

# Native Spring Investigation Data Report

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# Naval Air Weapons Station China Lake

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## FOREWORD

The research described in this report was performed at the Naval Air Weapons Station (NAWS) China Lake as part of a native springs investigation conducted during fiscal year (FY) 94. This report documents the data collection and results of water quality, geologic mapping, and aerial resistivity properties for each of 31 native springs investigated.

This work was performed in accordance with NAWS Contract No. N60530-90-D-0071, Delivery Order No. 0020. The results of this report were reviewed for technical accuracy by Thomas Campbell and are final in nature. This report is approved for public release with unlimited distribution.

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## INTRODUCTION

A series of native springs in the Indian Wells Valley were investigated by the NAWS China Lake Environmental Project Office during FY94 to gather baseline geophysical and geological data. Thirty-one native springs (Table 1) located in the north and south test ranges (Figures 1 and 2) at NAWS China Lake were sampled for water quality. Air photographs of each spring site were taken for geohydrologic interpretation, and the location of each spring was surveyed for its aerial resistivity properties and geologic mapping.

Springs were selected for investigation by their importance as a water resource for the following:

1. Usage by facilities located in remote areas
2. Usage by grazing cattle in remote areas
3. Wildlife usage
4. Feral horse and burro usage

Results from this investigation will be used as a resource for the FY95 NAWS China Lake Spring Management Plan.

## DATA COLLECTION

### WATER CHEMISTRY/ISOTOPIC COMPOSITION

Water samples were collected from each native spring and analyzed for isotopic composition (oxygen 16:18 ratios, tritium, and deuterium), methylene blue active substances (MBAS), pH, specific conductance, total filterable residue, and general mineral content as follows:

|                 |                |                   |
|-----------------|----------------|-------------------|
| •Aluminum       | •Arsenic       | •Barium           |
| •Bicarbonate    | •Boron         | •Bromide          |
| •Cadmium        | •Calcium       | •Carbonate        |
| •Chloride       | •Copper        | •Fluoride         |
| •Hydroxide      | •Iron          | •Lead             |
| •Lithium        | •Magnesium     | •Manganese        |
| •Mercury        | •Nitrates      | •Potassium        |
| •Selenium       | •Silica        | •Silver           |
| •Sodium         | •Sulfate       | •Total Alkalinity |
| •Total Anions   | •Total Cations | •Total Chromium   |
| •Total Hardness | •Zinc          |                   |

Field measurements of pH were recorded with a Hanna pH meter, calibrated at least twice a day using two standard reference solutions. Conductivity was measured with a YSI 3000 TLC meter, calibrated daily. Conductivity and pH readings measured in the field are more accurate representations of existing conditions because bacterial reactions in the sample bottles may occur, which can change the pH readings. A field thermometer was used to record the temperature of each native spring.

Water analyses are presented in Table 2. The important mineral species and isotope compositions of each native spring are graphically highlighted in Appendix A. Spring locations are identified by their assigned number (Table 1), and constituents are reported in milligrams per liter (mg/L). Maximum contaminant levels (MCL) are designated on mineral species with applicable state and federal standards.

## RESISTIVITY SURVEYS

Direct current resistivity measurements were completed at 10 spring locations to provide subsurface information that will aid in the interpretation of structural and geohydrologic features that may control the occurrence of each spring.

The surveys were completed with an ABEM Terrameter 300B and several standard electrode arrays. Gradient arrays were set at 800-foot-current electrode separations. A roving receiver dipole was used to map out the areas in between these separations. This array was useful as a "contact finder" in locating features such as basement dikes. Schlumberger depth soundings were used to investigate layering beneath a specific site, such as a water table. Schlumberger profiling was completed by moving a fixed-spacing array along a line of investigation, such as a canyon bottom.

Results of each survey are graphically described as "apparent resistivity" and as graphic symbols superimposed on aerial photographs of the springs. Notations from the survey are included on each graph, such as geographic locations and changes in rock and/or soil types. In the photographic presentations, the width of each profile symbol is proportional to resistivity, thus allowing the reader to correlate resistivity anomalies with features such as joints and faults that are not visible on the United States Geological Survey topographic maps. Plates displaying aerial photographs with resistivity lines superimposed on them are presented in Appendix B.

## GEOLOGIC MAPS

Depending on the individual characteristics and aerial extent of each spring, geologic maps were constructed using the following scales:

1. 1 inch equals 50 feet
2. 1 inch equals 100 feet
3. 1 inch equals 150 feet
4. 1 inch equals 200 feet

Aerial stereographic and ground photographs were used in mapping each spring site. The negative scales for the types of films used are as follows:

1. Stereo-imagery in false-color infrared flown at low altitudes: 1 inch equals 300 feet.
2. True-color aerial color film at slightly higher altitudes: 1 inch equals 600 feet.
3. High-altitude false-color photographs: 1 inch equals 1600 feet.

These high-altitude prints, which became available late in the investigation, were extremely useful in providing a more even exposure in areas of steep slopes and deep canyons as a result of higher sun angles.

Each photograph was enlarged with a laser color copier for field use and a digital scanner for computer work. Raster images were overlaid onto the digitized topography to furnish the correct scale and location. These combined ground and photographic interpretations were computer drafted using AutoCad Version 12 and CadOverlay GSX Version 2 to provide a final drawing of each spring site. The geologic maps are listed alphabetically by spring name in Appendix C.

TABLE 1. Spring Site Work Accomplished.

| Spring no. | Spring name         | Chemical analyses | Resistivity survey | Air photos | Geologic maps |
|------------|---------------------|-------------------|--------------------|------------|---------------|
| 1.         | Amity               | x                 | x                  | x          | x             |
| 2.         | Bircham             | x                 | x                  | x          | x             |
| 3.         | China Gardens       | x                 |                    | x          | x             |
| 4.         | Cole                | x                 | x                  | x          | x             |
| 5.         | Crystal             | x                 | x                  | x          | x             |
| 6.         | Darwin              | x                 |                    | x          | x             |
| 7.         | Dead End            | x                 |                    | x          | x             |
| 8.         | Granite Wells       | x                 |                    | x          | x             |
| 9.         | Haiwee              | x                 |                    | x          |               |
| 10.        | Hidden              | x                 |                    | x          | x             |
| 11.        | Indian              | x                 |                    | x          | x             |
| 12.        | Indian Gardens      | x                 | x                  | x          | x             |
| 13.        | Lamotte             | x                 |                    | x          | x             |
| 14.        | Layton              | x                 |                    | x          | x             |
| 15.        | Lead Pipe           | x                 | x                  | x          | x             |
| 16.        | Mammoth Mine        | x                 |                    | x          | x             |
| 17.        | Margaret Ann        | x                 |                    | x          | x             |
| 18.        | Mariposa            | x                 | x                  | x          | x             |
| 19.        | Mesquite            | x                 |                    | x          | x             |
| 20.        | Myrick              | x                 |                    | x          |               |
| 21.        | Newhouse            | x                 | x                  | x          | x             |
| 22.        | N. Mountain Springs | x                 |                    | x          | x             |
| 23.        | Old House           | x                 | x                  | x          | x             |
| 24.        | Pink Hill           | x                 |                    | x          | x             |
| 25.        | Rudy                | x                 |                    | x          | x             |
| 26.        | Seep                | x                 |                    | x          | x             |
| 27.        | Stone Corral        | x                 |                    | x          | x             |
| 28.        | Tennessee           | x                 | x                  | x          | x             |
| 29.        | Upper Tunnel        | x                 |                    | x          | x             |
| 30.        | Wild Rose           | x                 |                    | x          | x             |
| 31.        | Wilson Canyon       | x                 |                    | x          | x             |

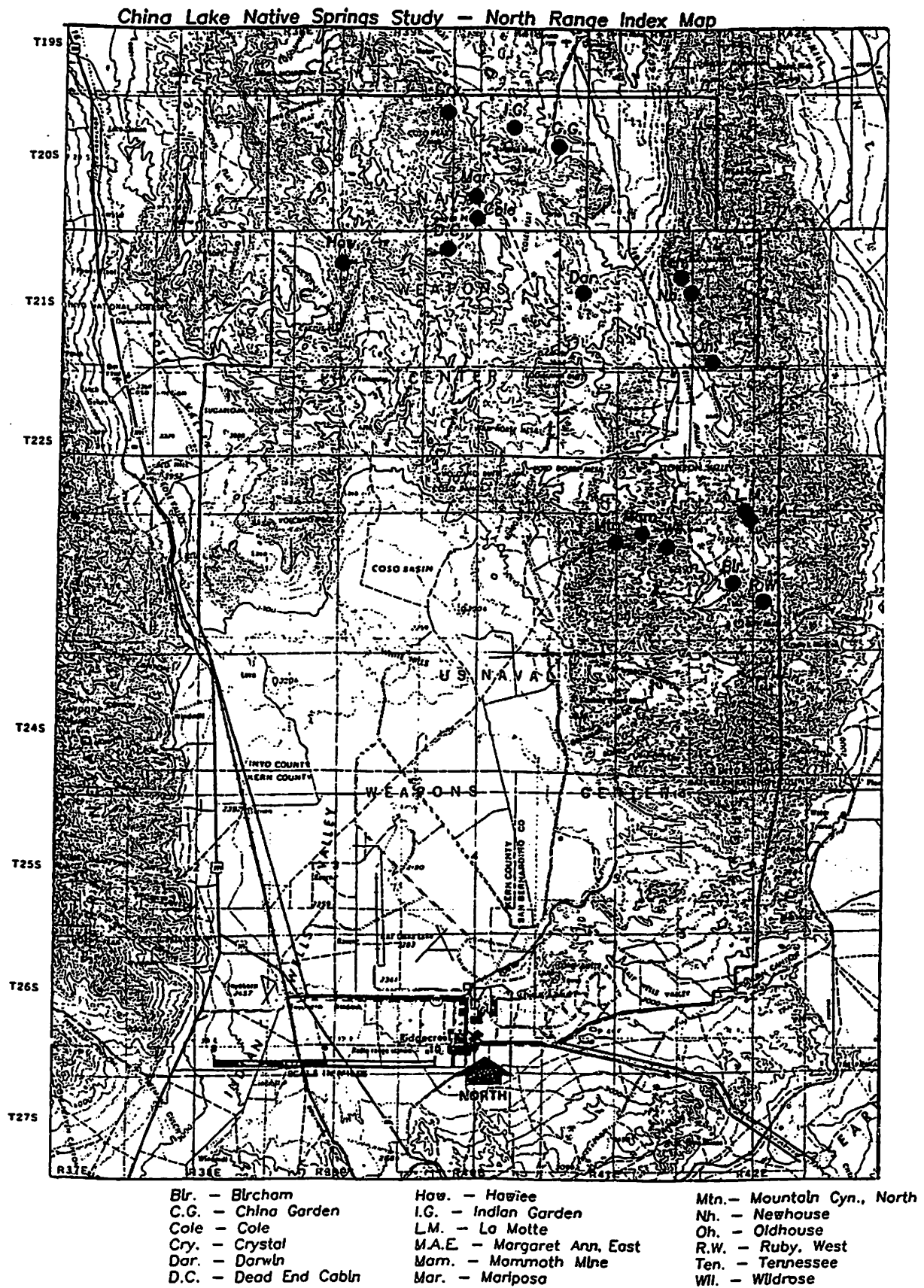


FIGURE 1. China Lake Native Spring Study - North Range Index Map.

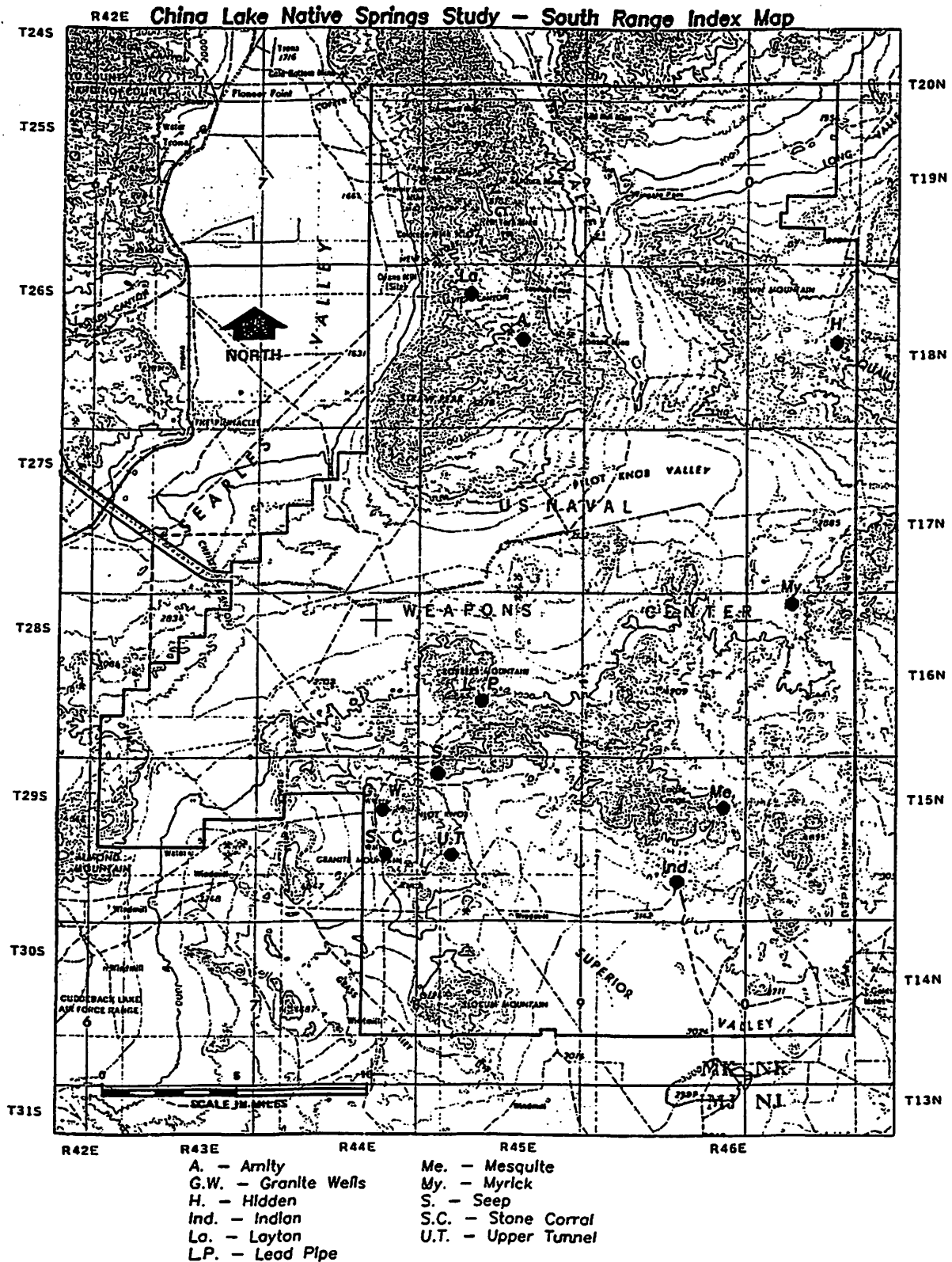


FIGURE 2. China Lake Native Spring Study - South Range Index Map.

TABLE 2. NAWS China Lake Native Spring Study Chemical Analyses.

## CHEMICAL ANALYSES

## China Lake/NAWS Native Spring Study

| Species Analyses                      | Units    | Amity  | Bircham | China Garden | Cole     | Crystal | Darwin | Dead End | Granite  | Halwee | Hidden |
|---------------------------------------|----------|--------|---------|--------------|----------|---------|--------|----------|----------|--------|--------|
| Aluminum (Al)                         | mg/L     | <0.05  | <0.05   | <0.05        | <0.05    | <0.05   | <0.05  | <0.05    | <0.05    | <0.05  | <0.05  |
| Arsenic (As)                          | mg/L     | <0.005 | <0.005  | <0.005       | <0.005   | <0.005  | <0.005 | <0.005   | <0.005   | <0.005 | 0.012  |
| Barium (Ba)                           | mg/L     | <0.1   | <0.1    | <0.1         | <0.1     | <0.1    | <0.1   | <0.1     | <0.1     | <0.1   | <0.1   |
| Bicarbonate (HCO <sub>3</sub> )       | mg/L     | 336    | 238     | 107          | 183      | 137     | 183    | 250      | 244      | 153    | 207    |
| Boron (B)                             | mg/L     | 0.3    | 0.2     | 0.2          | <0.1     | <0.1    | 0.1    | 0.2      | 0.3      | <0.1   | 0.4    |
| Bromide (Br)                          | mg/L     | <1     | <1      | <1           | <1       | <1      | <1     | <1       | <1       | <1     | <1     |
| Cadmium (Cd)                          | mg/L     | <0.001 | <0.001  | <0.001       | <0.001   | <0.001  | <0.001 | <0.001   | <0.001   | <0.001 | <0.001 |
| Calcium (Ca)                          | mg/L     | 93     | 52      | 49           | 143      | 66      | 83     | 61       | 65       | 33     | 30     |
| Carbonate (CO <sub>3</sub> )          | mg/L     | 0      | 0       | 0            | 0        | 0       | 0      | 0        | 0        | 0      | 0      |
| Chloride (Cl)                         | mg/L     | 75     | 27      | 32           | 38       | 50      | 33     | 23       | 42       | 15     | 51     |
| Copper (Cu)                           | mg/L     | <0.01  | <0.01   | <0.01        | <0.01    | <0.01   | <0.01  | <0.01    | <0.01    | <0.01  | <0.01  |
| Fluoride (F)                          | mg/L     | 1.1    | 0.2     | 0.1          | 0.2      | 0.1     | 0.2    | 0.3      | 0.7      | 0.4    | 0.8    |
| Hydroxide (OH)                        | mg/L     | 0      | 0       | 0            | 0        | 0       | 0      | 0        | 0        | 0      | 0      |
| Iron (Fe)                             | mg/L     | <0.02  | <0.02   | <0.02        | <0.02    | 0.02    | <0.02  | <0.02    | <0.02    | <0.02  | <0.02  |
| Lead (Pb)                             | mg/L     | <0.005 | <0.005  | <0.005       | <0.005   | 0.005   | <0.005 | <0.005   | <0.005   | <0.005 | <0.005 |
| Lithium (Li)                          | mg/L     | 0.02   | <0.01   | <0.01        | <0.01    | <0.01   | 0.01   | <0.01    | 0.03     | <0.01  | 0.03   |
| Magnesium (Mg)                        | mg/L     | 31     | 14      | 15           | 46       | 11      | 15     | 12       | 9        | 16     | 16     |
| Manganese (Mn)                        | mg/L     | <0.01  | 0.02    | <0.01        | <0.01    | 0.03    | <0.01  | 0.13     | <0.01    | <0.01  | 0.05   |
| NIBAS                                 | mg/L     | <0.05  | <0.05   | <0.05        | <0.05    | <0.05   | <0.05  | <0.05    | <0.05    | <0.05  | <0.05  |
| Mercury (Hg)                          | mg/L     | <0.001 | <0.001  | <0.001       | <0.001   | <0.001  | <0.001 | <0.001   | <0.001   | <0.001 | <0.001 |
| Nitrate (NO <sub>3</sub> )            | mg/L     | 24     | 8       | 6            | 4        | 1       | 4      | <1       | 37       | <1     | 42     |
| pH - lab                              | pH units | 7.8    | 8.0     | 8.0          | 7.5      | 7.8     | 7.8    | 7.4      | 7.9      | 8      | 7.9    |
| pH - field                            | pH units | 7.5    | 7.4     | 7.7          | 7.2      | 7.4     | 7.2    | 6.8      | 7.3      | 7.8    | 7.4    |
| Potassium (K)                         | mg/L     | 3      | 3       | 6            | 4        | 5       | 3      | 2        | 2        | 5      | 7      |
| Selenium (Se)                         | mg/L     | <0.005 | <0.005  | <0.005       | <0.005   | <0.005  | <0.005 | <0.005   | <0.005   | <0.005 | <0.005 |
| Silica (SiO <sub>2</sub> )            | mg/L     | 36     | 32      | 41           | 30       | 30      | 41     | 36       | 58       | 60     | 73     |
| Silver (Ag)                           | mg/L     | <0.01  | <0.01   | <0.01        | <0.01    | <0.01   | <0.01  | <0.01    | <0.01    | <0.01  | <0.01  |
| Sodium (Na)                           | mg/L     | 61     | 28      | 32           | 40       | 18      | 35     | 33       | 59       | 27     | 59     |
| Specific Conductance - lab            | µmho/cm  | 880    | 460     | 520          | 1080     | 520     | 670    | 500      | 680      | 410    | 630    |
| Specific Conductance - field          | µmho/cm  | 962    | 480     | 493          | 1155     | 521     | 675    | 537      | 676      | 418    | 678    |
| Sulfate (SO <sub>4</sub> )            | mg/L     | 100    | 19      | 120          | 430      | 67      | 140    | 40       | 53       | 63     | 57     |
| Total Alkalinity as CaCO <sub>3</sub> | mg/L     | 275    | 195     | 88           | 150      | 113     | 150    | 205      | 200      | 135    | 170    |
| Total Anions                          | me/L     | 10.14  | 5.20    | 5.25         | 13.10    | 5.08    | 6.92   | 5.60     | 6.92     | 4.25   | 6.75   |
| Total Cations                         | me/L     | 9.96   | 5.07    | 5.24         | 12.82    | 5.13    | 7.00   | 5.53     | 6.62     | 4.28   | 6.58   |
| Total Chromium (Cr)                   | mg/L     | <0.01  | <0.01   | <0.01        | <0.01    | <0.01   | <0.01  | <0.01    | <0.01    | <0.01  | <0.01  |
| Total Filterable Residue              | mg/L     | 610    | 295     | 375          | 820      | 315     | 520    | 330      | 440      | 285    | 455    |
| Total Hardness as CaCO <sub>3</sub>   | mg/L     | 362    | 188     | 185          | 549      | 211     | 270    | 203      | 200      | 149    | 192    |
| Zinc (Zn)                             | mg/L     | <0.01  | <0.01   | <0.01        | 0.01     | <0.01   | 0.02   | 0.04     | <0.01    | <0.01  | <0.01  |
| Isotope Analyses                      |          |        |         |              |          |         |        |          |          |        |        |
| Tritium                               | T. units | 1.0    | <1.7    | <0.7         | <1.1     | <0.7    | 0.7    | 1.4      | <1.2     | 1.4    | <1.5   |
| Statistical significance              |          | ±0.3   |         |              | App. 0.4 |         | ±0.3   | ±0.4     | App. 0.6 | ±0.4   |        |
| Deuterium                             | %SMOW    | -82    | -91     | -98          | -94      | -103    | -95    | -92      | -83      | -93    | -84    |
| Oxygen 18                             | %SMOW    | -11.5  | -12.1   | -13.0        | -12.8    | -13.9   | -13.2  | -12.7    | -10.6    | -13.2  | -9.8   |

TABLE 2. (Contd.)

