28	3.6	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1
12-67	26	26 ⁷	3.8	PROPOSED VISUAL MERCURIMETRIC (JUNE 1963)
1-68	27	27 ¹⁰	0.1	ARGENTOMETRIC, APHA STD. METH., 1965
12-67	28	27 ¹⁰	0.1	DIFER
0-0	29	28 ⁷	3.6	PROPOSED VISUAL MERCURIMETRIC (JUNE 1963)
12-67	30	31 ¹¹	14.7	TECHNICAL AUTO ANALYZER
0-0	32	30 ⁹	11.0	MUHR VOLUMETRIC, USGS WSP 1454, D'10A-1

REJECT

26

TOTAL RANGE 25
MEAN
STANDARD DEVIATION

- 31
27.0332
1.0981

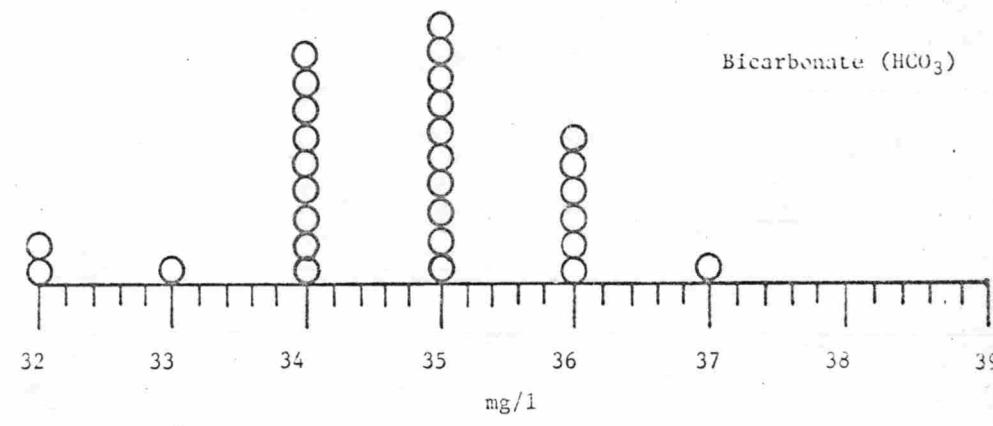
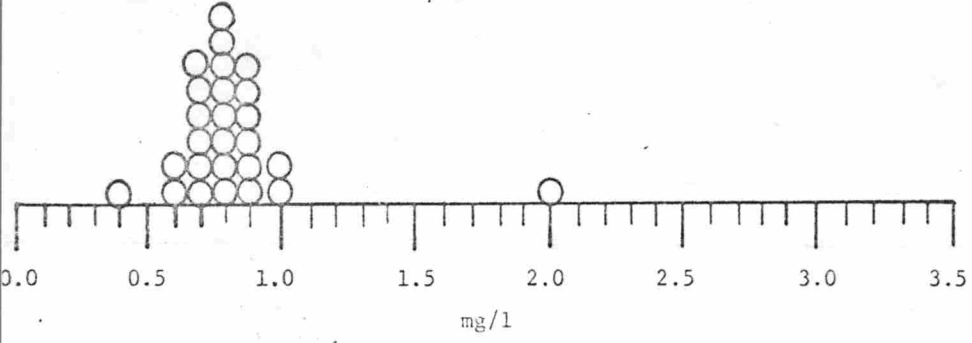
AVERAGE DEVIATION
95 PCT.CONF.INTVL OF MEAN

0.8444
27.0332 +OR- 0.4100

SAMPLE 24
CL

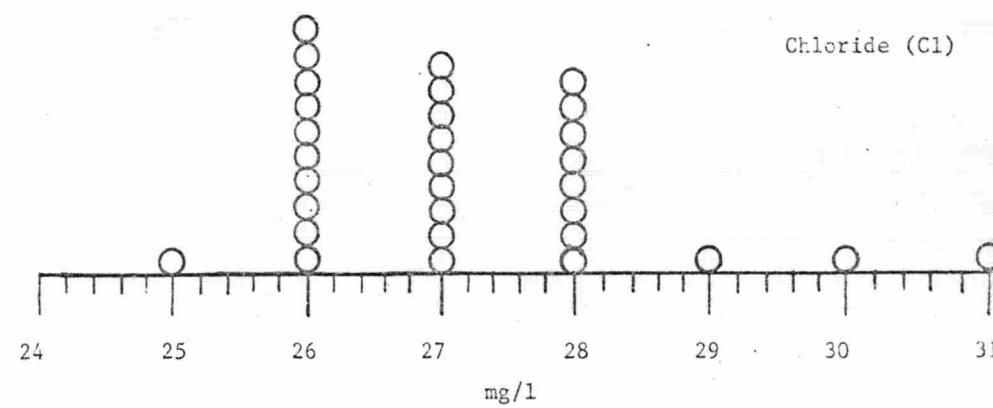
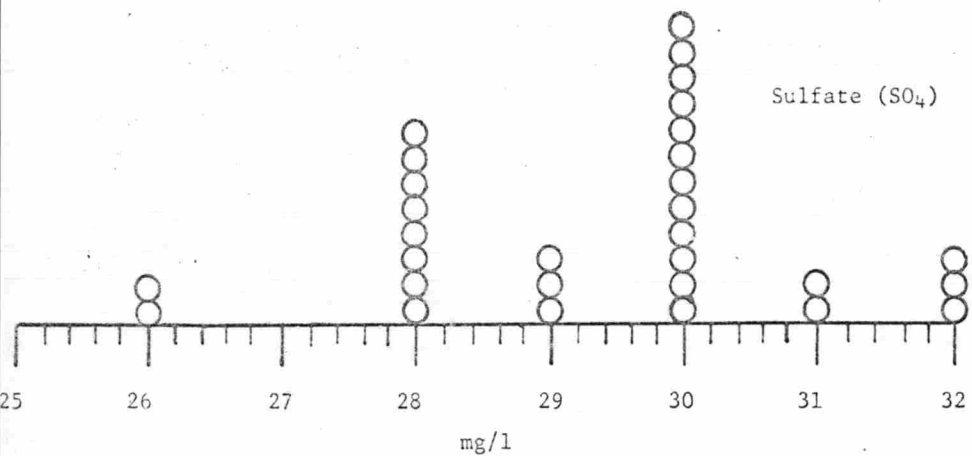
Potassium (K)

Bicarbonate (HCO_3)



Sulfate (SO_4)

Chloride (Cl)



SAMPLE NO. 24

DATE MU-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
12-67	1	0.4	39.3	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	2	0.4	39.3	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	3	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	4	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	5	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	6	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
12-67	7	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	8	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
12-67	9	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
12-67	10	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	11	0.2	30.3	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	12	0.3	4.5	OTHER
12-67	13	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	14	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	15	0.2	30.3	ZIRCONIUM-ALIZARIN, USGS WSP 1454, D'16A-2
1-68	16	0.2	30.3	OTHER
1-68	17	0.3	4.5	SPADNS METHOD, APHA STD. METH., 1965
1-68	18	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
0-0	19	0.2	30.3	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	20	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	21	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	22	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
1-68	23	0.3	4.5	ZIRCONIUM-ERIOCHROME CYANINE R, USGS WSP 1454, D'16A-1
12-67	24	0.3	4.5	SPADNS METHOD, APHA STD. METH., 1965
0-0	25	0.2	30.3	OTHER
12-67	26	0.3	4.5	SPADNS METHOD, APHA STD. METH., 1965
1-68	27	0.3	4.5	VISUAL ALIZARIN, APHA STD. METH., 1965
12-67	28	0.2	30.3	SPADNS METHOD, APHA STD. METH., 1965
0-0	29	0.2	30.3	SPADNS METHOD, APHA STD. METH., 1965
12-67	30	0.3	4.5	OTHER
0-0	32	0.4	39.3	ZIRCONIUM-ALIZARIN, USGS WSP 1454, D'16A-2

TOTAL RANGE 0.2
 MEAN 0.2871
 STANDARD DEVIATION 0.0562

- 0.4
 AVERAGE DEVIATION 0.0393
 95 PCT.CONF.INTVL OF MEAN 0.2871 +OR- 0.0206

SAMPLE 24

F

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
12-67	1			NOT DETERMINED
1-68	2	214 1	1.0	WHEATSTONE BRIDGE
1-68	3	218 2	0.8	DIRECT READING INSTRUMENTS
1-68	4	218 1	0.8	WHEATSTONE BRIDGE
1-68	5	219	1.3	WHEATSTONE BRIDGE
1-68	6	218	0.8	WHEATSTONE BRIDGE
12-67	7	217	0.4	WHEATSTONE BRIDGE
1-68	8	218	0.8	WHEATSTONE BRIDGE
12-67	9	217	0.4	WHEATSTONE BRIDGE
12-67	10	219	1.3	WHEATSTONE BRIDGE
1-68	11	221	2.2	WHEATSTONE BRIDGE
1-68	12	217	0.4	WHEATSTONE BRIDGE
12-67	13	215	0.6	WHEATSTONE BRIDGE
1-68	14	228	5.5	WHEATSTONE BRIDGE
1-68	15	216	0.1	WHEATSTONE BRIDGE
1-68	16	219	1.3	WHEATSTONE BRIDGE
1-68	17	212	1.9	WHEATSTONE BRIDGE
1-68	18	218	0.8	WHEATSTONE BRIDGE
0-0	19	220 ✓	1.8	WHEATSTONE BRIDGE
1-68	20	201 2	7.0	DIRECT READING INSTRUMENTS
1-68	21	216 1	0.1	WHEATSTONE BRIDGE
1-68	22	218 ↓	0.8	WHEATSTONE BRIDGE
1-68	23	217 ↓	0.4	WHEATSTONE BRIDGE
12-67	24	208 2	3.8	DIRECT READING INSTRUMENTS
0-0	25	219 1	1.3	WHEATSTONE BRIDGE
12-67	26	220 20	1.8	OTHER
1-68	27	221 2	2.2	DIRECT READING INSTRUMENTS
12-67	28	222 20	2.7	OTHER
0-0	29	215 1	0.6	WHEATSTONE BRIDGE
12-67	30	205 1	5.2	WHEATSTONE BRIDGE
0-0	32	200 ✓	7.5	DIRECT READING INSTRUMENTS