## CHEMICAL ANALYSES

## China Lake NAWS Native Spring Study

| Species Analyses                      | Units    | Indian | Indian Garden | La Motte | Layton | Lead Pipe | Mammoth Mine | Margaret Ann - E. | Mariposa | Mesquite | Myrick |
|---------------------------------------|----------|--------|---------------|----------|--------|-----------|--------------|-------------------|----------|----------|--------|
| Aluminum (Al)                         | mg/L     | <0.05  | <0.05         | <0.05    | <0.05  | <0.05     | <0.05        | <0.05             | <0.05    | <0.05    | <0.05  |
| Arsenic (As)                          | mg/L     | <0.005 | <0.005        | <0.005   | <0.005 | 0.018     | <0.005       | <0.005            | 0.013    | <0.005   | 0.11   |
| Barium (Ba)                           | mg/L     | <0.1   | <0.1          | <0.1     | <0.1   | <0.1      | 0.1          | <0.1              | <0.1     | <0.1     | <0.1   |
| Bicarbonate (HCO <sub>3</sub> )       | mg/L     | 107    | 122           | 290      | 366    | 122       | 302          | 427               | 326      | 153      | 1530   |
| Boron (B)                             | mg/L     | 0.2    | 0.2           | <0.1     | 2.7    | 0.3       | 0.2          | 0.4               | 0.1      | 0.1      | 3.6    |
| Bromide (Br)                          | mg/L     | <1     | <1            | <1       | <1     | <1        | <1           | <1                | <1       | <1       | <1     |
| Cadmium (Cd)                          | mg/L     | <0.001 | <0.001        | <0.001   | <0.001 | <0.001    | <0.001       | 0.003             | <0.001   | <0.001   | <0.001 |
| Calcium (Ca)                          | mg/L     | 18     | 68            | 67       | 114    | 26        | 64           | 175               | 255      | 35       | 10     |
| Carbonate (CO <sub>3</sub> )          | mg/L     | 0      | 0             | 0        | 0      | 0         | 0            | 0                 | 0        | 0        | 78     |
| Chloride (Cl)                         | mg/L     | 26     | 32            | 36       | 200    | 37        | 40           | 64                | 54       | 26       | 200    |
| Copper (Cu)                           | mg/L     | <0.01  | <0.01         | <0.01    | <0.01  | <0.01     | <0.01        | <0.01             | <0.01    | <0.01    | 0.03   |
| Fluoride (F)                          | mg/L     | 0.3    | 0.2           | 0.4      | 1.6    | 0.5       | 0.3          | 0.8               | 0.4      | 0.4      | 8.2    |
| Hydroxide (OH)                        | mg/L     | 0      | 0             | 0        | 0      | 0         | 0            | 0                 | 0        | 0        | 0      |
| Iron (Fe)                             | mg/L     | <0.02  | <0.02         | <0.02    | <0.02  | <0.02     | 0.02         | <0.02             | <0.02    | <0.02    | 1.8    |
| Lead (Pb)                             | mg/L     | <0.005 | <0.005        | <0.005   | <0.005 | <0.005    | <0.005       | <0.005            | <0.005   | <0.005   | 0.006  |
| Lithium (Li)                          | mg/L     | 0.02   | <0.01         | <0.01    | 0.06   | 0.06      | <0.01        | 0.01              | <0.01    | 0.02     | 0.11   |
| Magnesium (Mg)                        | mg/L     | 9      | 18            | 18       | 40     | 4         | 16           | 45                | 46       | 8        | 3      |
| Manganese (Mn)                        | mg/L     | <0.01  | <0.01         | 0.03     | <0.01  | <0.01     | 0.43         | <0.01             | 0.11     | <0.01    | 0.18   |
| MBAS                                  | mg/L     | <0.05  | <0.05         | <0.05    | <0.05  | <0.05     | <0.05        | <0.05             | <0.05    | <0.05    | <0.05  |
| Mercury (Hg)                          | mg/L     | <0.001 | <0.001        | <0.001   | <0.001 | <0.001    | <0.001       | <0.001            | <0.001   | <0.001   | <0.001 |
| Nitrate (NO <sub>3</sub> )            | mg/L     | 22     | <1            | <1       | 25     | 13        | <1           | <1                | <1       | 29       | <1     |
| pH - lab                              | pH units | 7.8    | 7.8           | 8.1      | 7.7    | 7.7       | 7.7          | 7.8               | 7.4      | 7.7      | 8.8    |
| pH - field                            | pH units | 8.1    | 7.5           | 8.0      | 7.4    | 7.0       | 7.4          | 7.7               | 6.9      | 7.4      | 8.4    |
| Potassium (K)                         | mg/L     | 7      | 6             | 2        | 2      | 6         | 6            | 4                 | 4        | 6        | 24     |
| Selenium (Se)                         | mg/L     | <0.005 | <0.005        | <0.005   | 0.006  | <0.005    | <0.005       | <0.005            | <0.005   | <0.005   | <0.005 |
| Silica (SiO <sub>2</sub> )            | mg/L     | 100    | 36            | 41       | 32     | 103       | 32           | 42                | 64       | 92       | 66     |
| Silver (Ag)                           | mg/L     | <0.01  | <0.01         | <0.01    | <0.01  | <0.01     | <0.01        | <0.01             | <0.01    | <0.01    | <0.01  |
| Sodium (Na)                           | mg/L     | 36     | 39            | 38       | 222    | 55        | 47           | 95                | 45       | 36       | 860    |
| Specific Conductance - lab            | pmho/cm  | 340    | 670           | 560      | 1510   | 420       | 600          | 1400              | 1530     | 420      | 3500   |
| Specific Conductance - field          | pmho/cm  | 362    | 672           | 636      | 1188   | 449       | 673          | 1449              | 1557     | 427      | 3450   |
| Sulfate (SO <sub>4</sub> )            | mg/L     | 30     | 190           | 41       | 330    | 46        | 43           | 390               | 560      | 27       | 250    |
| Total Alkalinity as CaCO <sub>3</sub> | mg/L     | 88     | 100           | 238      | 300    | 100       | 248          | 350               | 268      | 125      | 1390   |
| Total Anions                          | me/L     | 3.48   | 6.87          | 6.63     | 18.99  | 4.24      | 7.00         | 16.97             | 18.56    | 4.28     | 38.97  |
| Total Cations                         | me/L     | 3.40   | 6.75          | 6.55     | 18.73  | 4.17      | 6.72         | 16.73             | 18.64    | 4.14     | 38.76  |
| Total Chromium (Cr)                   | mg/L     | <0.01  | <0.01         | <0.01    | <0.01  | <0.01     | <0.01        | <0.01             | <0.01    | <0.01    | <0.01  |
| Total Filterable Residue              | mg/L     | 300    | 500           | 390      | 1130   | 355       | 395          | 1010              | 1360     | 330      | 2520   |
| Total Hardness as CaCO <sub>3</sub>   | mg/L     | 83     | 245           | 243      | 452    | 82        | 227          | 625               | 829      | 121      | 38     |
| Zinc (Zn)                             | mg/L     | <0.01  | <0.01         | <0.01    | <0.01  | <0.01     | <0.01        | 0.01              | <0.01    | <0.01    | 0.07   |
| Isotope Analyses                      |          |        |               |          |        |           |              |                   |          |          |        |
| Tritium                               | T. units | 1.0    | <1.1          | <1.0     | 3.1    | 0.9       | <1.1         | 2.9               | 0.9      | 0.8      | <0.8   |
| Statistical significance              |          | ±0.4   | App. 0.4      | App. 0.4 | ±0.4   | ±0.4      | App. 0.4     | ±0.4              | ±0.3     | ±0.4     |        |
| Deuterium                             | %SMOW    | -90    | -94           | -90      | -83    | -93       | -85          | -84               | -95      | -84      | -95    |
| Oxygen 18                             | %SMOW    | -12.4  | -12.9         | -12.0    | -10.1  | -12.1     | -10.8        | -11.3             | -12.9    | -10.5    | -11.9  |

TABLE 2. (Contd.)

## CHEMICAL ANALYSES

## China Lake NAWS Native Spring Study

| Species Analyses                      | Units    | New House | North Mountain | Old House | Pink Hill | Ruby - west | Seep     | Stone Corral | Tennessee | Upper Tunnel |
|---------------------------------------|----------|-----------|----------------|-----------|-----------|-------------|----------|--------------|-----------|--------------|
| Aluminum (Al)                         | mg/L     | <0.05     | <0.05          | <0.05     | <0.05     | <0.05       | <0.05    | <0.05        | <0.05     | <0.05        |
| Arsenic (As)                          | mg/L     | <0.005    | <0.005         | <0.005    | 0.006     | <0.005      | 0.016    | <0.005       | <0.005    | <0.005       |
| Barium (Ba)                           | mg/L     | <0.1      | <0.1           | <0.1      | <0.1      | 0.3         | <0.1     | <0.1         | <0.1      | <0.1         |
| Bicarbonate (HCO <sub>3</sub> )       | mg/L     | 137       | 439            | 183       | 174       | 357         | 76       | 195          | 153       | 183          |
| Boron (B)                             | mg/L     | <0.1      | 0.6            | <0.1      | 0.3       | 0.3         | 0.3      | 0.2          | <0.1      | 0.1          |
| Bromide (Br)                          | mg/L     | <1        | <1             | <1        | <1        | <1          | <1       | <1           | <1        | <1           |
| Cadmium (Cd)                          | mg/L     | <0.001    | <0.001         | <0.001    | <0.001    | 0.002       | <0.001   | <0.001       | <0.001    | <0.001       |
| Calcium (Ca)                          | mg/L     | 44        | 113            | 59        | 3         | 86          | 21       | 69           | 51        | 72           |
| Carbonate (CO <sub>3</sub> )          | mg/L     | 0         | 0              | 0         | 0         | 0           | 0        | 0            | 0         | 0            |
| Chloride (Cl)                         | mg/L     | 14        | 93             | 16        | 37        | 56          | 24       | 33           | 26        | 41           |
| Copper (Cu)                           | mg/L     | <0.01     | <0.01          | <0.01     | <0.01     | <0.01       | <0.01    | <0.01        | <0.01     | <0.01        |
| Fluoride (F)                          | mg/L     | <0.1      | 0.4            | 0.1       | 0.4       | 0.2         | 0.5      | 0.6          | 0.2       | 0.6          |
| Hydroxide (OH)                        | mg/L     | 0         | 0              | 0         | 0         | 0           | 0        | 0            | 0         | 0            |
| Iron (Fe)                             | mg/L     | <0.02     | 0.04           | <0.02     | <0.02     | <0.02       | <0.02    | <0.02        | <0.02     | <0.02        |
| Lead (Pb)                             | mg/L     | <0.005    | <0.005         | <0.005    | <0.005    | <0.005      | <0.005   | <0.005       | <0.005    | <0.005       |
| Lithium (Li)                          | mg/L     | <0.01     | <0.01          | <0.01     | 0.09      | <0.01       | 0.02     | 0.01         | <0.01     | 0.02         |
| Magnesium (Mg)                        | mg/L     | 4         | 30             | 9         | <1        | 17          | 4        | 8            | 5         | 11           |
| Manganese (Mn)                        | mg/L     | <0.01     | 0.22           | <0.01     | 0.01      | 0.06        | <0.01    | <0.01        | <0.01     | <0.01        |
| Niias                                 | mg/L     | <0.05     | <0.05          | <0.05     | <0.05     | <0.05       | <0.05    | <0.05        | <0.05     | 0.05         |
| Mercury (Hg)                          | mg/L     | <0.001    | <0.001         | <0.001    | <0.001    | <0.001      | <0.001   | <0.001       | <0.001    | <0.001       |
| Nitrate (NO <sub>3</sub> )            | mg/L     | 2         | <1             | <1        | 19        | <1          | 16       | 46           | <1        | 54           |
| pH - lab                              | pH units | 8.1       | 7.7            | 8.2       | 8.1       | 7.4         | 8.1      | 8.0          | 8.0       | 7.9          |
| pH - field                            | pH units | 7.6       | 7.3            | 7.8       | 7.3       | 7.3         | 7.7      | 7.4          | 7.7       | 7.5          |
| Potassium (K)                         | mg/L     | 2         | 8              | 1         | 4         | 2           | 6        | <1           | 3         | 2            |
| Selenium (Se)                         | mg/L     | <0.005    | <0.005         | <0.005    | <0.005    | <0.005      | <0.005   | <0.005       | <0.005    | <0.005       |
| Silica (SiO <sub>2</sub> )            | mg/L     | 21        | 47             | 24        | 64        | 55          | 109      | 45           | 24        | 32           |
| Silver (Ag)                           | mg/L     | <0.01     | <0.01          | <0.01     | <0.01     | <0.01       | <0.01    | <0.01        | <0.01     | <0.01        |
| Sodium (Na)                           | mg/L     | 17        | 83             | 19        | 112       | 47          | 37       | 40           | 24        | 43           |
| Specific Conductance - lab            | µmho/cm  | 330       | 1040           | 440       | 480       | 720         | 340      | 600          | 420       | 670          |
| Specific Conductance - field          | µmho/cm  | 354       | 1128           | 443       | 520       | 157         | 346      | 614          | 427       | 667          |
| Sulfate (SO <sub>4</sub> )            | mg/L     | 35        | 110            | 54        | 39        | 19          | 44       | 61           | 51        | 76           |
| Total Alkalinity as CaCO <sub>3</sub> | mg/L     | 113       | 360            | 150       | 143       | 293         | 63       | 160          | 125       | 150          |
| Total Anions                          | me/L     | 3.40      | 12.13          | 4.58      | 5.03      | 7.84        | 3.14     | 6.17         | 4.30      | 6.63         |
| Total Cations                         | me/L     | 3.32      | 11.97          | 4.56      | 5.12      | 7.81        | 3.14     | 5.86         | 4.09      | 6.44         |
| Total Chromium (Cr)                   | mg/L     | <0.01     | <0.01          | <0.01     | <0.01     | <0.01       | <0.01    | <0.01        | <0.01     | <0.01        |
| Total Filterable Residue              | mg/L     | 210       | 750            | 275       | 355       | 450         | 305      | 395          | 260       | 415          |
| Total Hardness as CaCO <sub>3</sub>   | mg/L     | 127       | 408            | 185       | 8         | 286         | 69       | 206          | 148       | 226          |
| Zinc (Zn)                             | mg/L     | 0.04      | <0.01          | <0.01     | <0.01     | <0.01       | <0.01    | <0.01        | <0.01     | 0.030        |
| Isotope Analyses                      |          |           |                |           |           |             |          |              |           |              |
| Tritium                               | T. units | <0.7      | 1.4            | <1.3      | <0.7      | <1.4        | <1.1     | <1.8         | <1.1      | 0.9          |
| Statistical significance              |          |           | ±0.3           | App. 0.6  |           | App. 0.6    | App. 0.4 | App. 0.9     | App. 0.5  | ±0.4         |
| Deuterium                             | %SMOW    | -97       | -85            | -92       | -89       | -88         | -86      | -82          | -97       | -76          |
| Oxygen 18                             | %SMOW    | -13.3     | -11.9          | -13.0     | -11.8     | -12.3       | -11.6    | -11.2        | -13.6     | -8.9         |

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TABLE 2. (Contd.)

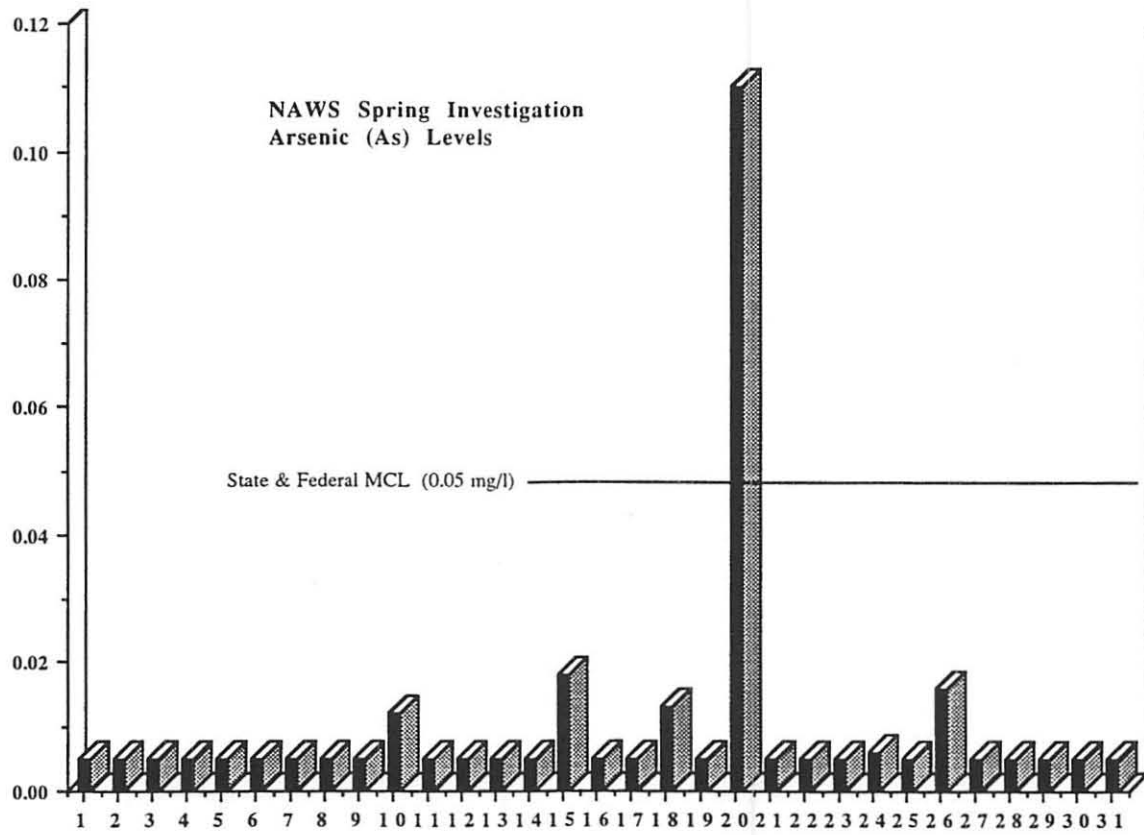
China Lake NAWS Native Spring Study

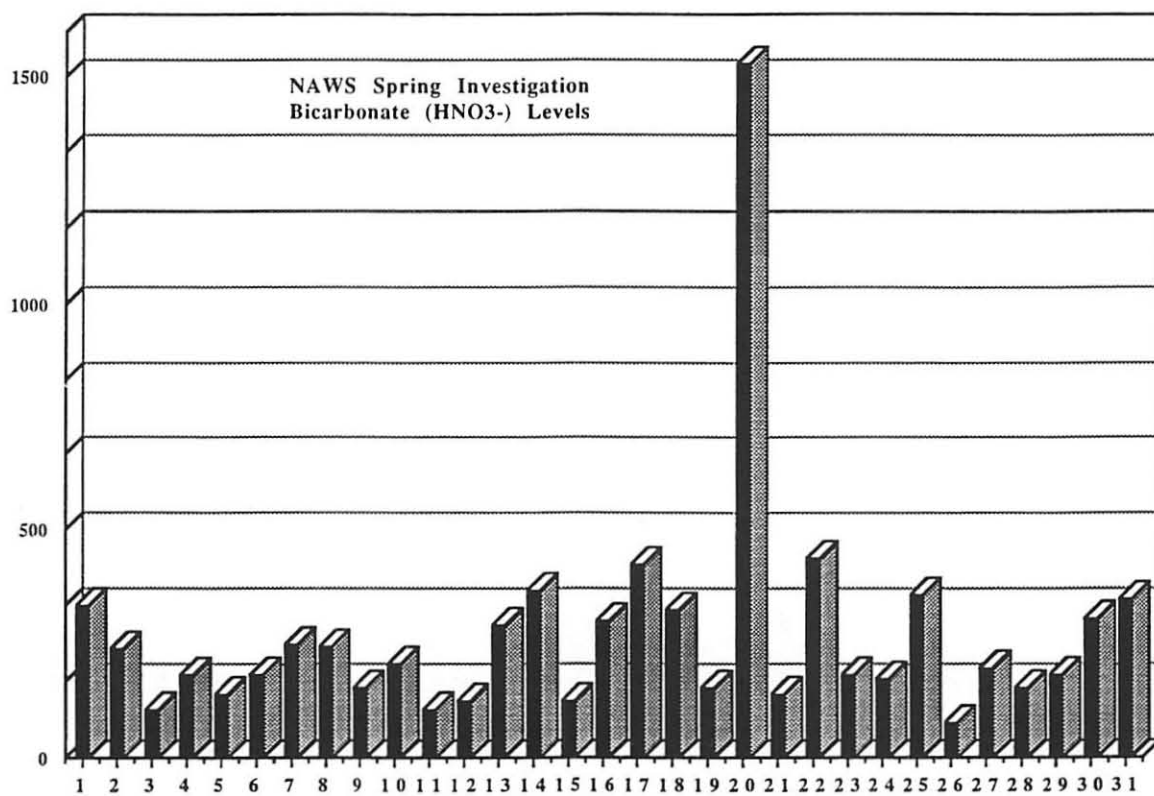
## CHEMICAL ANALYSES

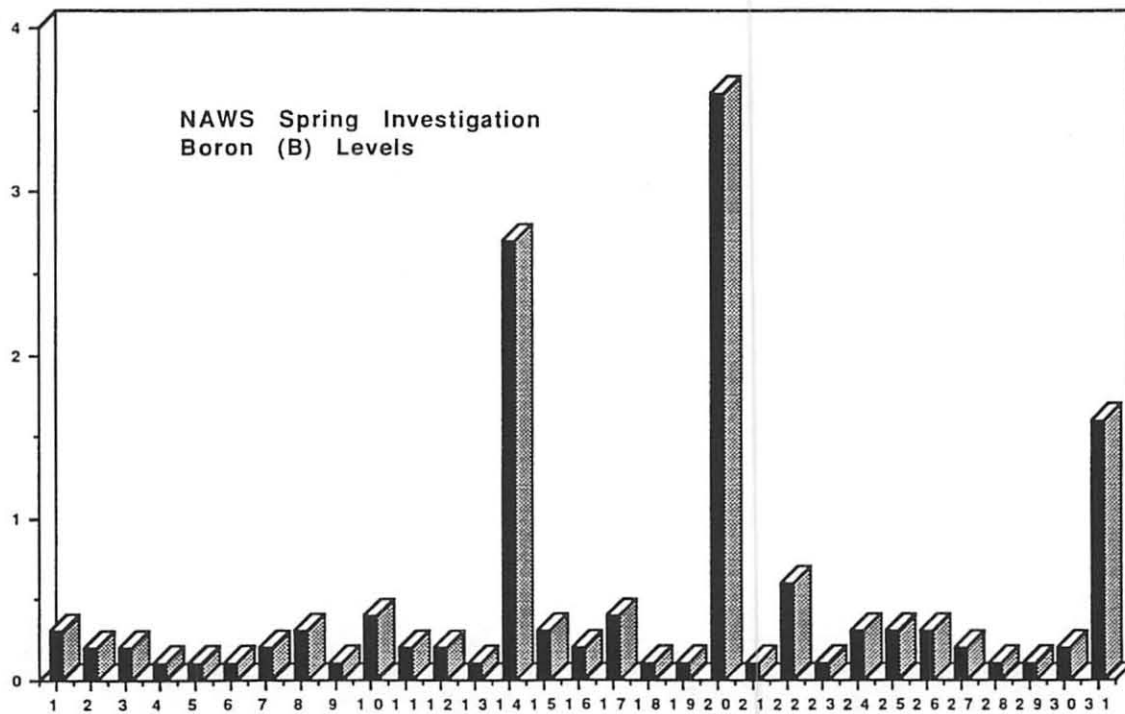
| Species Analyses                      | Units    | Wildrose Mine | Wilson |
|---------------------------------------|----------|---------------|--------|
| Aluminum (Al)                         | mg/L     | <0.05         | <0.05  |
| Arsenic (As)                          | mg/L     | <0.005        | <0.005 |
| Barium (Ba)                           | mg/L     | <0.1          | <0.1   |
| Bicarbonate (HCO <sub>3</sub> )       | mg/L     | 305           | 348    |
| Boron (B)                             | mg/L     | 0.2           | 1.6    |
| Bromide (Br)                          | mg/L     | <1            | <1     |
| Cadmium (Cd)                          | mg/L     | <0.001        | <0.001 |
| Calcium (Ca)                          | mg/L     | 78            | 112    |
| Carbonate (CO <sub>3</sub> )          | mg/L     | 0             | 0      |
| Chloride (Cl)                         | mg/L     | 42            | 260    |
| Copper (Cu)                           | mg/L     | <0.01         | <0.01  |
| Fluoride (F)                          | mg/L     | 0.3           | 0.6    |
| Hydroxide (OH)                        | mg/L     | 0             | 0      |
| Iron (Fe)                             | mg/L     | <0.02         | <0.02  |
| Lead (Pb)                             | mg/L     | <0.005        | <0.005 |
| Lithium (Li)                          | mg/L     | <0.01         | <0.01  |
| Magnesium (Mg)                        | mg/L     | 18            | 43     |
| Manganese (Mn)                        | mg/L     | 0.02          | <0.01  |
| NIBAS                                 | mg/L     | <0.05         | <0.05  |
| Mercury (Hg)                          | mg/L     | <0.001        | <0.001 |
| Nitrate (NO <sub>3</sub> )            | mg/L     | 2             | 4      |
| pH - lab                              | pH units | 7.9           | 8.1    |
| pH - field                            | pH units | 7.3           | 8.0    |
| Potassium (K)                         | mg/L     | 2             | 6      |
| Selenium (Se)                         | mg/L     | <0.005        | <0.005 |
| Silica (SiO <sub>2</sub> )            | mg/L     | 36            | 49     |
| Silver (Ag)                           | mg/L     | <0.01         | <0.01  |
| Sodium (Na)                           | mg/L     | 35            | 160    |
| Specific Conductance - lab            | µmho/cm  | 520           | 1450   |
| Specific Conductance - field          | µmho/cm  | 670           | 1600   |
| Sulfate (SO <sub>4</sub> )            | mg/L     | 43            | 160    |
| Total Alkalinity as CaCO <sub>3</sub> | mg/L     | 250           | 285    |
| Total Anions                          | me/L     | 7.13          | 16.44  |
| Total Cations                         | me/L     | 6.97          | 16.28  |
| Total Chromium (Cr)                   | mg/L     | <0.01         | <0.01  |
| Total Filterable Residue              | mg/L     | 385           | 1080   |
| Total Hardness as CaCO <sub>3</sub>   | mg/L     | 270           | 459    |
| Zinc (Zn)                             | mg/L     | <0.01         | <0.01  |
| Isotope Analyses                      |          |               |        |
| Tridium                               | T. units | 1.7           | 1.8    |
|                                       |          | ±0.5          | ±0.4   |
| Deuterium                             | ‰SMOW    | -92           | -85    |
| Oxygen 18                             | ‰SMOW    | -12.5         | -10.7  |