TOTAL RANGE 200 - 228
 MEAN 216.1983
 STANDARD DEVIATION 5.9097

AVERAGE DEVIATION 4.0006
 95 PCT.CONF.INTVL OF MEAN 216.1983 +OR- 2.2065

SAMPLF 24

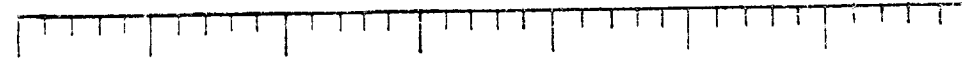
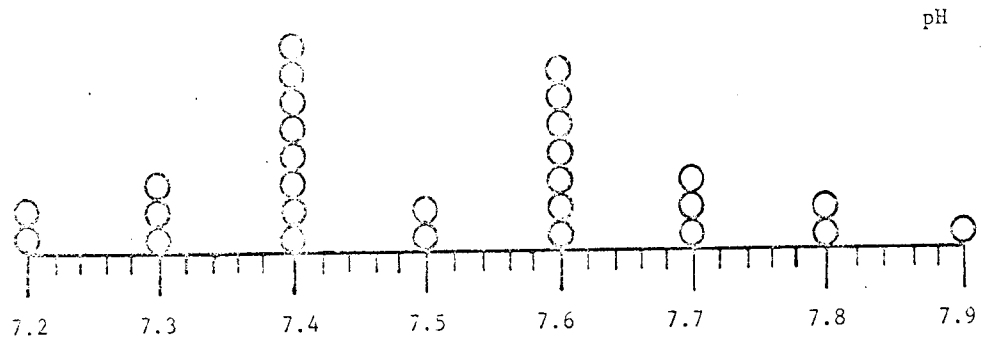
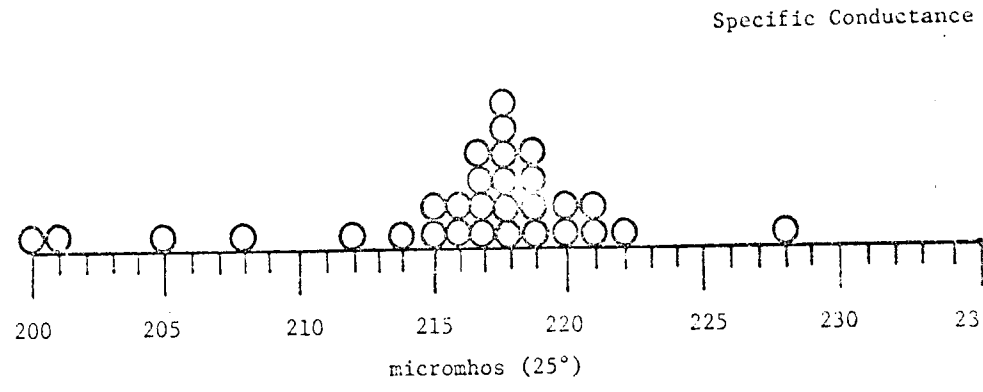
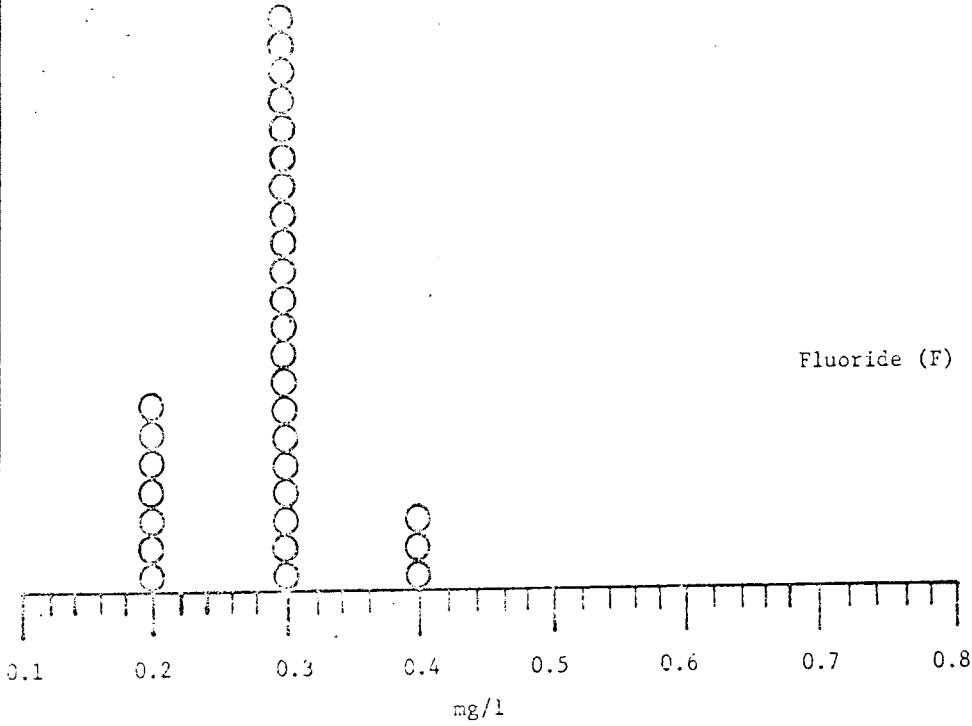
SP.COND

DATE MU-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1	7.6	1.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	2	7.4	1.3	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	3	7.4	1.3	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	4	7.6	1.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	5	7.7	2.7	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	6	7.4	1.3	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	7	7.8	4.0	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	8	7.6	1.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	9	7.5	0.0	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	10	7.4	1.3	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	11	7.7	2.7	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	12	7.3	2.6	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	13	7.4	1.3	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	14	7.3	2.6	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	15	7.0	6.6	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	16	7.7	2.7	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	17	7.6	1.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	18	7.5	0.0	INSTRUMENT METHOD, (POTENTIOMETRIC)
0-0	19	7.6	1.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	20	7.3	2.6	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	21	7.2	4.0	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	22	7.8	4.0	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	23	7.2	4.0	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	24	7.6	1.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
0-0	25	8.0	6.7	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	26	7.6	1.4	OTHER
1-68	27	7.1	5.3	OTHER
12-67	28	7.4	1.3	INSTRUMENT METHOD, (POTENTIOMETRIC)
0-0	29	7.4	1.3	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	30	7.4	1.3	INSTRUMENT METHOD, (POTENTIOMETRIC)
0-0	32	7.9	5.4	INSTRUMENT METHOD, (POTENTIOMETRIC)

TOTAL RANGE 7.0
 MEAN 7.4968
 STANDARD DEVIATION 0.2287

AVERAGE DEVIATION 8.0
 95 PCT. CONF. INTVL OF MEAN 0.1840
 PH 7.4968 +0.0839

SAMPLE 24



SAMPLE NO. 24

DETERMINATION	NO. LABS REPORTING	PCT. OF VALUES REJECTED	PCT. OF UNREJECTED VALUES WITHIN		
			95 PCT. CI	X +OR- STD	X +OR- 2STD
SI02	29	3	29	71	93
CA	31	0	0	55	100
MG	31	3	60	73	93
NA	27	11	0	96	96
K	26	8	33	83	100
HC03	31	6	34	66	93
SI04	31	3	10	77	93
CL	31	3	30	90	97
F	31	0	66	68	90
SP. COND	30	0	50	83	93
PH	31	0	6	74	94

DATE MU-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
12-67	1			NOT DETERMINED
1-68	2	0.6 ↓	11.1	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
1-68	3	0.6 ↓	11.1	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
1-68	4	0.6 ↓	11.1	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
1-68	5	0.6 ↓	11.1	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
1-68	6			NOT DETERMINED
12-67	7	0.5 6	7.4	ERIOCHROME CYANINE RC
1-68	8	0.5 ↓	7.4	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
12-67	9	0.6 ↓	11.1	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
12-67	10			NOT DETERMINED
1-68	11	1.1 ↓	103.7	REJECT FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
1-68	12	0.4 ↓	25.9	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
12-67	13	0.5 ↓	7.4	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
1-68	14			NOT DETERMINED
1-68	15			NOT DETERMINED
1-68	16	0.6 2	11.1	OTHER
1-68	17	0.6 ↓	11.1	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
1-68	18	0.8 7	48.1	REJECT ALUMINON, ALPHA STD. METH., 1965
0-0	19	0.5 ↓	7.4	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
1-68	20	0.5 ↓	7.4	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
1-68	21			NOT DETERMINED
1-68	22			NOT DETERMINED
1-68	23	0.5 ↓	7.4	FERRON-ORTHOPHENANTHROLINE, USGS WSP 1454, D#3A-1
12-67	24			NOT DETERMINED
0-0	25			NOT DETERMINED
1-68	27			NOT DETERMINED
0-0	29	0.1 6	81.5	REJECT ERIOCHROME CYANINE RC
12-67	30	0.5 20	7.4	OTHER
0-0	32			NOT DETERMINED