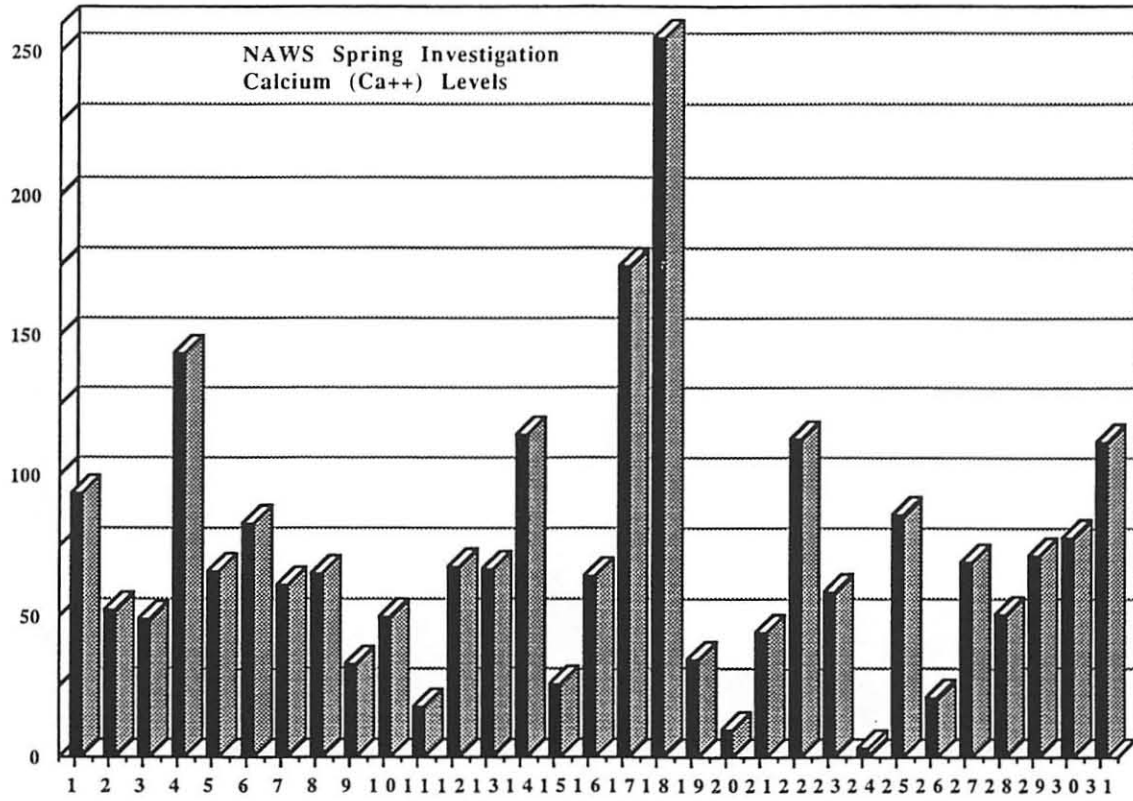
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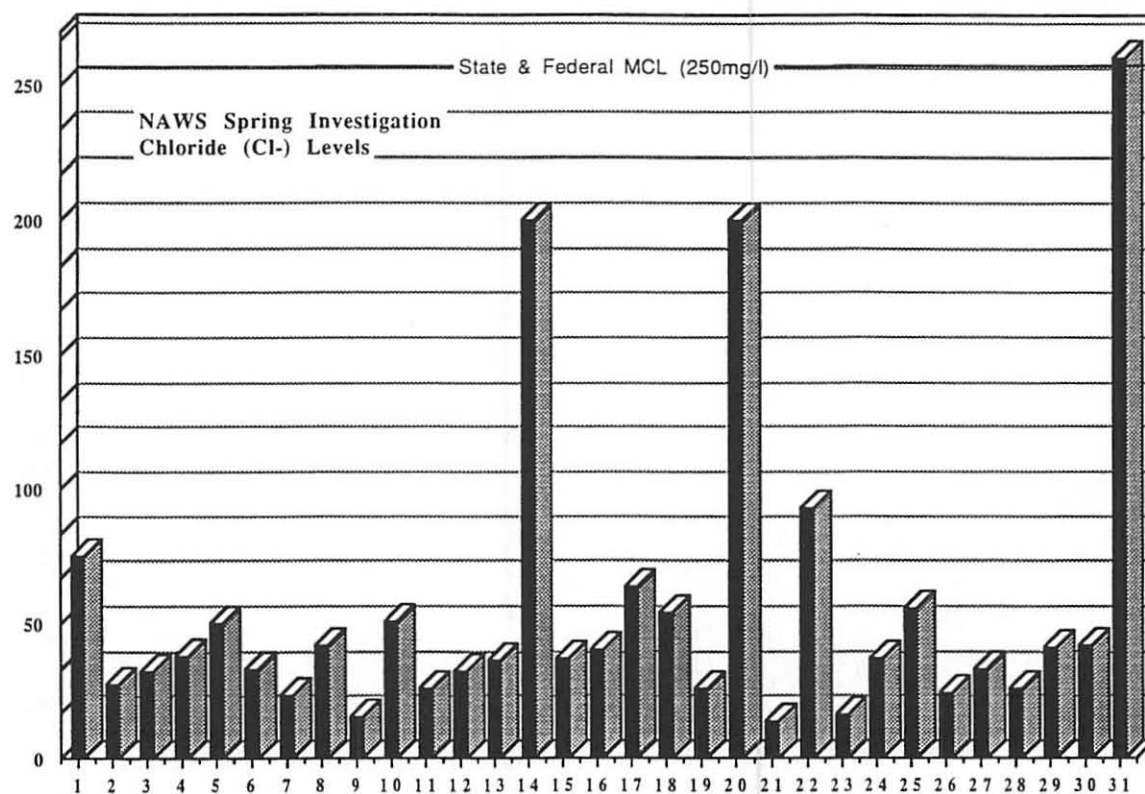
Appendix A  
WATER CHEMISTRY GRAPHICS