TOTAL RANGE	0.1	-	1.1			SAMPLE 25
MEAN	0.5400		AVERAGE DEVIATION	0.0560		
STANDARD DEVIATION	0.0632		95 PCT.CONF.INTVL OF MEAN	0.5400 +OR-	0.0350	AL

DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN		METHOD	
12-67	1	0.39 ²	1.7		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	2	0.33 ⁸	16.8	REJECT	FERRON-ORTHO PHENANTHROLINE, USGS WSP 1454, D#3A-1	33
1-68	3	0.42 ²	5.9		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	4	0.39 ²	1.7		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	5	0.39 ⁸	1.7		FERRON-ORTHO PHENANTHROLINE, USGS WSP 1454, D#3A-1	39 ✓
1-68	6	0.41 ²	3.4		BIPYRIDINE, USGS WSP 1454, D#19A-1	
12-67	7	0.41 ⁹	3.4	✓	ATOMIC ABSORPTION	
1-68	8	0.38 ²	4.2		BIPYRIDINE, USGS WSP 1454, D#19A-1	41 ✓
12-67	9	0.41 ⁸	3.4		FERRON-ORTHO PHENANTHROLINE, USGS WSP 1454, D#3A-1	
12-67	10	0.39 ²	1.7		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	11	1.0 ⁸	152.1	REJECT	FERRON-ORTHO PHENANTHROLINE, USGS WSP 1454, D#3A-1	
1-68	12	0.39 ²	1.7		BIPYRIDINE, USGS WSP 1454, D#19A-1	
12-67	13	0.40 ¹	0.8		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	14	0.36 ¹	9.2		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	15	0.44 ¹	10.9		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	16	0.36 ²⁰	9.2		OTHER	
1-68	17	0.41 ²	3.4		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	18	0.40 ¹	0.8		BIPYRIDINE, USGS WSP 1454, D#19A-1	
0-0	19	0.40 ¹	0.8		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	20	0.40 ¹	0.8		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	21	0.40 ¹	0.8		BIPYRIDINE, USGS WSP 1454, D#19A-1	
1-68	22	0.36 ⁹	9.2	✓	ATOMIC ABSORPTION	
1-68	23	0.41 ²	3.4		BIPYRIDINE, USGS WSP 1454, D#19A-1	
12-67	24	0.62 ¹	56.3	REJECT	BIPYRIDINE, USGS WSP 1454, D#19A-1	
0-0	25	0.40 ¹	0.8		BIPYRIDINE, USGS WSP 1454, D#19A-1	40
1-68	27	0.40 ³	0.8		PHENANTHROLINE, APHA STD. METH., 1965	
0-0	29	0.18 ³	54.6	REJECT	PHENANTHROLINE, APHA STD. METH., 1965	
12-67	30	0.68 ²⁰	71.4	REJECT	OTHER	
0-0	32	0.40 ⁹	0.8	✓	ATOMIC ABSORPTION	

TOTAL RANGE 0.18 - 1.0
 MEAN 0.3967 AVERAGE DEVIATION 0.0133
 STANDARD DEVIATION 0.0186 95 PCT. CONF. INTVL OF MEAN 0.3967 +OR- 0.0078

SAMPLE 25

FE

DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1			NOT DETERMINED
1-68	2	0.25 <i>g</i>	16.7	ATOMIC ABSORPTION (AQUEOUS)
1-68	3	0.29 <i>g</i>	3.3	ATOMIC ABSORPTION (AQUEOUS)
1-68	4	0.32 <i>g</i>	6.7	ATOMIC ABSORPTION (AQUEOUS)
1-68	5	0.31 <i>g</i>	3.3	ATOMIC ABSORPTION (AQUEOUS)
1-68	6	0.30 <i>g</i>	0.0	ATOMIC ABSORPTION (AQUEOUS)
12-67	7	0.30 <i>g</i>	0.0	ATOMIC ABSORPTION (AQUEOUS)
1-68	8	0.25 <i>g</i>	16.7	PERSULFATE, ALPHA STD. METH., 1965
12-67	9	0.33 <i>g</i>	10.0	ATOMIC ABSORPTION (AQUEOUS)
12-67	10			NOT DETERMINED
1-68	11	0.57 <i>g</i>	90.0	REJECT PERMANGANATE, USGS WSP 1454, D124A-1
1-68	12	0.26 <i>g</i>	13.3	ATOMIC ABSORPTION (AQUEOUS)
12-67	13	0.32 <i>g</i>	6.7	ATOMIC ABSORPTION (AQUEOUS)
1-68	14			NOT DETERMINED
1-68	15	0.43 <i>g</i>	43.3	ATOMIC ABSORPTION (AQUEOUS)
1-68	16	0.28 <i>g</i>	6.7	OTHER
1-68	17	0.31 <i>g</i>	3.3	ATOMIC ABSORPTION (AQUEOUS)
1-68	18	0.34 <i>g</i>	13.3	ATOMIC ABSORPTION (AQUEOUS)
0-0	19	0.25 <i>g</i>	16.7	ATOMIC ABSORPTION (AQUEOUS)
1-68	20	0.30 <i>g</i>	0.0	ATOMIC ABSORPTION (AQUEOUS)
1-68	21	0.36 <i>g</i>	20.0	ATOMIC ABSORPTION (AQUEOUS)
1-68	22	0.28 <i>g</i>	6.7	ATOMIC ABSORPTION (AQUEOUS)
1-68	23	0.26 <i>g</i>	13.3	ATOMIC ABSORPTION (AQUEOUS)
12-67	24			NOT DETERMINED
0-0	25			NOT DETERMINED
1-68	27	0.24 <i>g</i>	20.0	PERSULFATE, ALPHA STD. METH., 1965
0-0	29	0.40 <i>g</i>	33.3	PERMANGANATE, USGS WSP 1454, D124A-1
12-67	30	0.26 <i>g</i>	13.3	OTHER
0-0	32	0.26 <i>g</i>	13.3	ATOMIC ABSORPTION (AQUEOUS)

TOTAL RANGE 0.24 - 0.57
 MEAN 0.3000 AVERAGE DEVIATION 0.0365
 STANDARD DEVIATION 0.0488 95 PCT.CONF.INTVL OF MEAN 0.3000 +OR- 0.0211