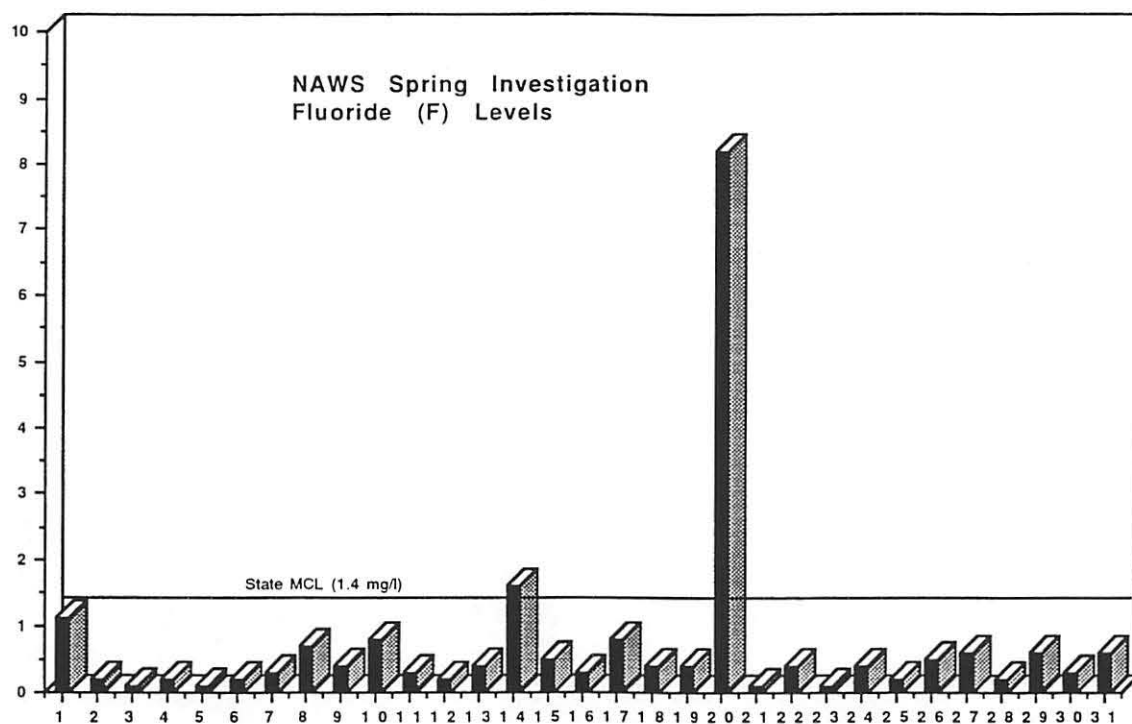


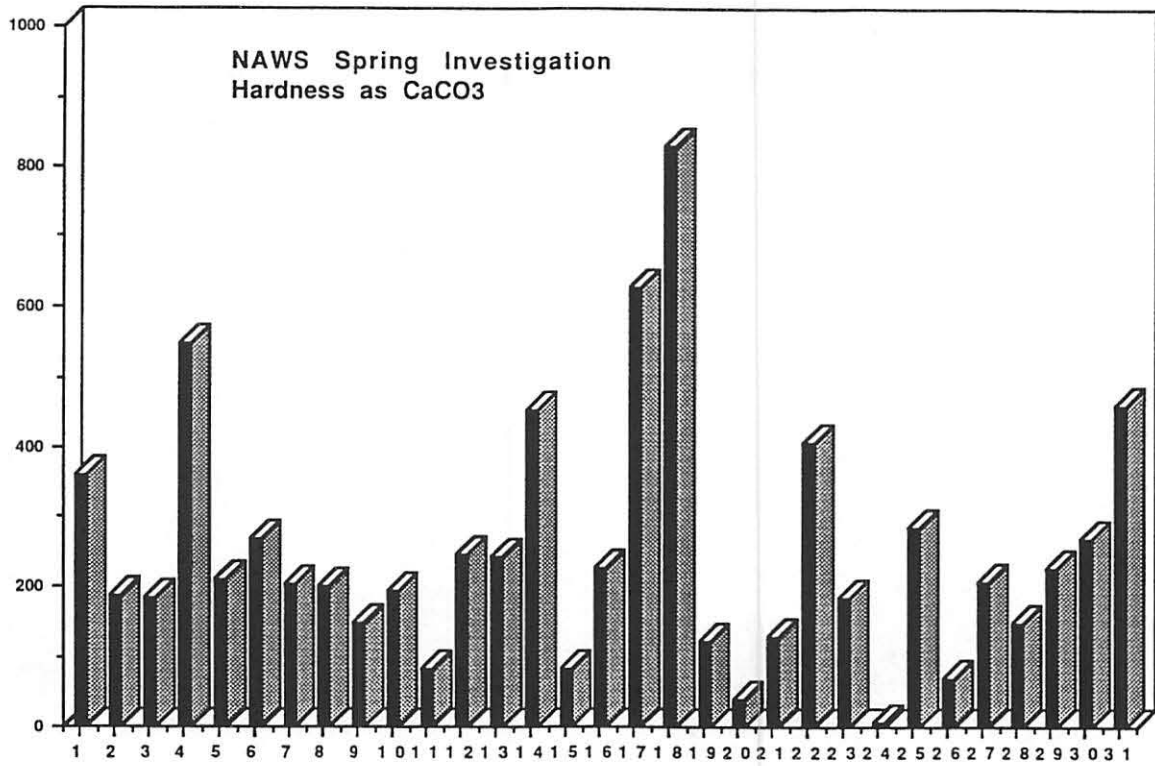


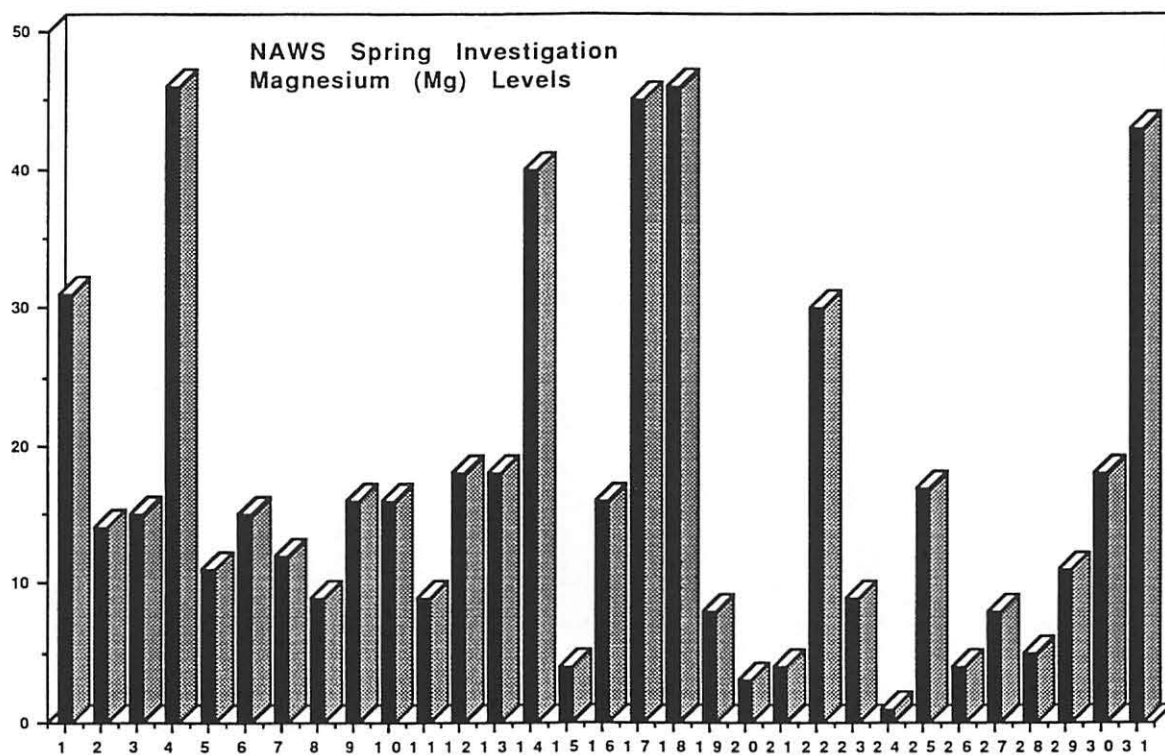


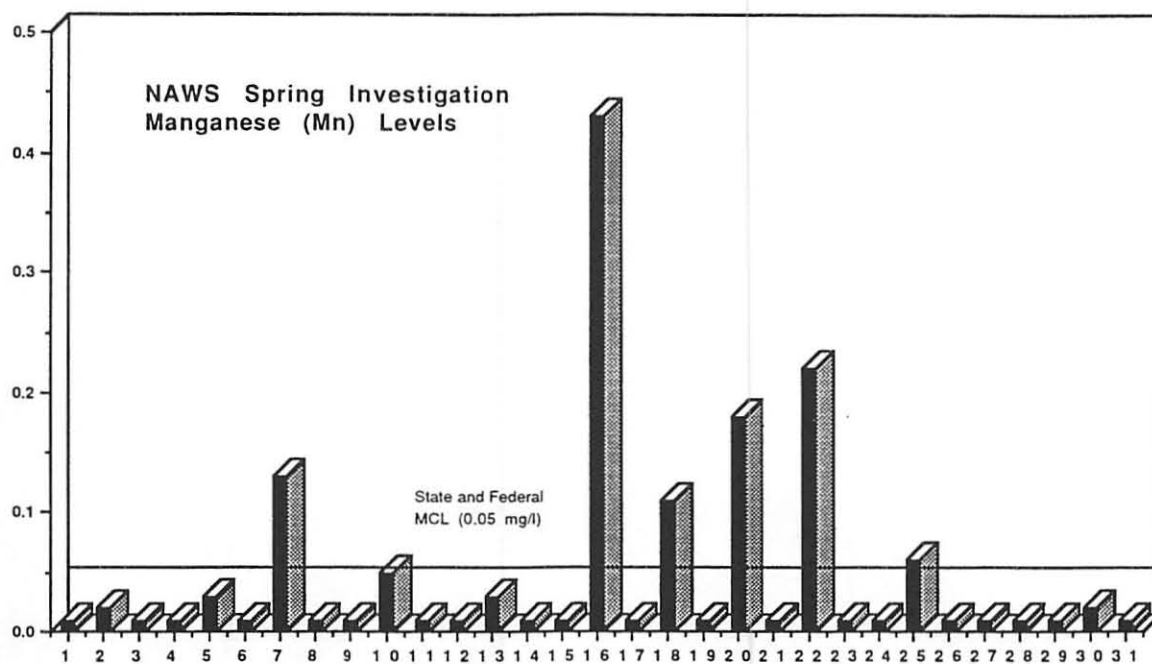


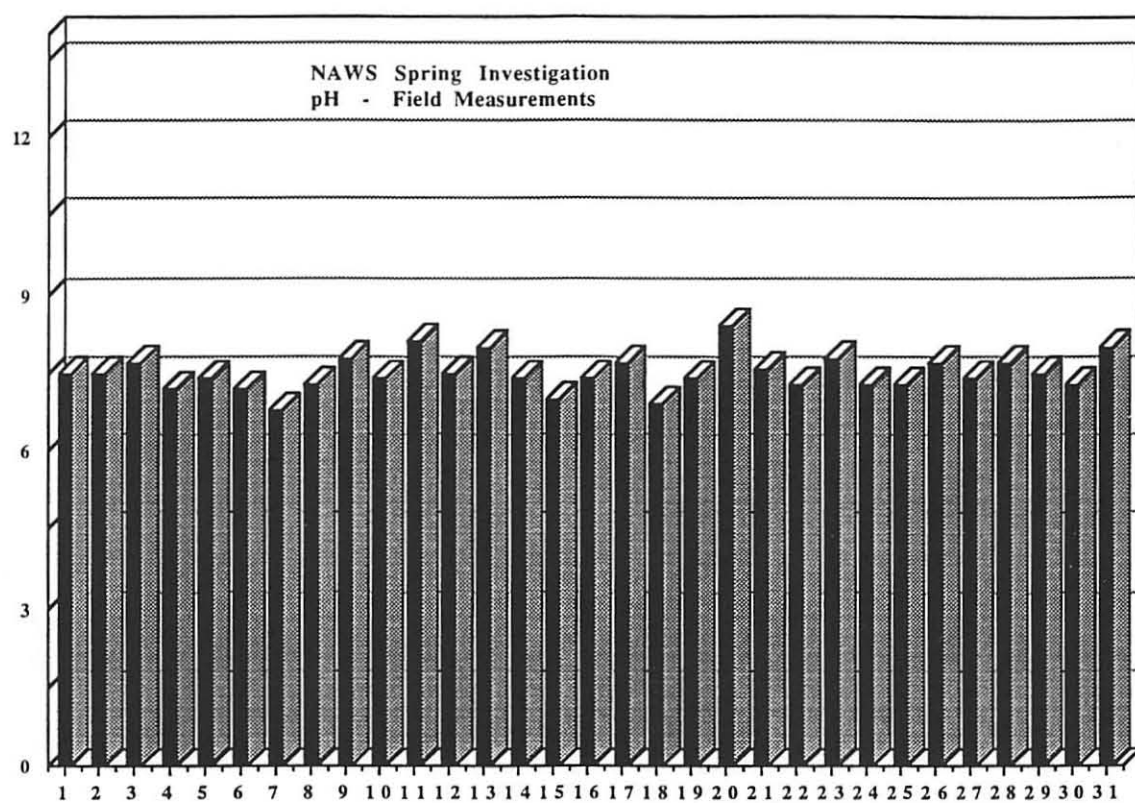


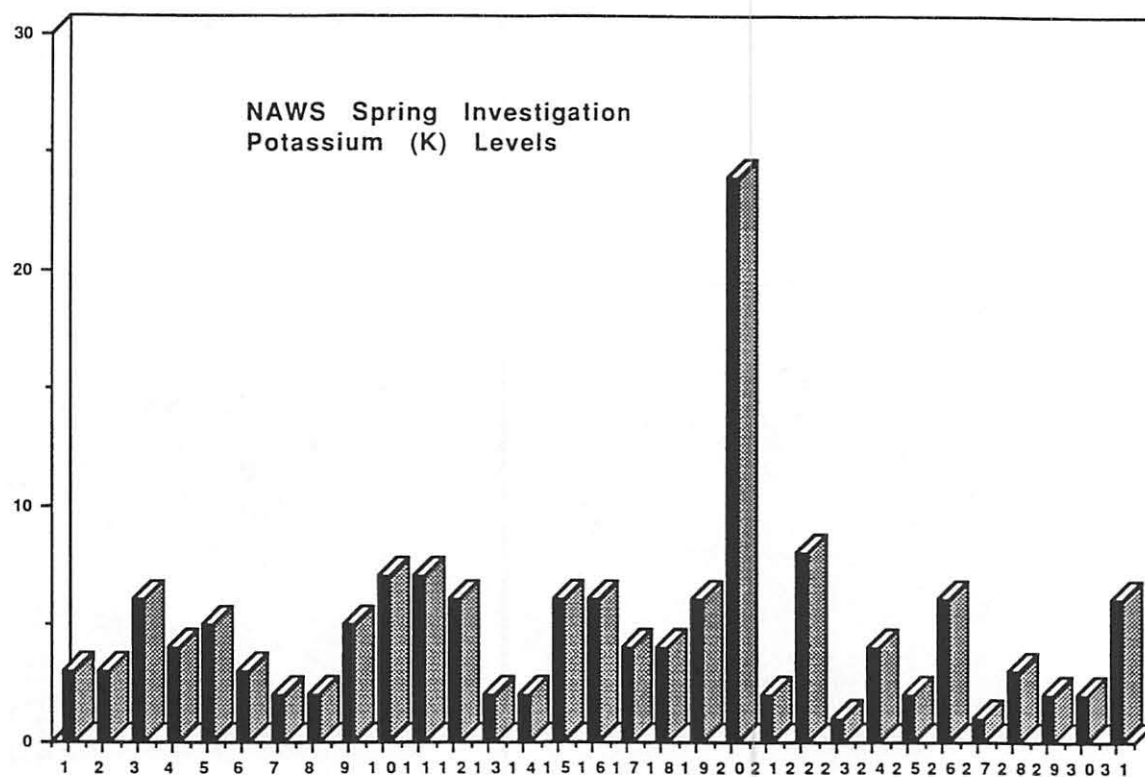


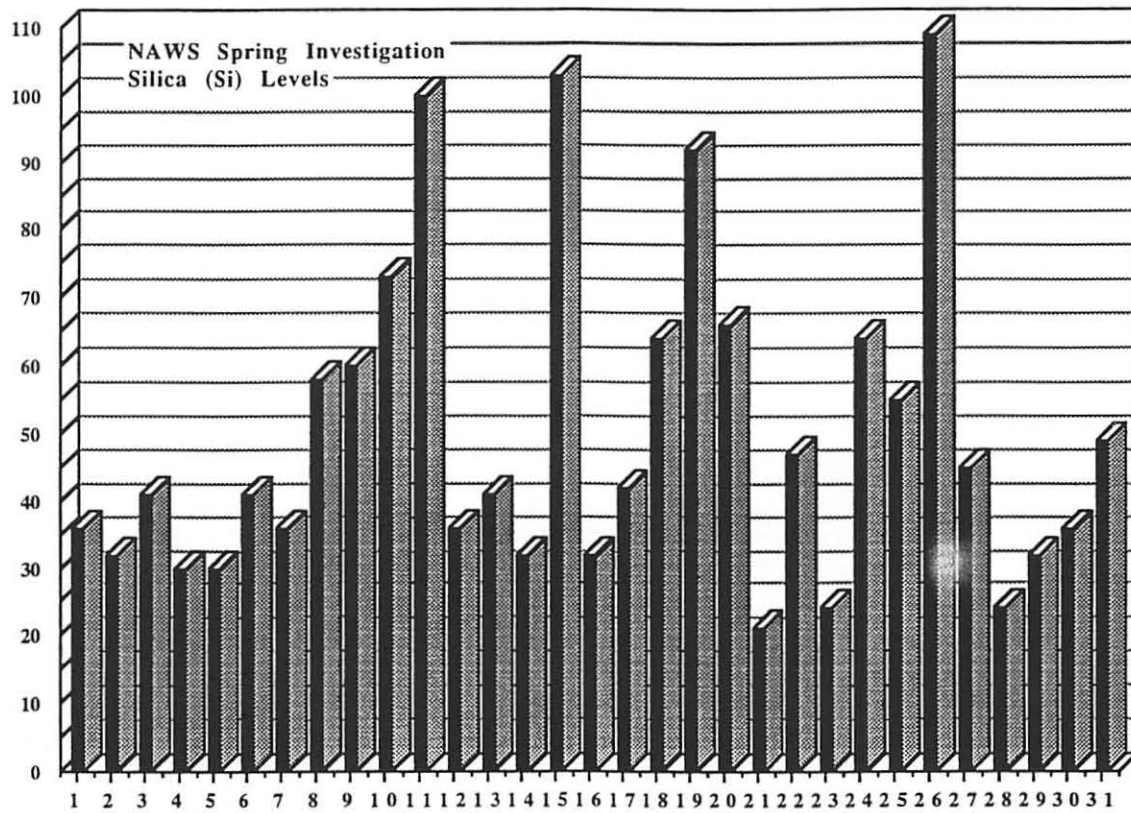


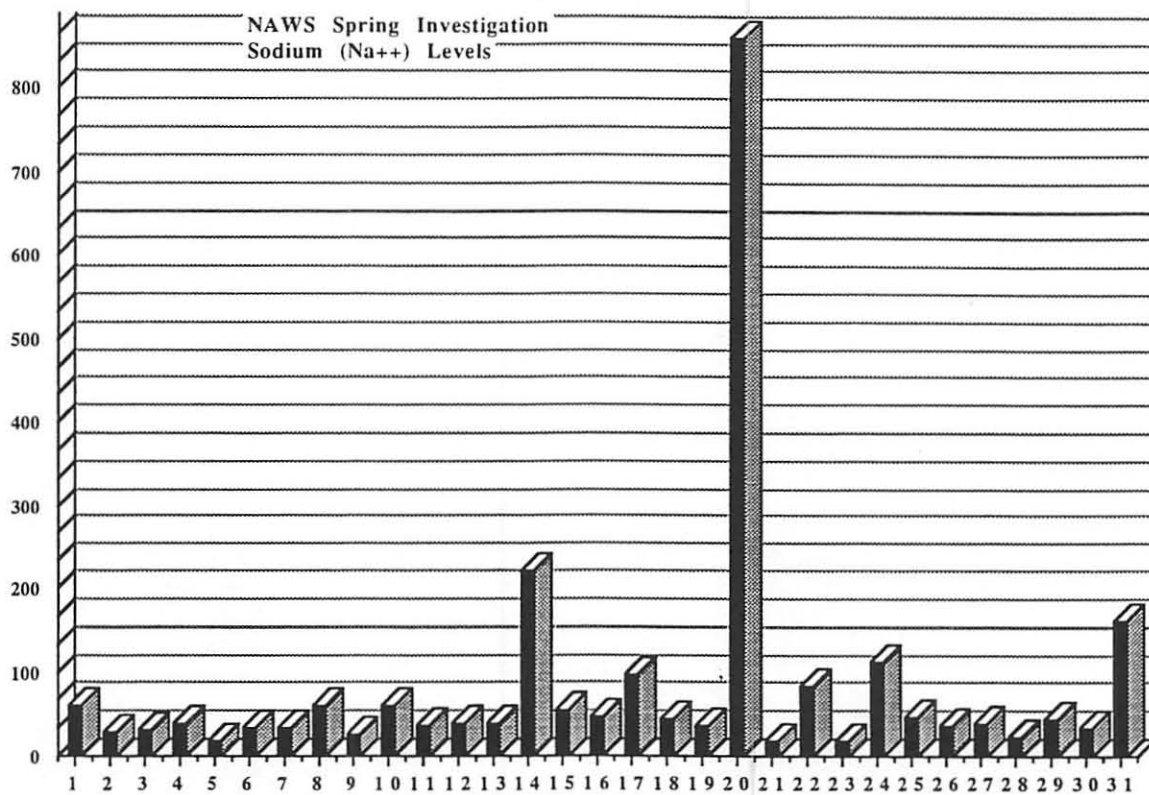


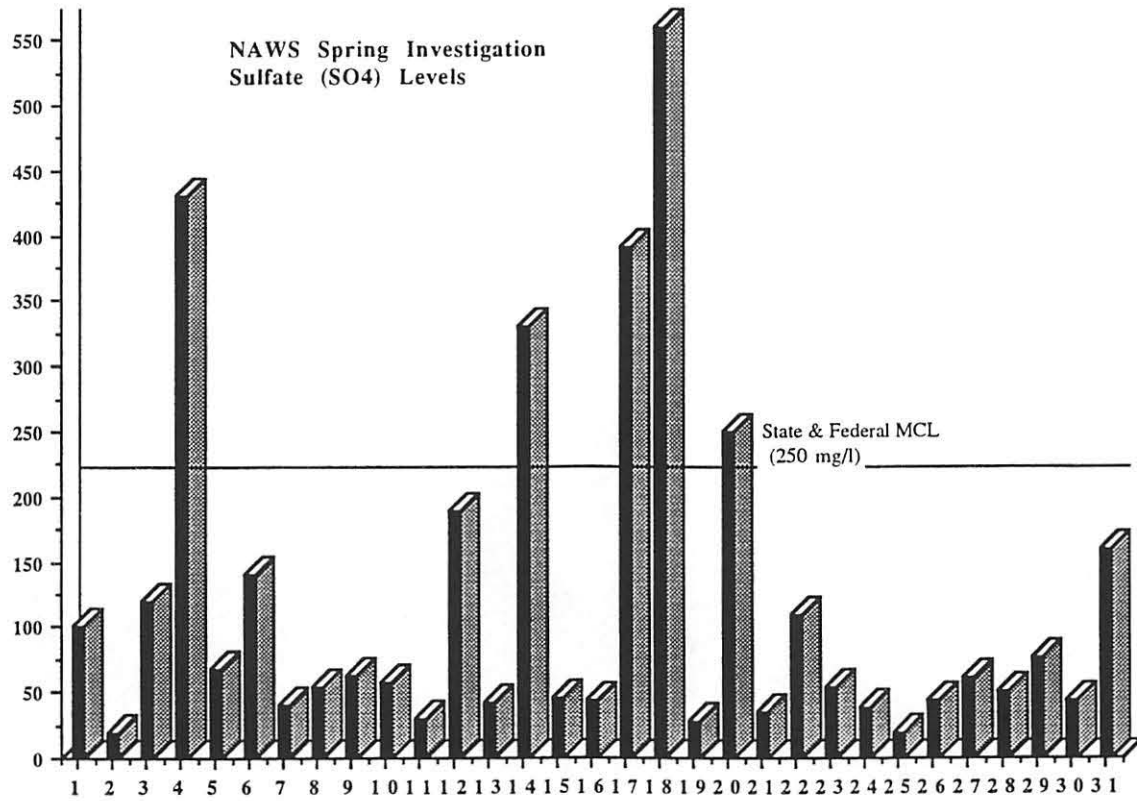


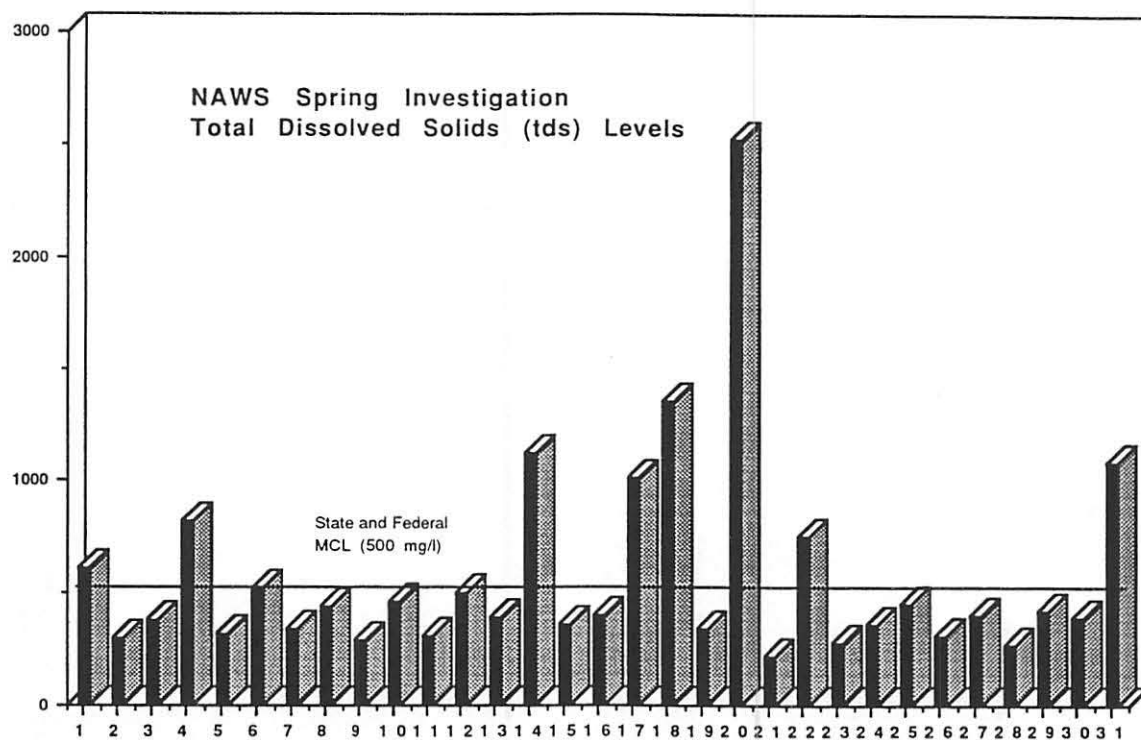


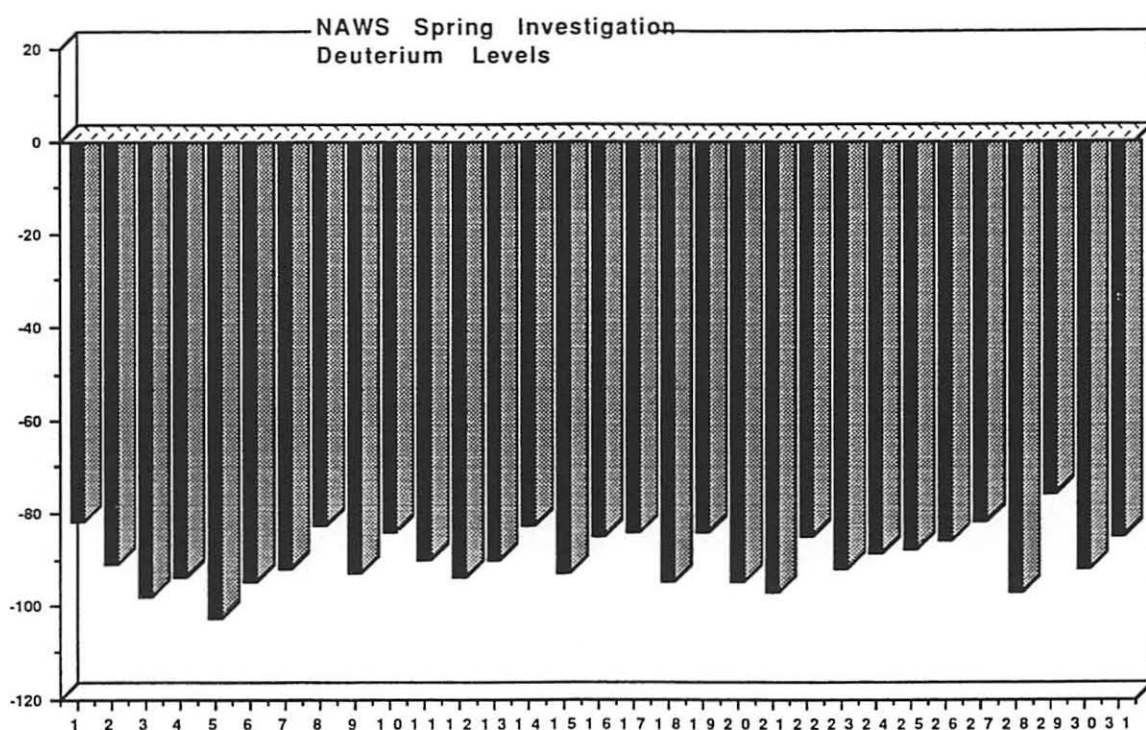


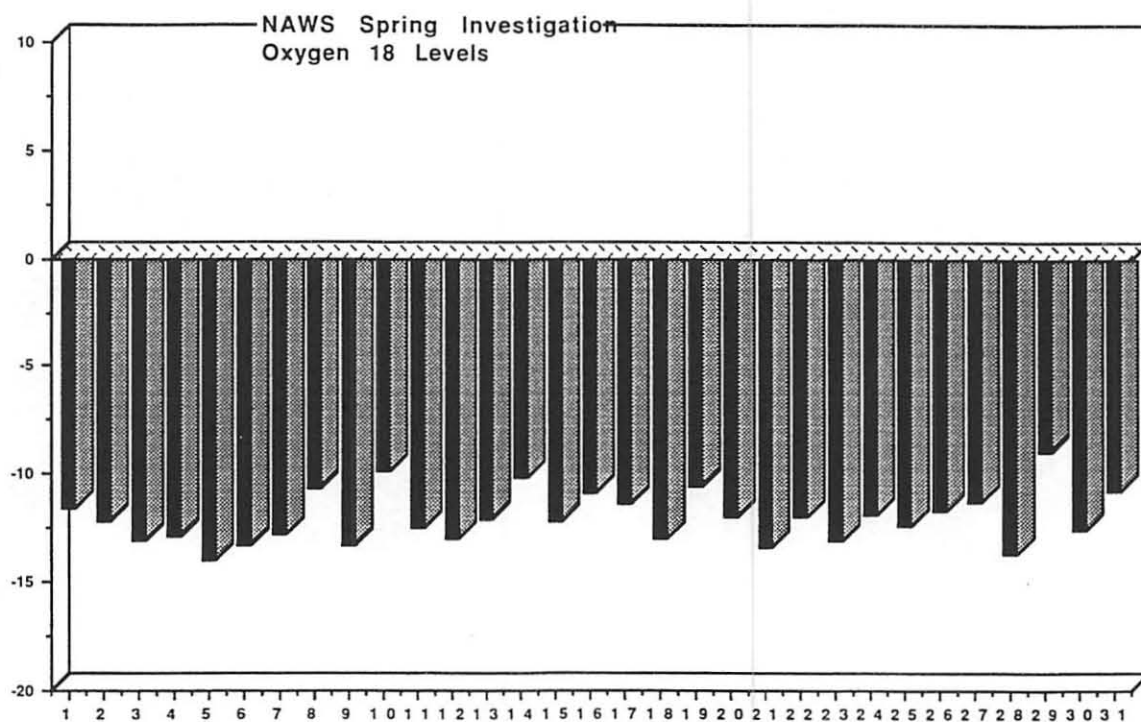


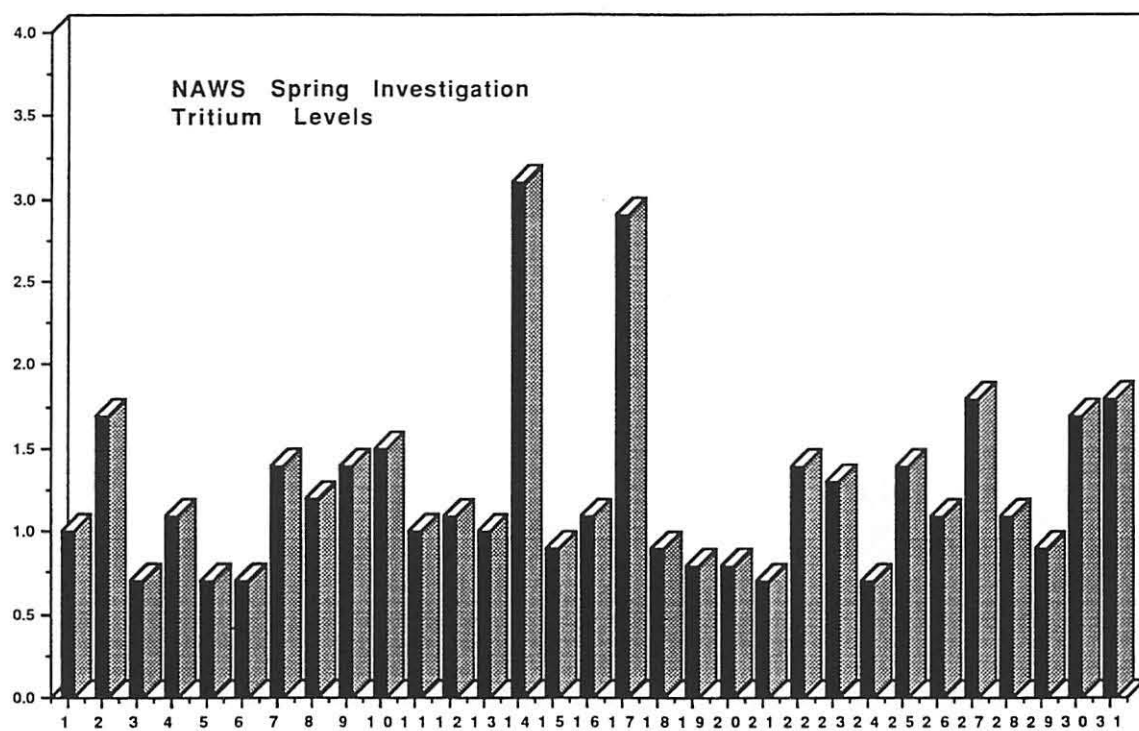




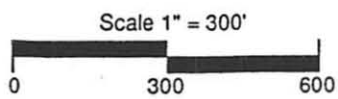
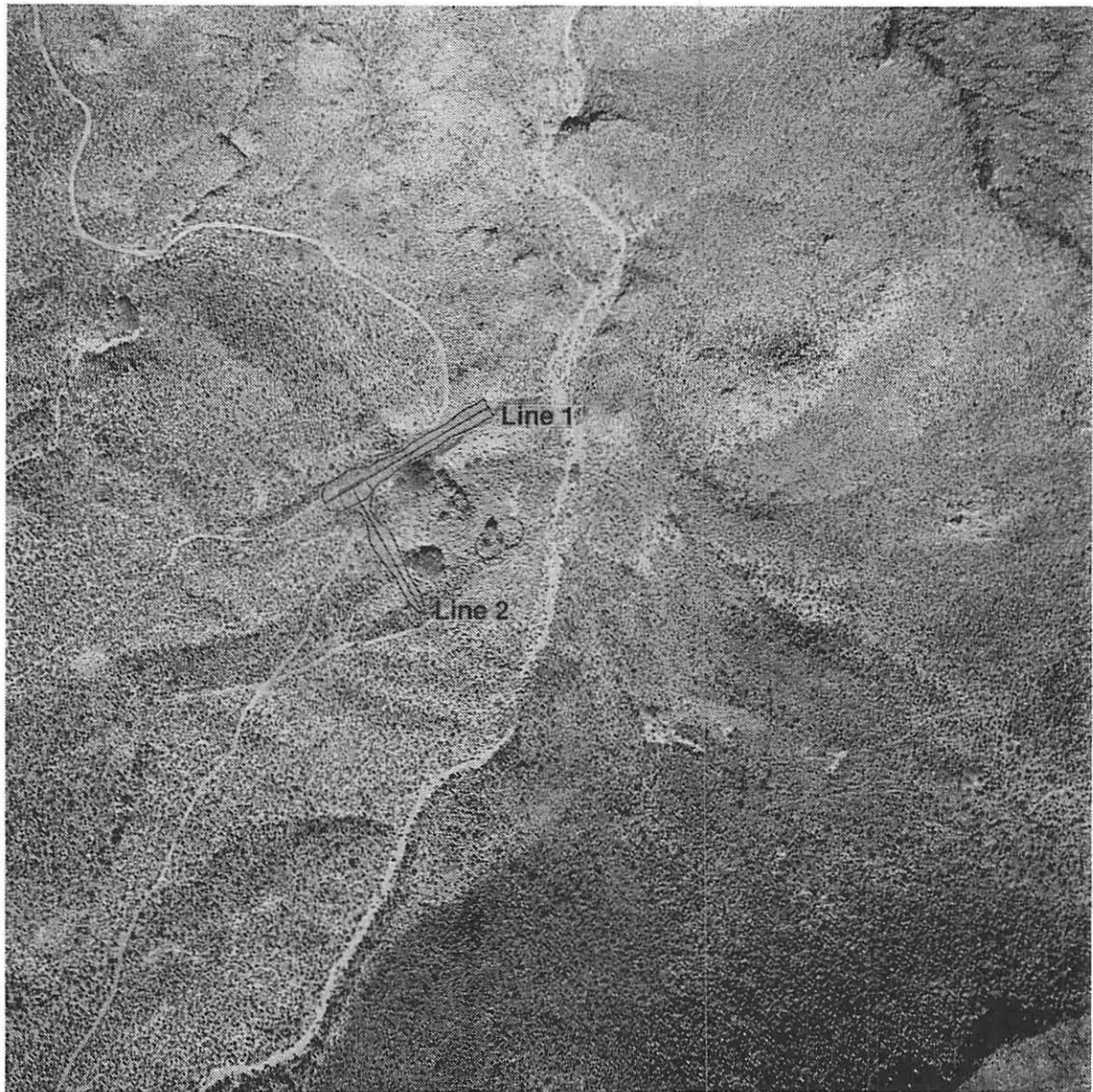






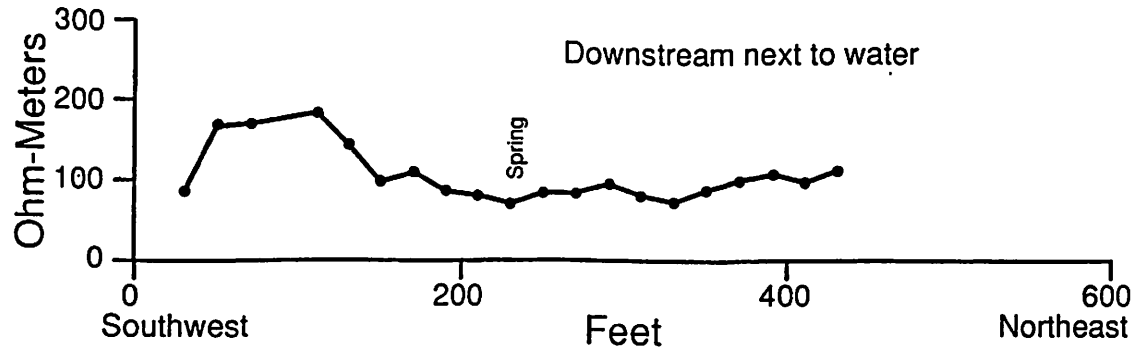


**Appendix B**  
**SPRING RESISTIVITY SURVEYS**

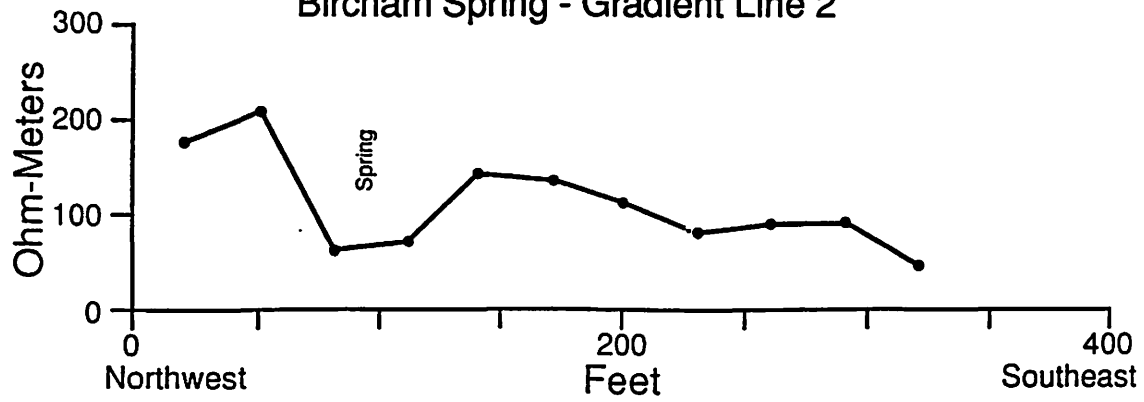


Bircham Spring — Electrical Resistivity Profiles.