SAMPLE 25

MN

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
12-67	1			NOT DETERMINED
1-68	2	0.24	50.4	REJECT ATOMIC ABSORPTION
1-68	3	0.50	3.3	ATOMIC ABSORPTION
1-68	4	0.51	5.4	ATOMIC ABSORPTION
1-68	5	0.50	3.3	ATOMIC ABSORPTION
1-68	6	0.50	3.3	ATOMIC ABSORPTION
12-67	7	0.47	2.9	ATOMIC ABSORPTION
1-68	8	0.50	3.3	ATOMIC ABSORPTION
12-67	9	0.50	3.3	ATOMIC ABSORPTION
12-67	10			NOT DETERMINED
1-68	11			NOT DETERMINED
1-68	12	0.50	3.3	ATOMIC ABSORPTION
12-67	13	0.50	3.3	ATOMIC ABSORPTION
1-68	14			NOT DETERMINED
1-68	15	0.65	34.3	REJECT ATOMIC ABSORPTION
1-68	16	0.46	4.9	ATOMIC ABSORPTION
1-68	17	0.48	0.8	ATOMIC ABSORPTION
1-68	18	0.50	3.3	ATOMIC ABSORPTION
0-0	19	0.48	0.8	ATOMIC ABSORPTION
1-68	20	0.44	9.1	ATOMIC ABSORPTION
1-68	21	0.50	3.3	ATOMIC ABSORPTION
1-68	22	0.49	1.3	ATOMIC ABSORPTION
1-68	23	0.42	13.2	ATOMIC ABSORPTION
12-67	24			NOT DETERMINED
0-0	25			NOT DETERMINED
1-68	27			NOT DETERMINED
0-0	29			NOT DETERMINED
12-67	30			NOT DETERMINED
0-0	32	0.46	4.9	ATOMIC ABSORPTION

TOTAL RANGE

0.24 - 0.65

SAMPLE 25

MEAN

0.4839 AVERAGE DEVIATION

0.0197

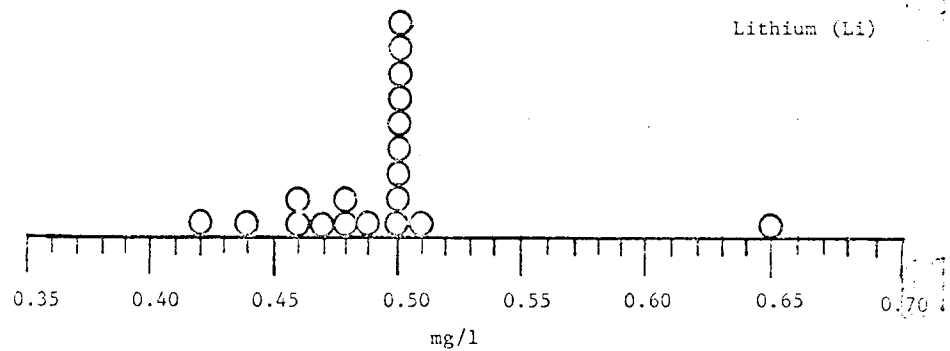
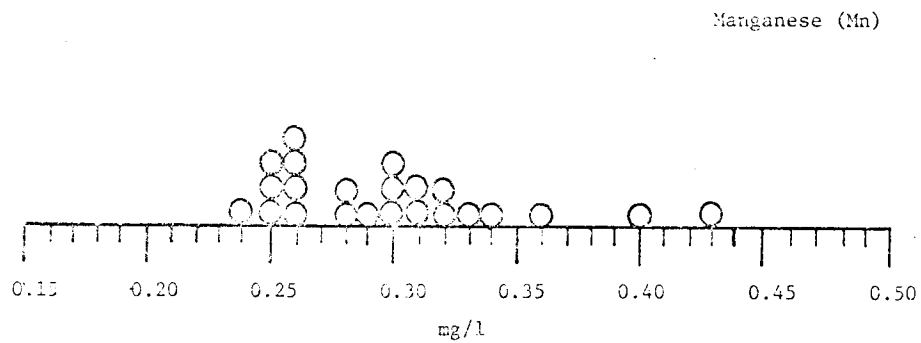
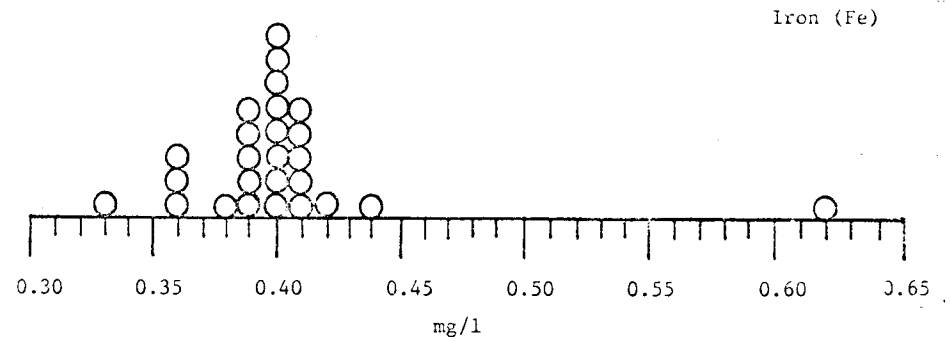
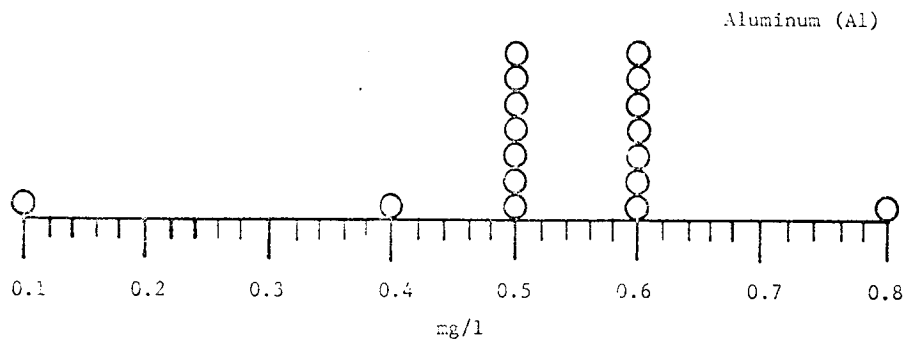
STANDARD DEVIATION