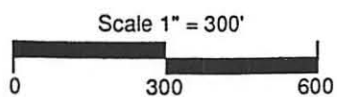
### Bircham Spring - Gradient Line 1



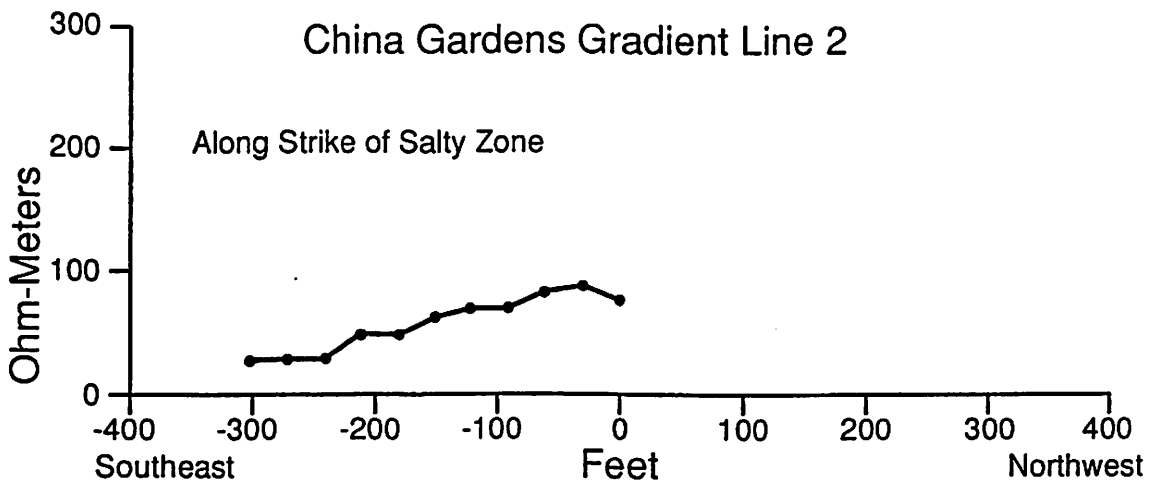
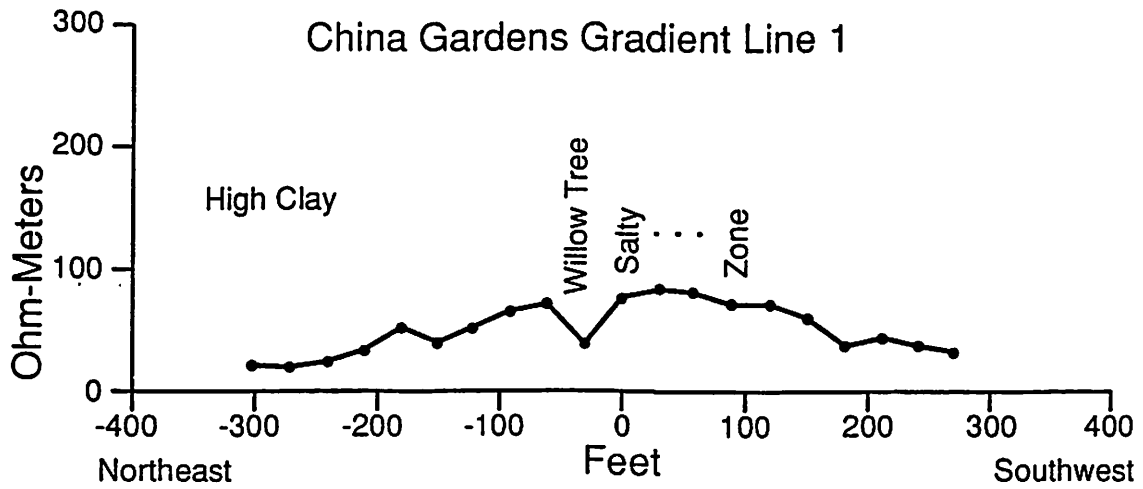
### Bircham Spring - Gradient Line 2



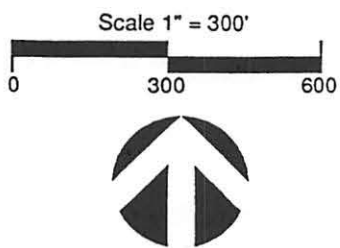
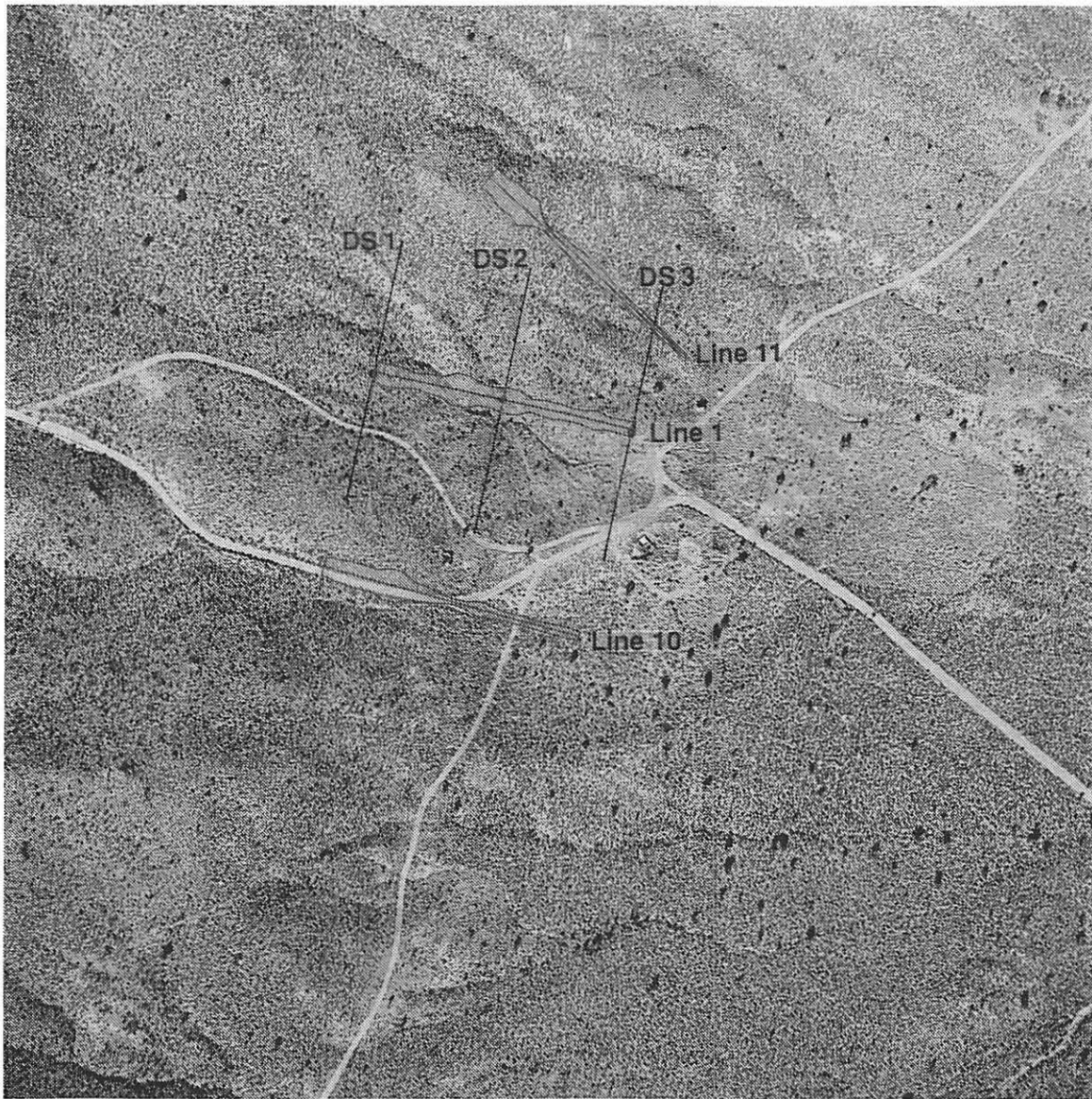
Bircham Spring — Electrical Resistivity Profiles.



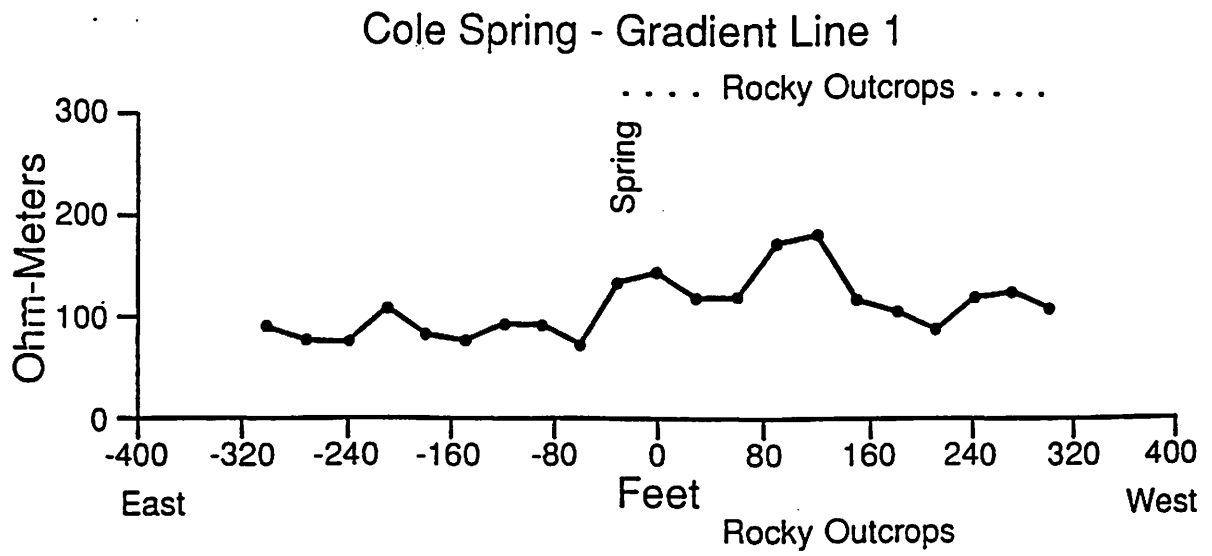
China Garden Spring — Electrical Resistivity Profiles.



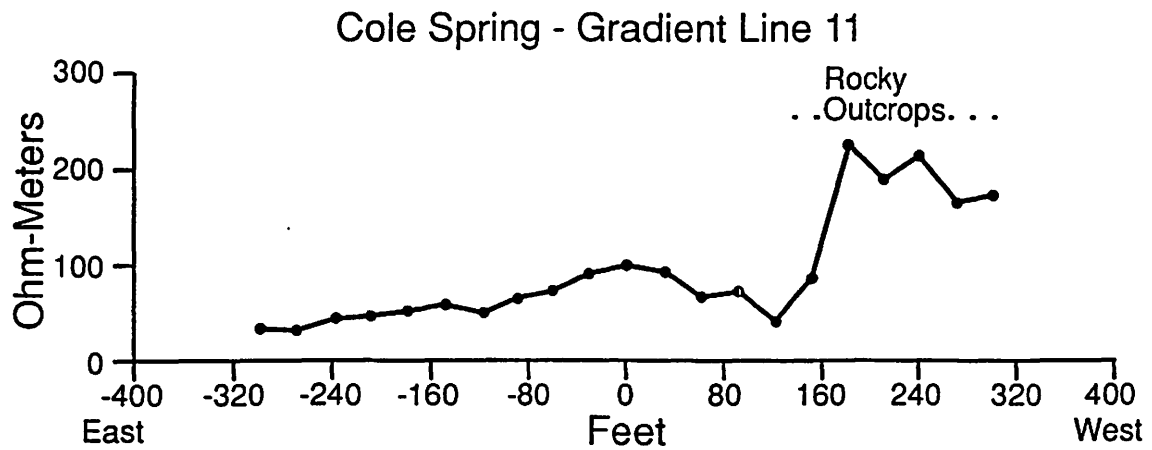
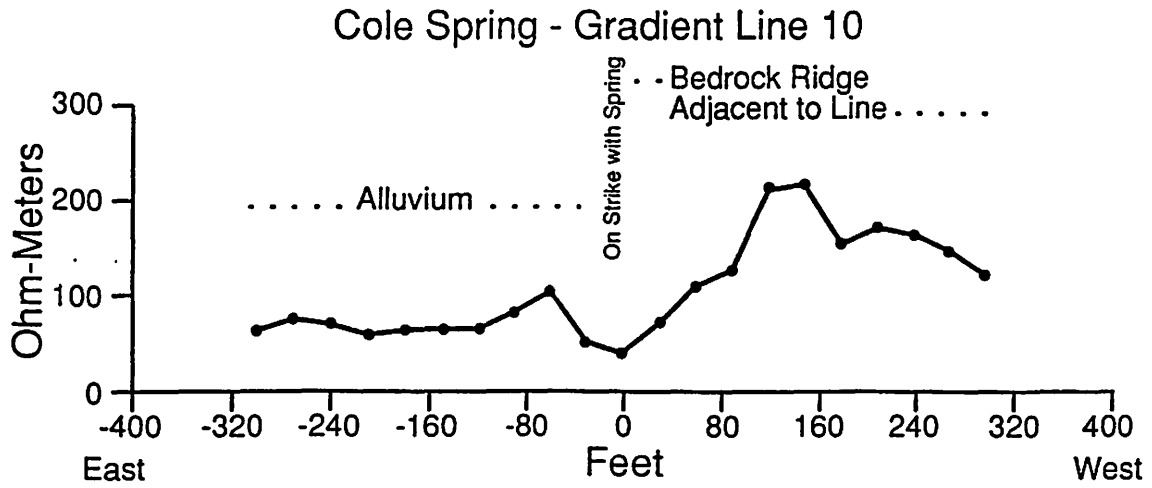
China Garden Spring — Electrical Resistivity Profiles.



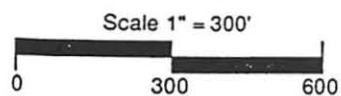
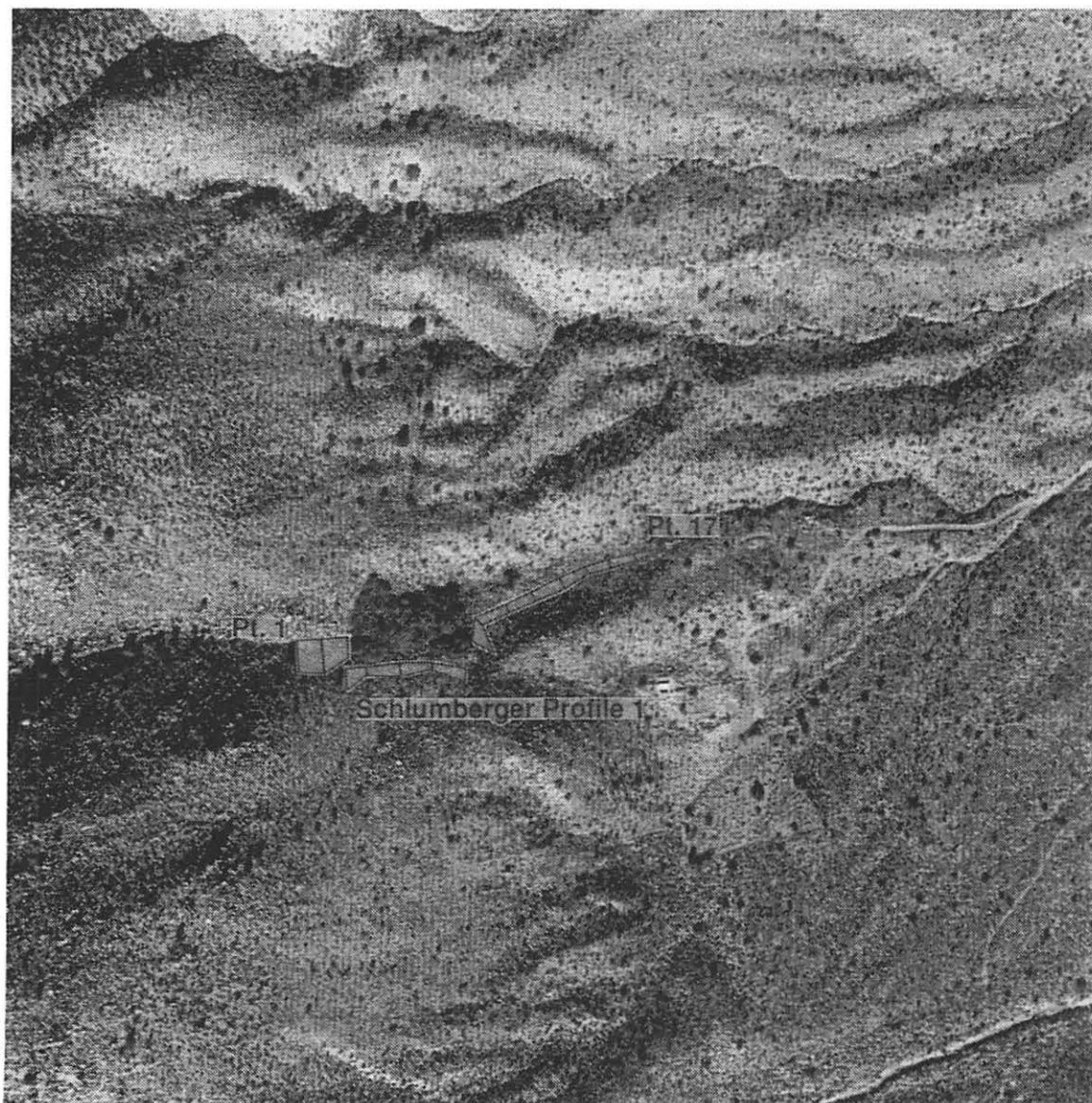
Cole Spring — Electrical Resistivity Profiles.



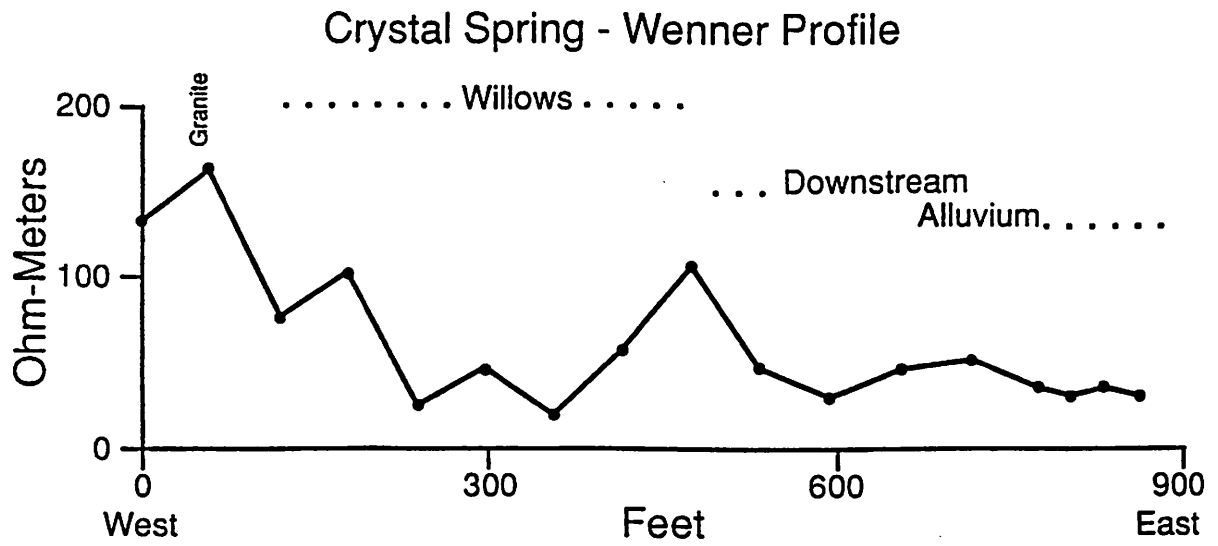
Cole Spring — Electrical Resistivity Profiles.



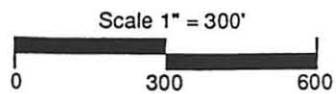
Cole Spring — Electrical Resistivity Profiles.



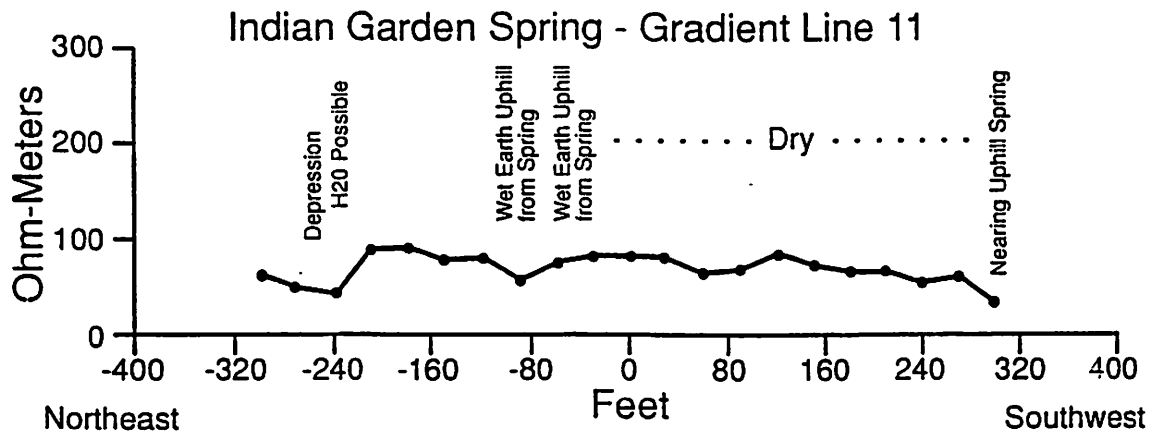
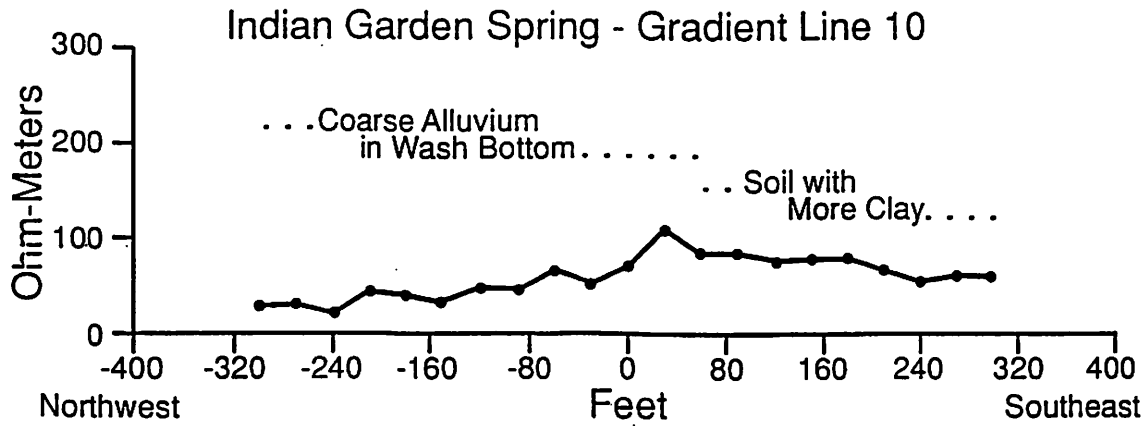
Crystal Spring — Electrical Resistivity Profiles.



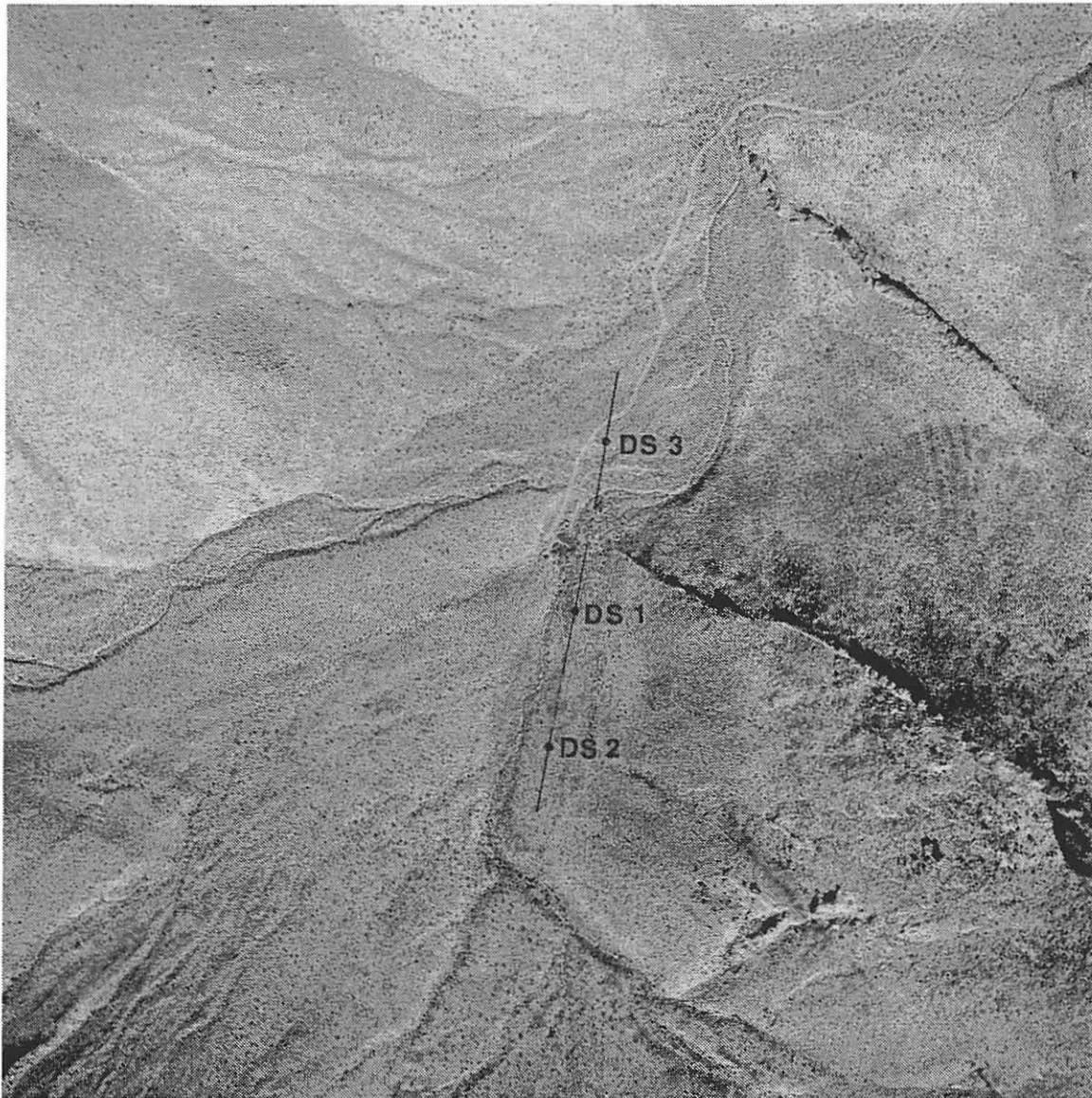
Crystal Spring — Electrical Resistivity Profiles.



Indian Garden Spring — Electrical Resistivity Profiles.



Indian Garden Spring — Electrical Resistivity Profiles.

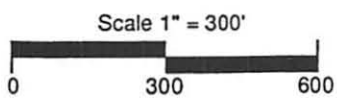


Scale 1" = 300'

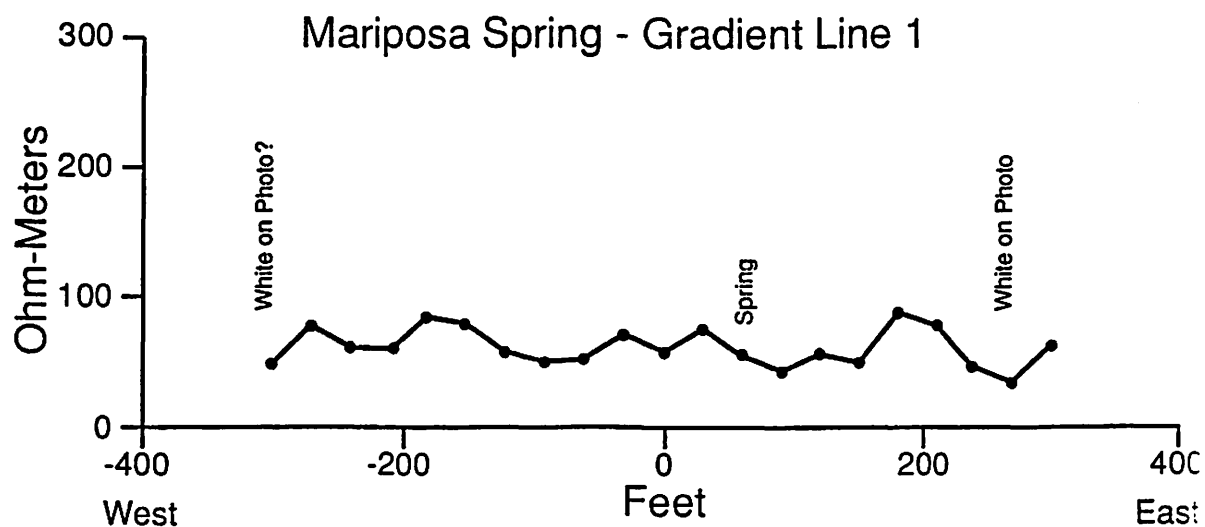
0 300 600



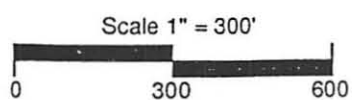
Lead Pipe Spring — Electrical Resistivity Profiles.



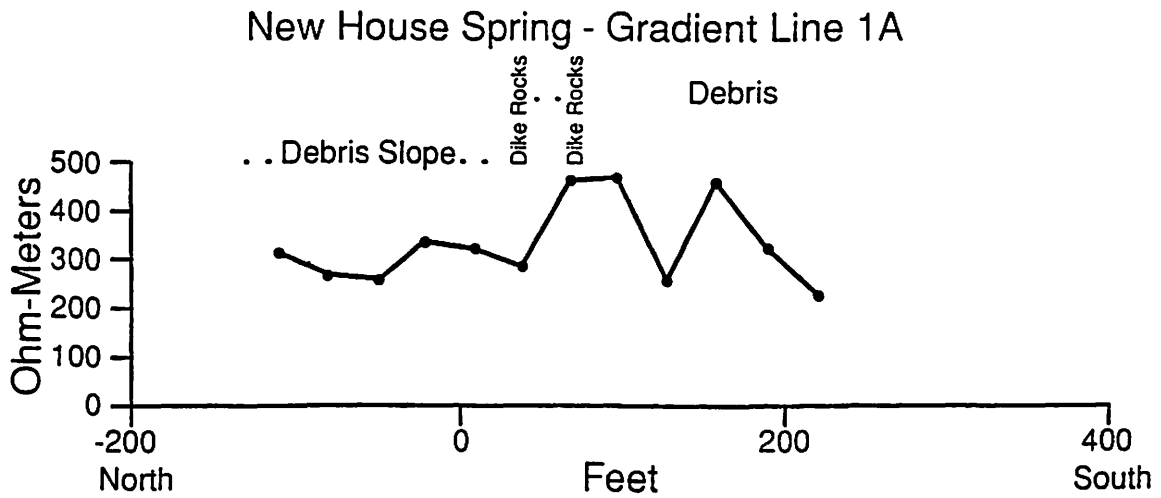
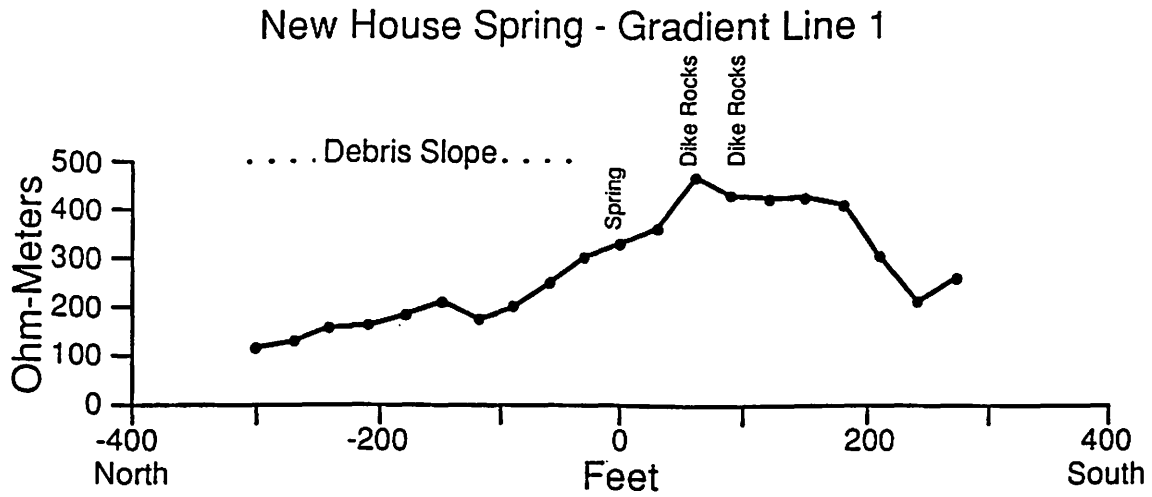
Mariposa Spring — Electrical Resistivity Profiles.



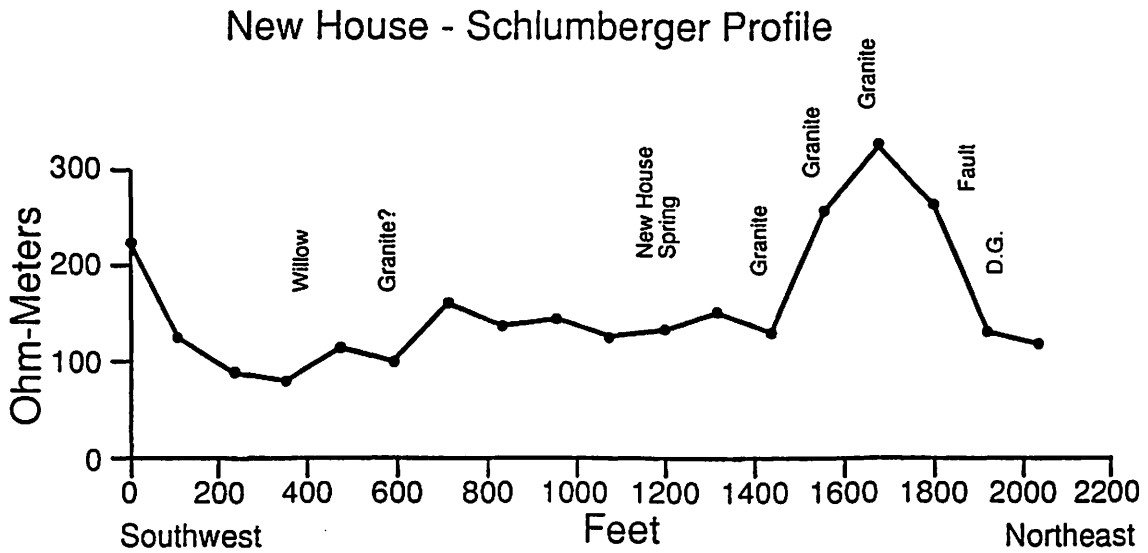
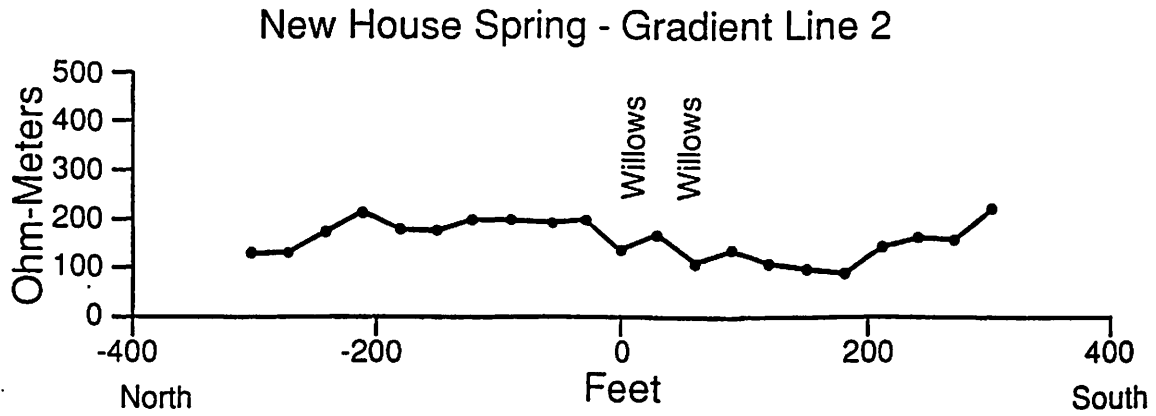
Mariposa Spring — Electrical Resistivity Profiles.



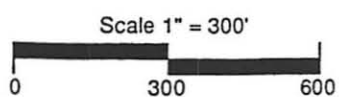
New House Spring — Electrical Resistivity Profiles.



New House Spring — Electrical Resistivity Profiles.

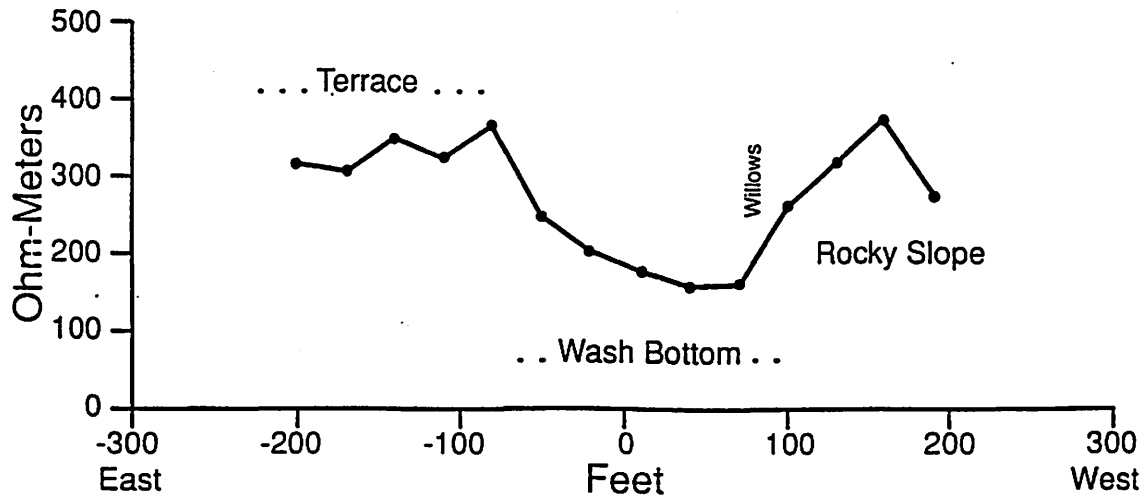


New House Spring — Electrical Resistivity Profiles.

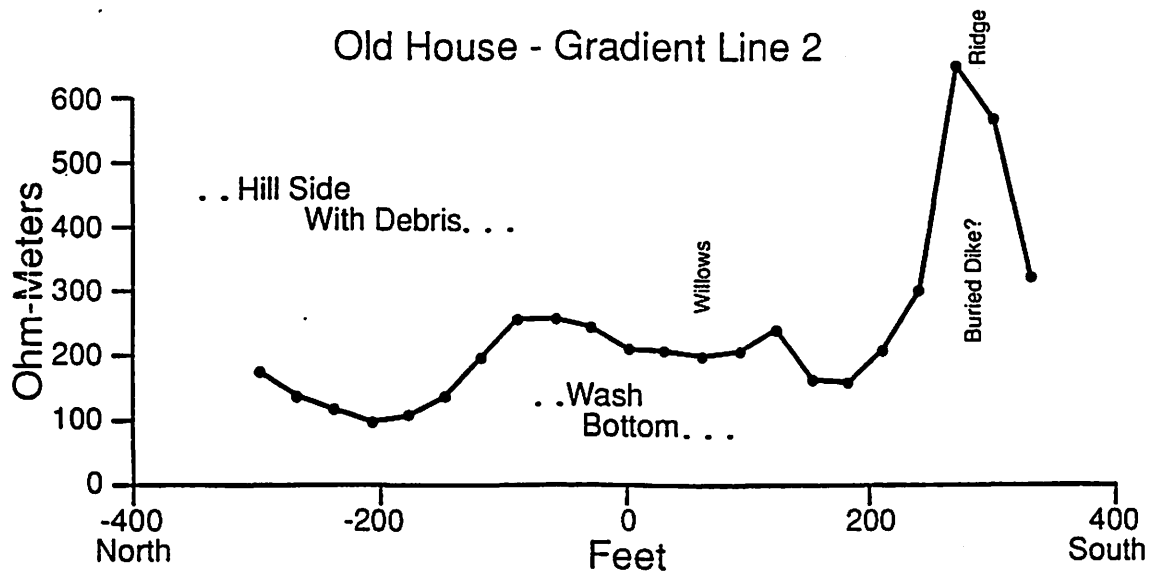


Old House Spring — Electrical Resistivity Profiles.

Old House - Gradient Line 1

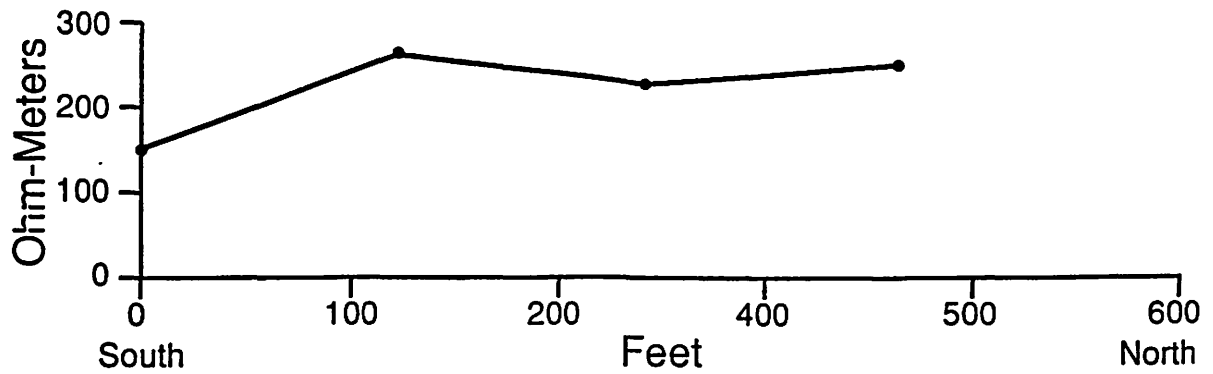


Old House - Gradient Line 2

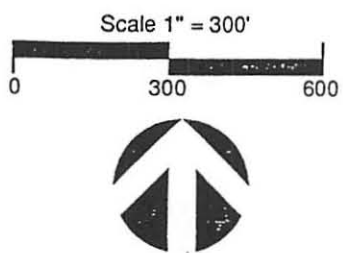
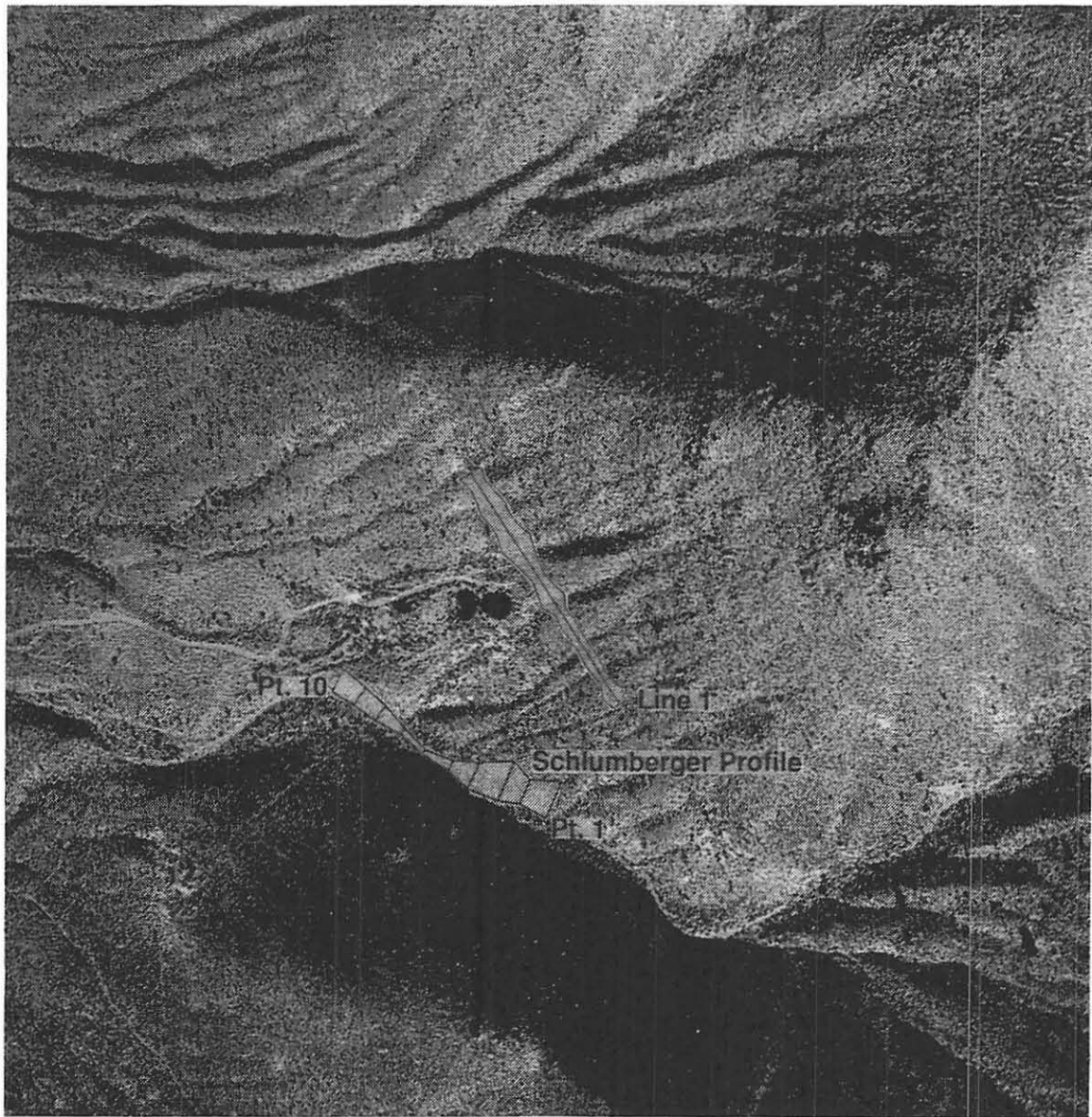


Old House Spring — Electrical Resistivity Profiles.