0.0248 95 PCT.CONF.INTVL OF MEAN

0.4839 +OR-

0.0123

LI



SAMPLE NO. 25

DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1			NOT DETERMINED
1-68	2	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	3	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	4	24	7.7	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	5	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	6	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
12-67	7	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	8	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
12-67	9	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
12-67	10			NOT DETERMINED
1-68	11	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	12	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
12-67	13	28	7.7	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	14			NOT DETERMINED
1-68	15	1.2	95.4	REJECT VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	16	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	17	27	3.8	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	18	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
0-0	19	25	3.8	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	20	25	3.8	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	21	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	22	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
1-68	23	25	3.8	VOLUMETRIC, USGS WSP 1454, D#1A-1
12-67	24	28	7.7	VOLUMETRIC, USGS WSP 1454, D#1A-1
0-0	25			NOT DETERMINED
1-68	27	26	0.0	VOLUMETRIC, USGS WSP 1454, D#1A-1
0-0	29	1370	*****	REJECT VOLUMETRIC, USGS WSP 1454, D#1A-1
12-67	30			NOT DETERMINED
0-0	32	1.6	93.8	REJECT VOLUMETRIC, USGS WSP 1454, D#1A-1

TOTAL RANGE
MEAN
STANDARD DEVIATION

1.2 - 1370
25.9998
0.8944

AVERAGE DEVIATION
95 PCT.CONF.INTVL OF MEAN

0.4763
25.9998 +0R- 0.4071 H+1

SAMPLE 25

DATE MU-YR	CODP	REPORTED VALUE	PCI, P.P.V. FROM MFAN	METHOD
12-67	1	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	2	1.6	10.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	3	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	4	1.6	10.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	5	1.8	0.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	6	2.2	23.2	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	7	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	8	1.8	0.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	9	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	10	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	11	1.9	6.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	12	1.8	0.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	13	1.9	6.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	14	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	15	1.8	0.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	16	1.6	10.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	17	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	18	2.0	12.0	INSTRUMENT METHOD, (POTENTIOMETRIC)
0-0	19	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	20	1.9	6.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	21	2.1	17.6	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	22	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	23	2.2	23.2	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	24	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
0-0	25	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
1-68	27	1.7	4.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
0-0	29	1.6	10.4	INSTRUMENT METHOD, (POTENTIOMETRIC)
12-67	30	1.8	0.8	INSTRUMENT METHOD, (POTENTIOMETRIC)
0-0	32			NOT DETERMINED

TOTAL RANGE 1.6 - 2.2
 MEAN 1.7557
 STANDARD DEVIATION 0.1671
 AVERAGE DEVIATION 0.1265
 95 PCI, CONF. LIMIT UP MFAN 1.7857 +0R-
 PH 0.0648
 SAMPLE 25

DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1			NOT DETERMINED
1-68	2	0.10 ⁹	15.8	ATOMIC ABSORPTION (AQUEOUS)
1-68	3	0.10	15.8	ATOMIC ABSORPTION (AQUEOUS)
1-68	4	0.12	1.1	ATOMIC ABSORPTION (AQUEOUS)
1-68	5	0.12	1.1	ATOMIC ABSORPTION (AQUEOUS)
1-68	6	0.10	15.8	ATOMIC ABSORPTION (AQUEOUS)
12-67	7	0.11	7.3	ATOMIC ABSORPTION (AQUEOUS)
1-68	8	0.12	1.1	ATOMIC ABSORPTION (AQUEOUS)
12-67	9	0.12	1.1	ATOMIC ABSORPTION (AQUEOUS)
12-67	10			NOT DETERMINED
1-68	11	0.15 ¹⁰	26.4	DIETHYLDITHIOCARBAMATE, USGS WSP 1454, D#14A-1
1-68	12	0.10 ⁹	15.8	ATOMIC ABSORPTION (AQUEOUS)
12-67	13	0.10	15.8	ATOMIC ABSORPTION (AQUEOUS)
1-68	14			NOT DETERMINED
1-68	15	0.12 ⁹	1.1	ATOMIC ABSORPTION (AQUEOUS)
1-68	16	0.08	32.6	ATOMIC ABSORPTION (AQUEOUS)
1-68	17	0.10	15.8	ATOMIC ABSORPTION (AQUEOUS)
1-68	18	0.09	24.2	ATOMIC ABSORPTION (AQUEOUS)
0-0	19	0.13	9.5	ATOMIC ABSORPTION (AQUEOUS)
1-68	20	0.16	34.8	ATOMIC ABSORPTION (AQUEOUS)
1-68	21	0.19	60.1	ATOMIC ABSORPTION (AQUEOUS)
1-68	22	0.11 ⁹	7.3	ATOMIC ABSORPTION (AQUEOUS)
1-68	23			NOT DETERMINED
12-67	24			NOT DETERMINED
0-0	25			NOT DETERMINED
1-68	27	0.11 ¹¹	7.3	CUPRETHOL, APHA STD. METH., 1965
0-0	29	0.20 ¹¹	68.5	CUPRETHOL, APHA STD. METH., 1965
12-67	30	0.09 ¹⁰	24.2	OTHER
0-0	32	0.11 ⁹	7.3	ATOMIC ABSORPTION (AQUEOUS)

TOTAL RANGE	0.08	-	0.20				
MEAN	0.1187		AVERAGE DEVIATION	0.0211			
STANDARD DEVIATION	0.0302		95 PCT.CONF.INTVL OF MEAN	0.1187 +OR-	0.0131		CU

SAMPLE 25

DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1			NOT DETERMINED
1-68	2	0.12 7	7.2	ATOMIC ABSORPTION
1-68	3	0.11	1.7	ATOMIC ABSORPTION
1-68	4	0.12	7.2	ATOMIC ABSORPTION
1-68	5	0.12	7.2	ATOMIC ABSORPTION
1-68	6	0.10	10.6	ATOMIC ABSORPTION
12-67	7	0.11	1.7	ATOMIC ABSORPTION
1-68	8	0.12	7.2	ATOMIC ABSORPTION
12-67	9	0.13	16.2	ATOMIC ABSORPTION
12-67	10			NOT DETERMINED
1-68	11	0.64 8	471.9	REJECT DIRECT COLOR COMPARISON, USGS WSP 1454, D-42A-2
1-68	12	0.11 7	1.7	ATOMIC ABSORPTION
12-67	13	0.08 7	28.5	ATOMIC ABSORPTION
1-68	14			NOT DETERMINED
1-68	15	0.05 7	55.3	ATOMIC ABSORPTION
1-68	16	0.11	1.7	ATOMIC ABSORPTION
1-68	17	0.12	7.2	ATOMIC ABSORPTION
1-68	18	0.17	51.9	ATOMIC ABSORPTION
0- 0	19	0.13	16.2	ATOMIC ABSORPTION
1-68	20	0.12	7.2	ATOMIC ABSORPTION
1-68	21	0.16	43.0	ATOMIC ABSORPTION
1-68	22	0.12	7.2	ATOMIC ABSORPTION
1-68	23			NOT DETERMINED
12-67	24			NOT DETERMINED
0- 0	25			NOT DETERMINED
1-68	27			NOT DETERMINED
0- 0	29	0.05 9	55.3	ZINCON, ANAL. CHEM., 31, 1226 (1959)
12-67	30	0.10 20	10.6	OTHER
0- 0	32	0.10 7	10.6	ATOMIC ABSORPTION

TOTAL RANGE

0.05 - 0.64

MEAN

0.1119 AVERAGE DEVIATION

0.0190

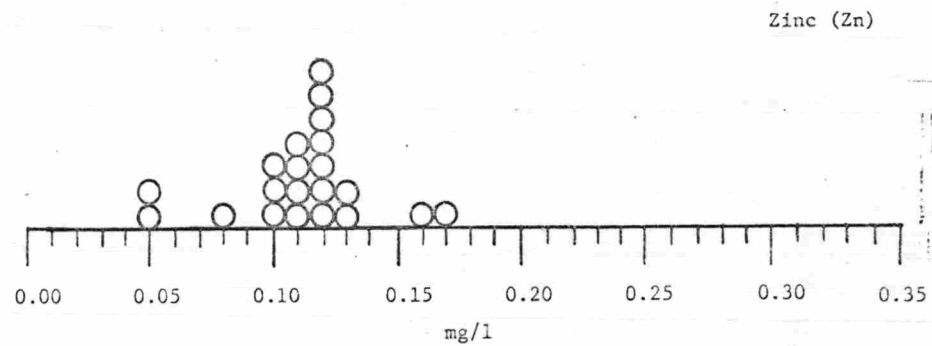
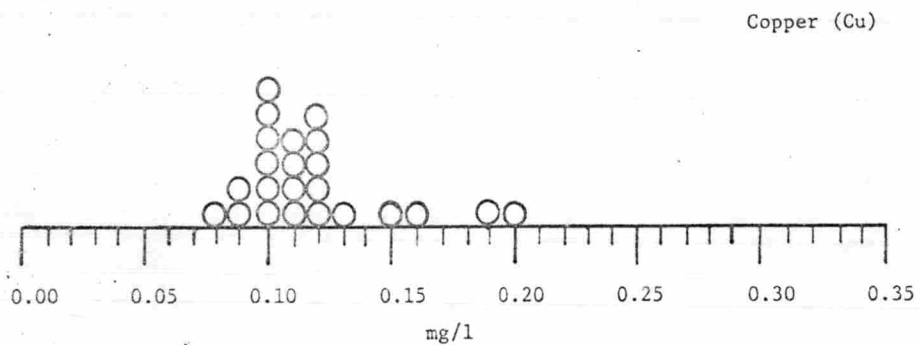
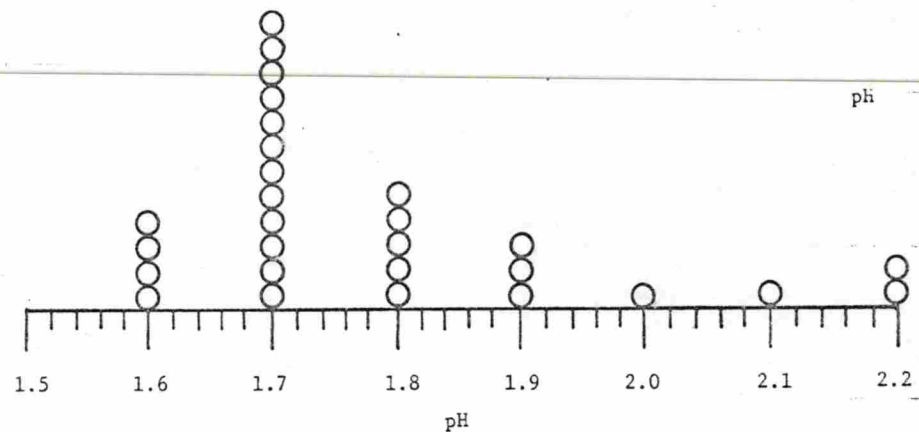
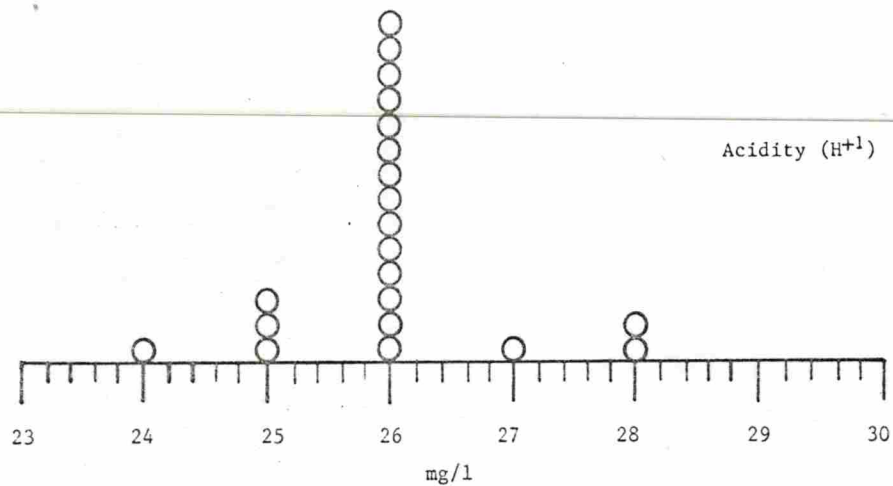
SAMPLE 25