### Old House Spring - Schlumberger Profile

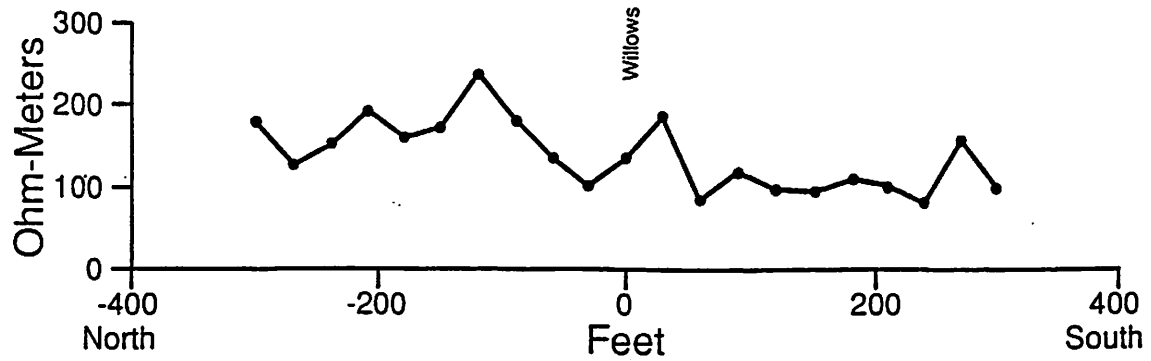


Old House Spring — Electrical Resistivity Profiles.

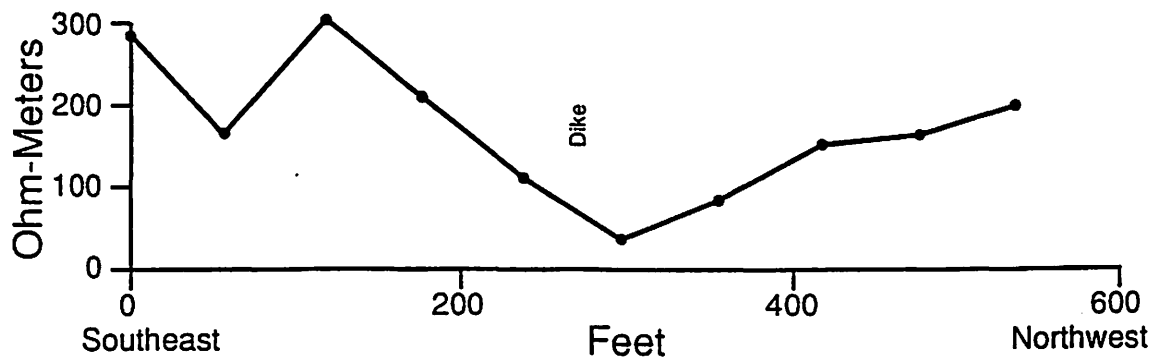


Tennessee Spring — Electrical Resistivity Profiles.

Tennessee Spring - Gradient Line 1



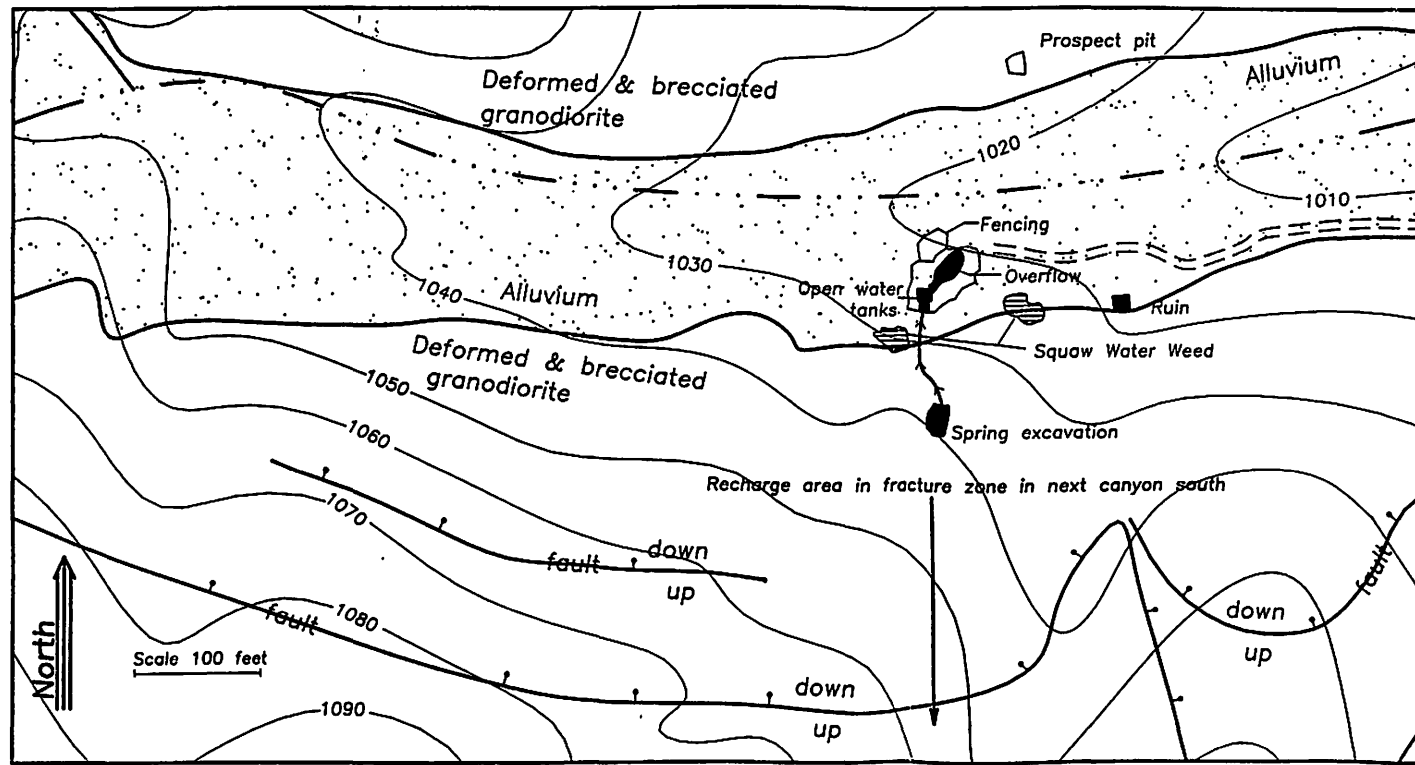
Tennessee Spring - Wenner Line 1



Tennessee Spring — Electrical Resistivity Profiles.

Appendix C  
GEOLOGIC MAPS

## AMITY



T. W. Blighorn, Earth Sciences Consultants

## Legend

- 5640 — Ground contour
- == == == Dirt Road
- granodiorite  
alluvium Geologic Contact
- . - . - Intermittent stream
- . - . - Fault plane dipping toward symbols

- Flowing surface water or pipe
- Resistivity profile showing curve of resistivity
- Squaw Water Weed (*Baccharis sergiloides*)
- Alluvium

## Notes

Contour Interval is 10 meters

Scale 1" = 100'

File: Amity-7 3/15/94

# BIRCHAM

## Legend

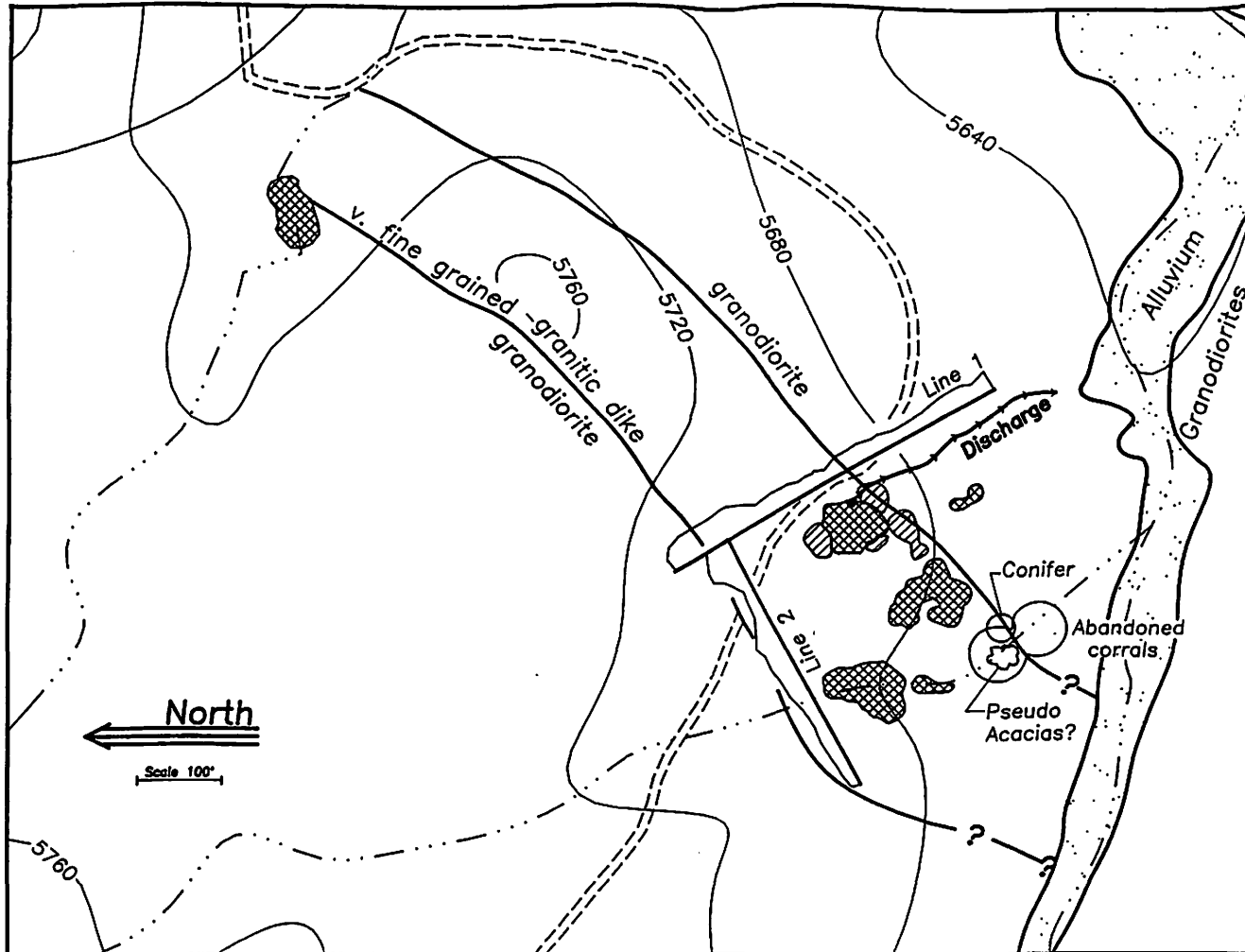
- 5640 — Ground contour
- == Dirt road
- Geologic contact
- Intermittent stream
- Fault plane, dipping toward symbol
- Flowing surface water or pipe
- Resistivity profile showing curve of resistivity
- Arroyo willow
- Mesquite
- Alluvium

## Notes

Contour Interval is 40 feet

Scale 1" = 150'

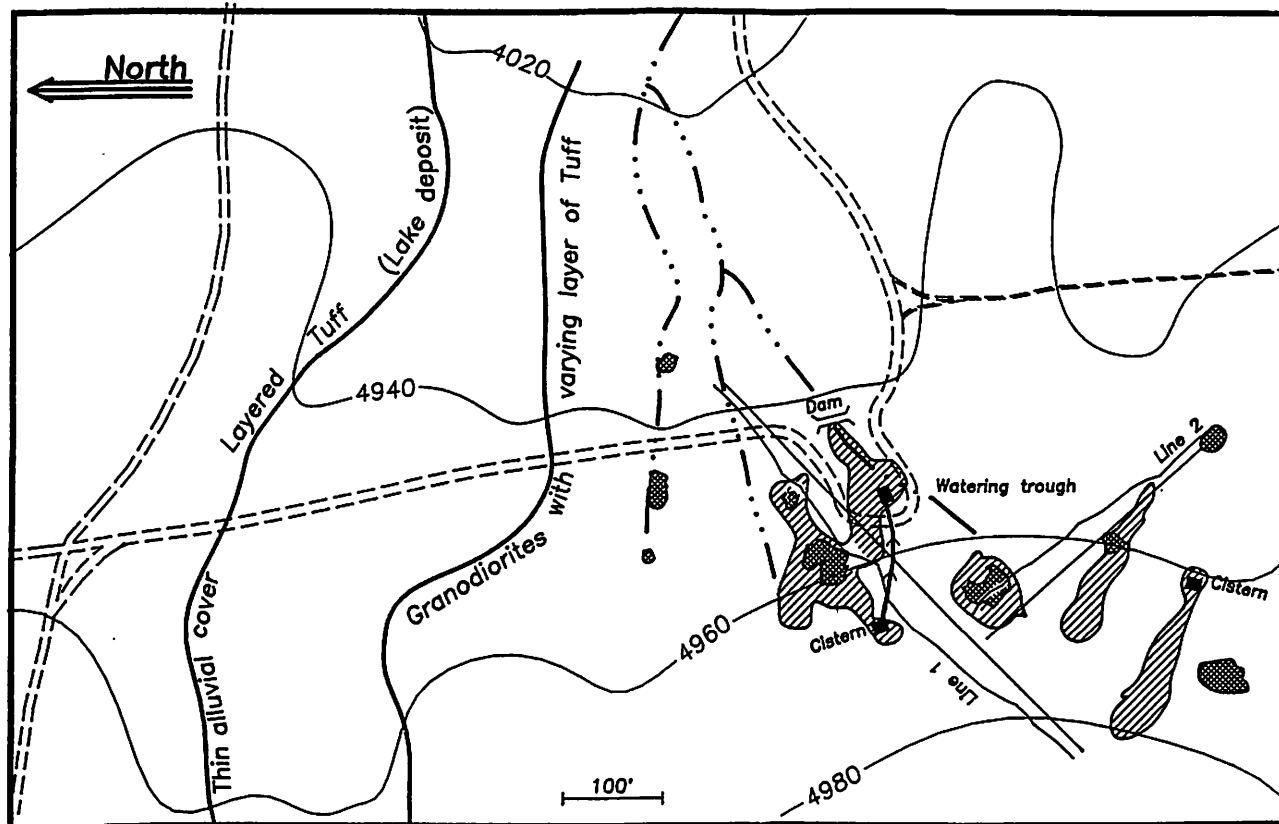
File: Birchum-7 3/15/94



T. W. Blithorn, Earth Sciences Consultants

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# China Gardens



## Legend

- 5640 — Ground contour
- - - - - Dirt road
- Geologic contact
- ... Intermittent stream
- Fault plane, dipping toward symbol
- Flowing surface water or pipe
- Resistivity profile showing curve of resistivity
- Arroyo willow
- Area of seepage from fractures

## Notes

Contour Interval is 20 feet

Scale 1" = 150'

File: China Gardens 6 3/15/94

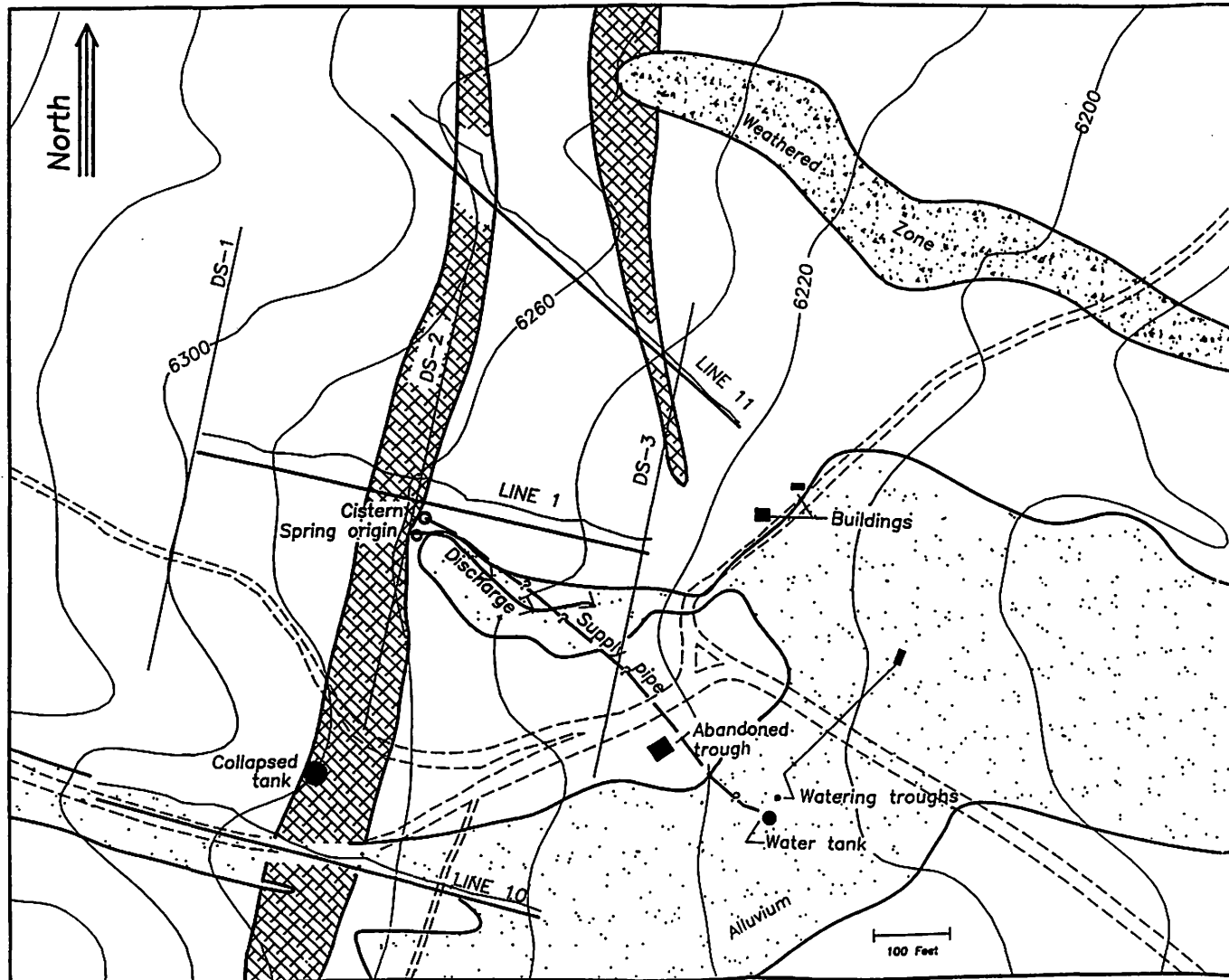
T. W. Bilhorn, Earth Sciences Consultants

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Cole

NAWS CL TP 005

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## Notes

No riparian vegetation at the site  
(See Text)

Contour Interval is 20 feet

Scale 1" = 150'

File: Cole-9 3/15/94

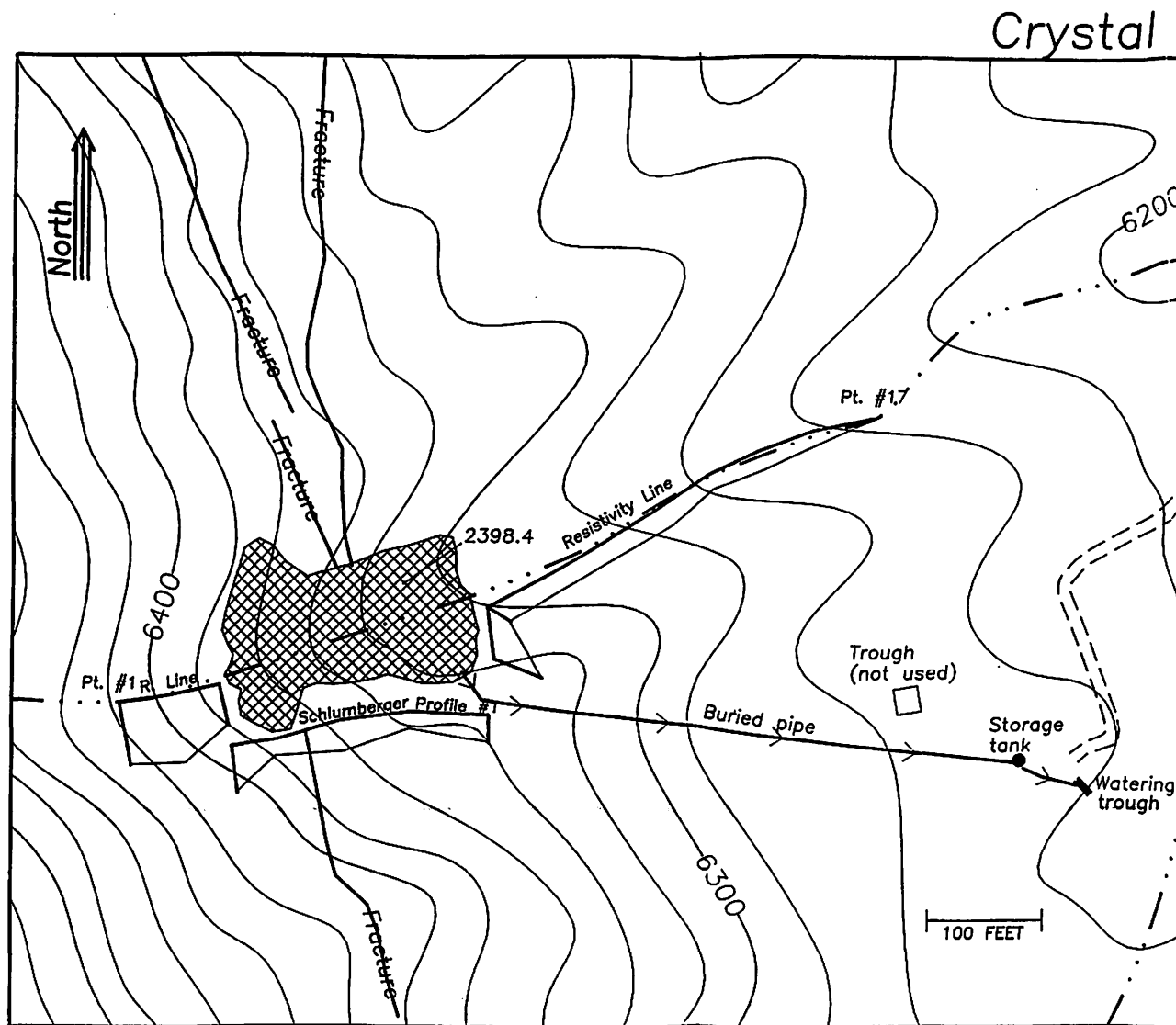
T. W. Bilhorn, Earth Sciences Consultants