STANDARD DEVIATION

0.0282 95 PCT.CONF.INTVL OF MEAN

0.1119 +OR- 0.0128

ZN



SAMPLE NO. 25

DATE MU-YR CURR REPORTING VALUE PCT. DEFV. FROM MEAN METHOD

DATE	MU-YR	CURR	REPORTING VALUE	PCT. DEFV. FROM MEAN	METHOD
12-67		1			NOT DETERMINED
1-68		2	0.25	10.5	ATOMIC ABSORPTION
1-68		3	0.28	0.2	ATOMIC ABSORPTION
1-68		4	0.26	7.0	ATOMIC ABSORPTION
1-68		5	0.42	50.3	REJECT
1-68		6	0.34	21.7	ATOMIC ABSORPTION
12-67		7	0.25	10.5	ATOMIC ABSORPTION
1-68		8	0.30	7.4	ATOMIC ABSORPTION
12-67		9	0.23	17.7	ATOMIC ABSORPTION
12-67		10			NOT DETERMINED
1-68		11			NOT DETERMINED
1-68		12	0.29	3.8	ATOMIC ABSORPTION
12-67		13	0.28	0.2	ATOMIC ABSORPTION
1-68		14			NOT DETERMINED
1-68		15	0.06	78.5	REJECT
1-68		16	0.30	7.4	ATOMIC ABSORPTION
1-68		17	0.27	3.4	ATOMIC ABSORPTION
1-68		18	0.27	3.4	ATOMIC ABSORPTION
0-0		19	0.25	10.5	ATOMIC ABSORPTION
1-68		20	0.30	7.4	ATOMIC ABSORPTION
1-68		21	0.29	3.8	ATOMIC ABSORPTION
1-68		22	0.25	10.5	ATOMIC ABSORPTION
1-68		23	0.31	10.9	ATOMIC ABSORPTION
12-67		24			NOT DETERMINED
0-0		25			NOT DETERMINED
1-68		27			NOT DETERMINED
0-0		29			NOT DETERMINED
12-67		30	0.16	42.7	REJECT
0-0		32	0.31	10.9	OTHER
					ATOMIC ABSORPTION

TOTAL RANGE 0.06
 MEAN 0.2794
 STANDARD DEVIATION 0.0282
 AVERAGE DEVIATION 0.0228
 95 PCT. CONF. INTVL UP MEAN 0.2794 +0K-
 SR 0.0140
 SAMPLE 25

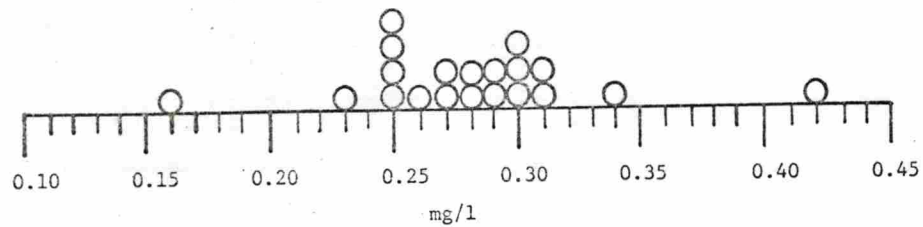
DATE MO-YR	CODE	REPORTED VALUE	PCT. DEV. FROM MEAN	METHOD
12-67	1			NOT DETERMINED
1-68	2	0.02 <i>6</i>	47.1	SILVER DIETHYLDITHIOCARBAMATE (STRATTON ADAPTATION)
1-68	3	0.06 <i>6</i>	58.6	SILVER DIETHYLDITHIOCARBAMATE (STRATTON ADAPTATION)
1-68	4	0.05 <i>7</i>	32.2	GUTZEIT-VOLUMETRIC, USGS WSP 1454, D#4A-1
1-68	5	0.03 <i>6</i>	20.7	SILVER DIETHYLDITHIOCARBAMATE (STRATTON ADAPTATION)
1-68	6			NOT DETERMINED
12-67	7	0.04 <i>6</i>	5.7	SILVER DIETHYLDITHIOCARBAMATE (STRATTON ADAPTATION)
1-68	8	0.05 <i>6</i>	32.2	SILVER DIETHYLDITHIOCARBAMATE (STRATTON ADAPTATION)
12-67	9			NOT DETERMINED
12-67	10			NOT DETERMINED
1-68	11			NOT DETERMINED
1-68	12			NOT DETERMINED
12-67	13	0.01 <i>6</i>	73.6	SILVER DIETHYLDITHIOCARBAMATE (STRATTON ADAPTATION)
1-68	14			NOT DETERMINED
1-68	15			NOT DETERMINED
1-68	16			NOT DETERMINED
1-68	17	0.04 <i>6</i>	5.7	SILVER DIETHYLDITHIOCARBAMATE (STRATTON ADAPTATION)
1-68	18	0.05 <i>4</i>	32.2	SILVER DIETHYLDITHIOCARBAMATE, ALPHA STD. METH., 1965
0-0	19	0.05 <i>4</i>	32.2	SILVER DIETHYLDITHIOCARBAMATE, ALPHA STD. METH., 1965
1-68	20			NOT DETERMINED
1-68	21			NOT DETERMINED
1-68	22	0.004 <i>W</i>	89.4	OTHER
1-68	23			NOT DETERMINED
12-67	24			NOT DETERMINED
0-0	25			NOT DETERMINED
1-68	27			NOT DETERMINED
0-0	29			NOT DETERMINED
12-67	30	0.05 <i>4</i>	32.2	SILVER DIETHYLDITHIOCARBAMATE, ALPHA STD. METH., 1965
0-0	32			NOT DETERMINED

TOTAL RANGE 0.004 - 0.06
MEAN 0.0378 AVERAGE DEVIATION 0.0146
STANDARD DEVIATION 0.0179 95 PCT.CONF.INTVL OF MEAN 0.0378 +OR- 0.0114 AS

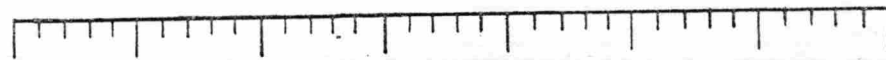
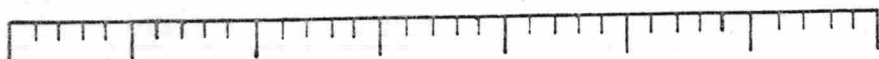
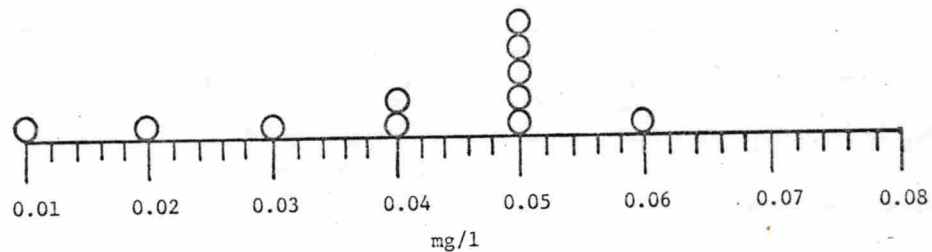
SAMPLE 25

AS

Strontium (Sr)



Arsenic (As)



SAMPLE NO. 25