## Legend

- 5640 — Ground contour
- - - - - Dirt Road
- granodiorite  
alluvium Geologic Contact
- · - · - Intermittent stream

- Fault plane dipping toward symbols
- Flowing surface water or pipe
- Resistivity profile showing curve of resistivity

- Alluvium
- Dike, conduit-fracture
- Intermixed weathered granitic rocks and tuffs



### Legend

- 5640 — Ground contour
- == == == Dirt Road
- granodiorite — Geologic Contact
- aluvium —
- - - - Intermittent stream
- - - - Fault plane dipping toward symbols
- - - - Flowing surface water or pipe
- - - - Resistivity profile showing curve of resistivity
- ⊗ Arroyo willow

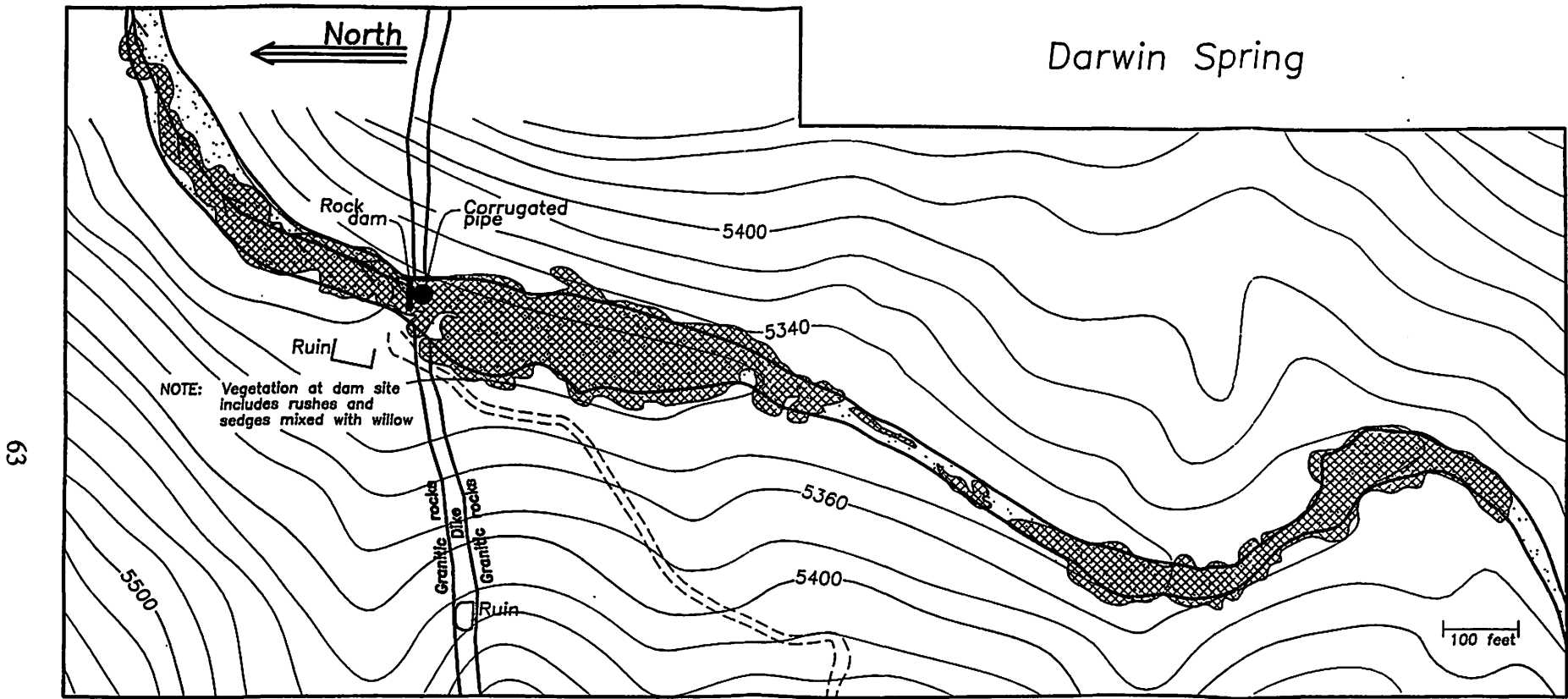
### Notes

- Contour Interval is 20 feet
- Scale 1" = 150'

File: Crystal-6 3/16/94

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## Legend

- 5640 — Ground contour
- ===== Dirt road
- granodiorite  
Alluvium Geologic contact

- → → Flowing surface water or pipe
- ▨ Arroyo willow
- ▤ Alluvium

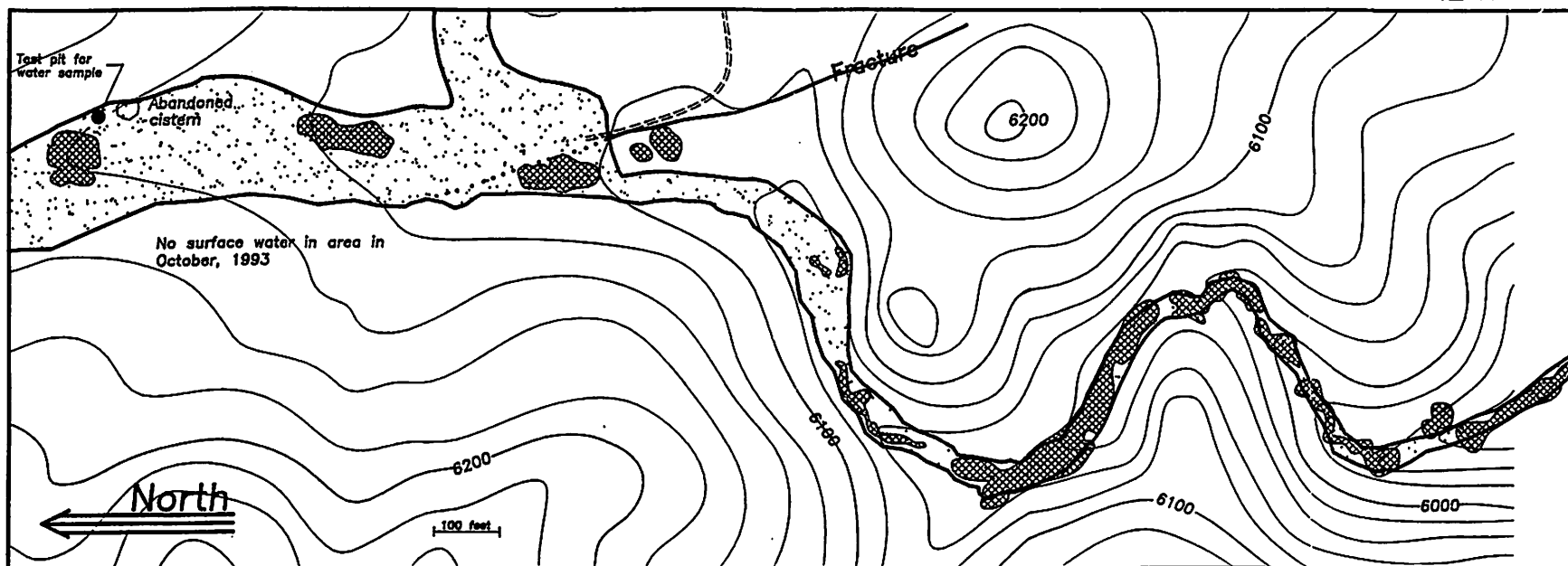
## Notes

Contour Interval is 20 feet  
Scale 1" = 150'

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File: Darwin-5 2/20/94

# DEAD END CABIN



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## Legend

- |                                 |                  |  |                               |
|---------------------------------|------------------|--|-------------------------------|
| — 5840 —                        | Ground contour   |  | Flowing surface water or pipe |
| - - - - -                       | Dirt road        |  | Arroyo willow                 |
| <u>granodiorite</u><br>Alluvium | Geologic contact |  | Alluvium                      |

## Notes

Contour Interval is 20 feet

Scale 1" = 200'

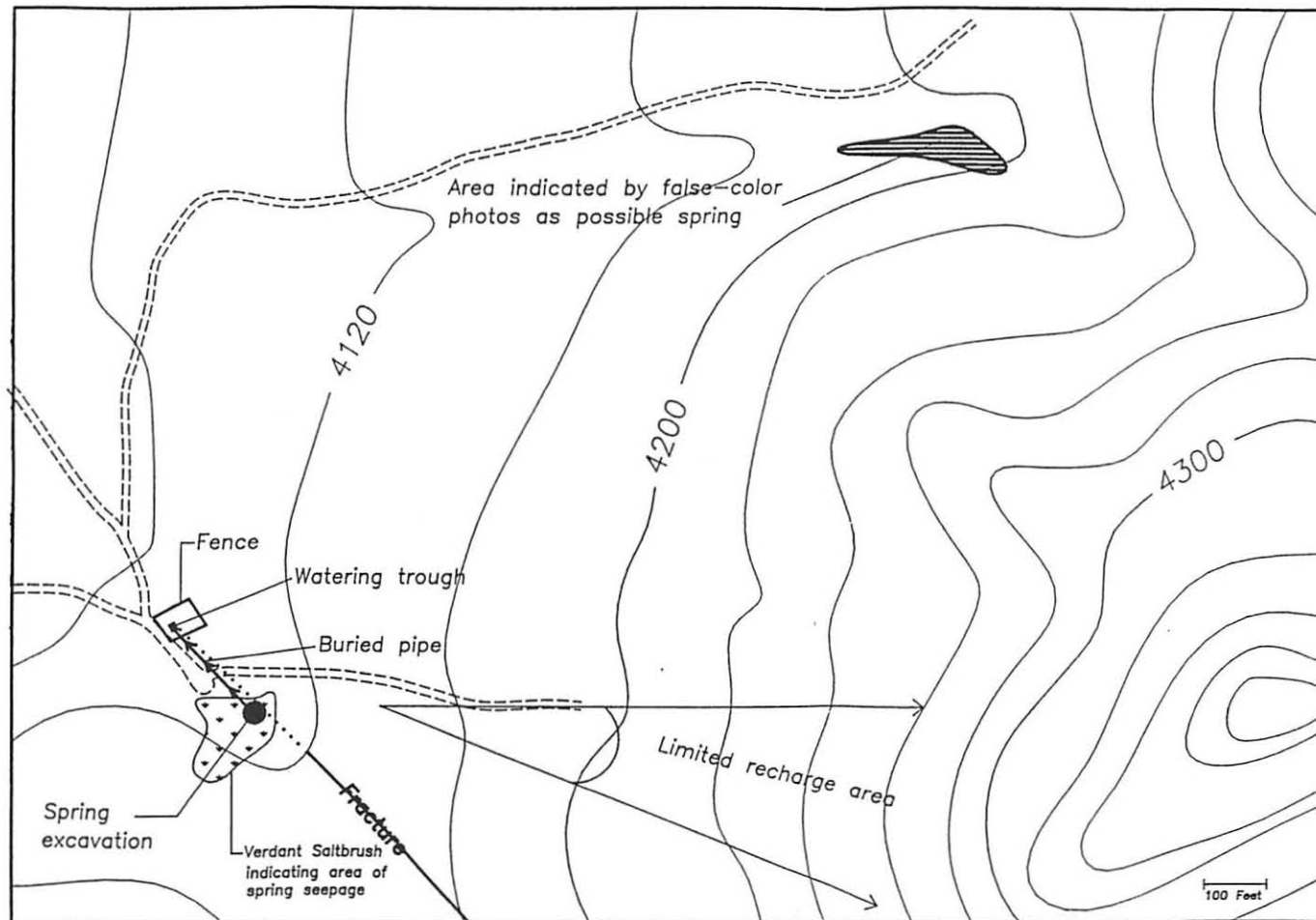
Vegetation identification tentative as full area not examined in field

Photo/topographic match in south half of area is poor.

T. W. Bilhorn, Earth Sciences Consultants

File: Deabn-B2 1/19/94

## Granite Wells



## Legend

- 5640 — Ground contour
- - - - - Dirt Road
- granodiorite —  
— alluvium — Geologic Contact
- . . . - Intermittent stream
- - - - - Fault plane dipping toward symbols
- → → → → Flowing surface water or pipe
- — — — — Resistivity profile showing curve of resistivity
- ○ ○ Saltbrush

## Notes

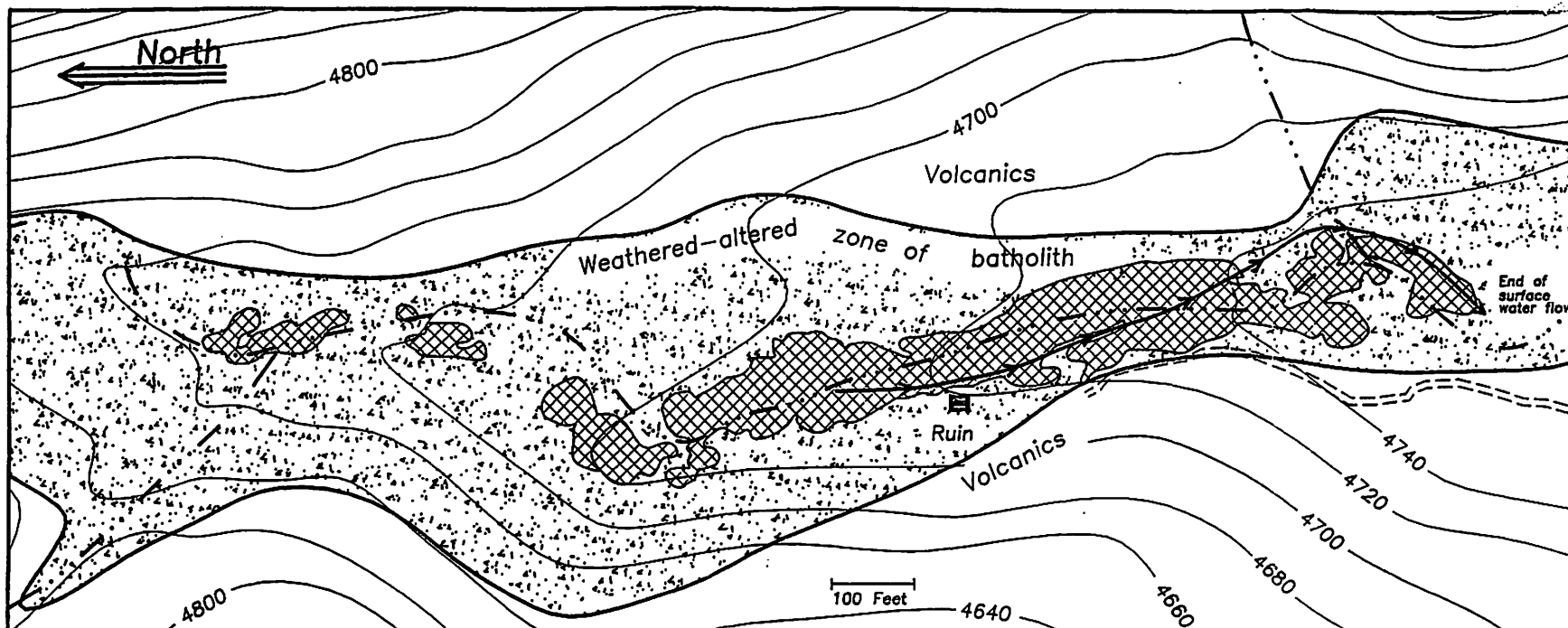
Contour Interval is 40 feet

Scale 1" = 200'

File: Granit-2 3/16/94

T. W. Bilhorn, Earth Sciences Consultants

# HAWIEE



## Legend

- 5640 — Ground contour
- Dirt road
- granodiorite  
Alluvium Geologic contact

- Flowing surface water or pipe
- Arroyo willow
- Weathered-altered zone

## Notes

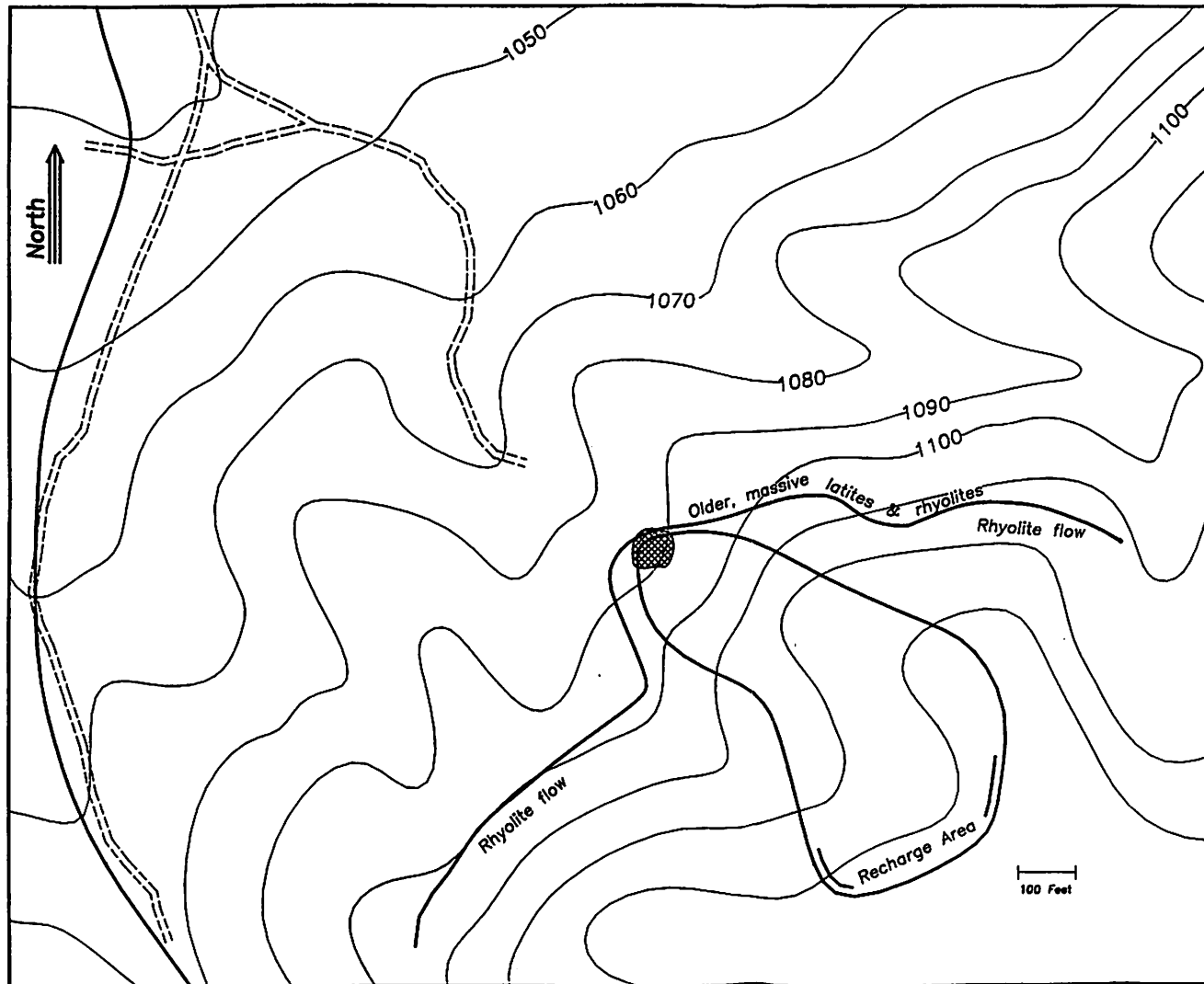
Contour Interval is 20 feet  
Scale 1" = 150'

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File: Hawiee-3 1/20/94

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Hidden



Legend

-  5640 Ground contour  
 Dirt road  
 Geologic contact  
 Intermittent stream  
 Fault plane, dipping toward symbol  
 Flowing surface water or pipe  
 Resistivity profile showing curve of resistivity  
 Arroyo willow

## Notes

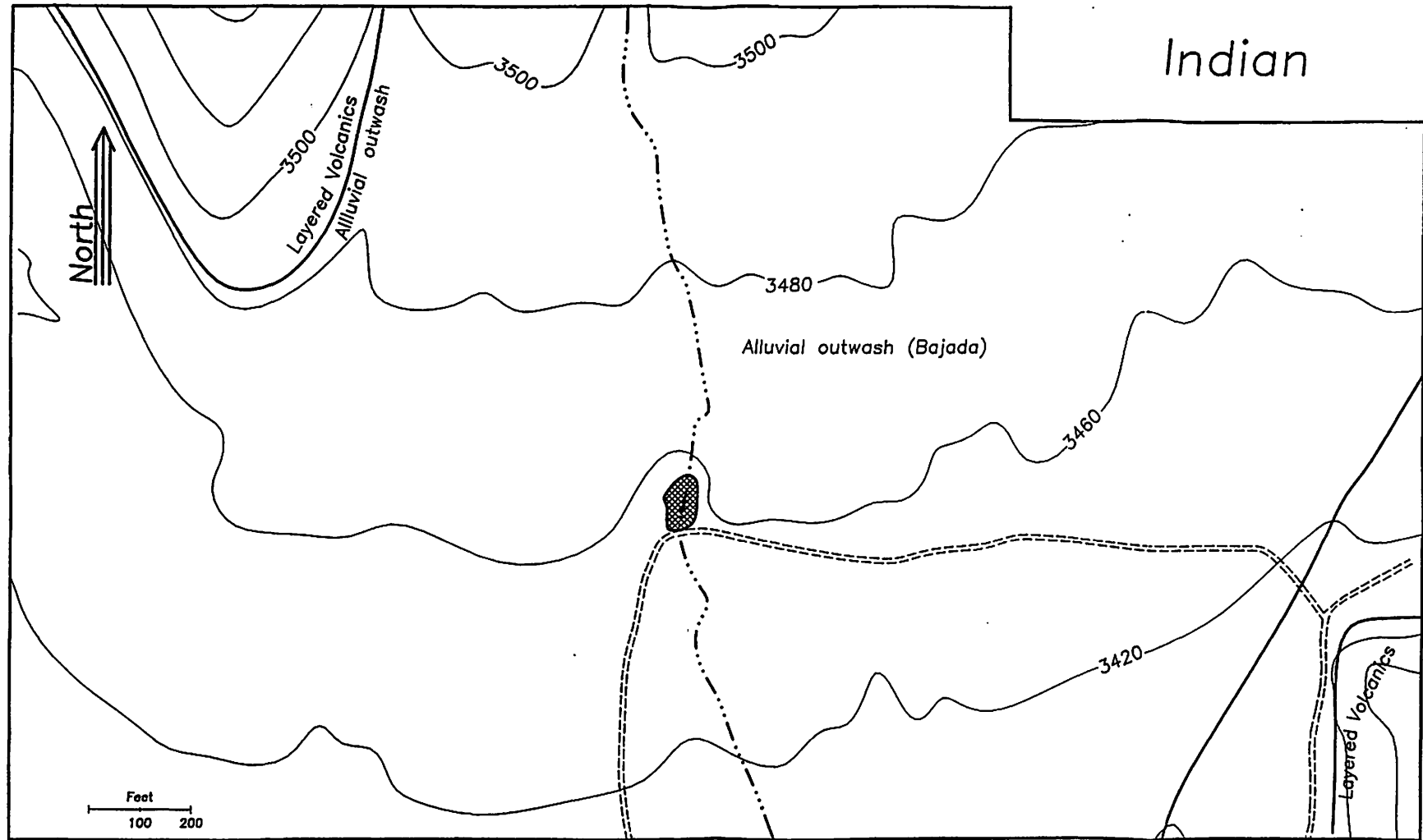
Contour Interval is 10 meters

Scale 1" = 200'

File: Hiddn-4 3/17/94

**T. W. Bilhorn, Earth Sciences Consultants**

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### Legend

- |               |                  |           |           |           |                     |                |
|---------------|------------------|-----------|-----------|-----------|---------------------|----------------|
| — 3540 —      | Ground contour   | — — — — — | Dirt road | — · — · — | Intermittent stream | Typha & Juncus |
| — Volcanics — | Geologic contact |           |           |           |                     |                |
| — Alluvium —  |                  |           |           |           |                     |                |

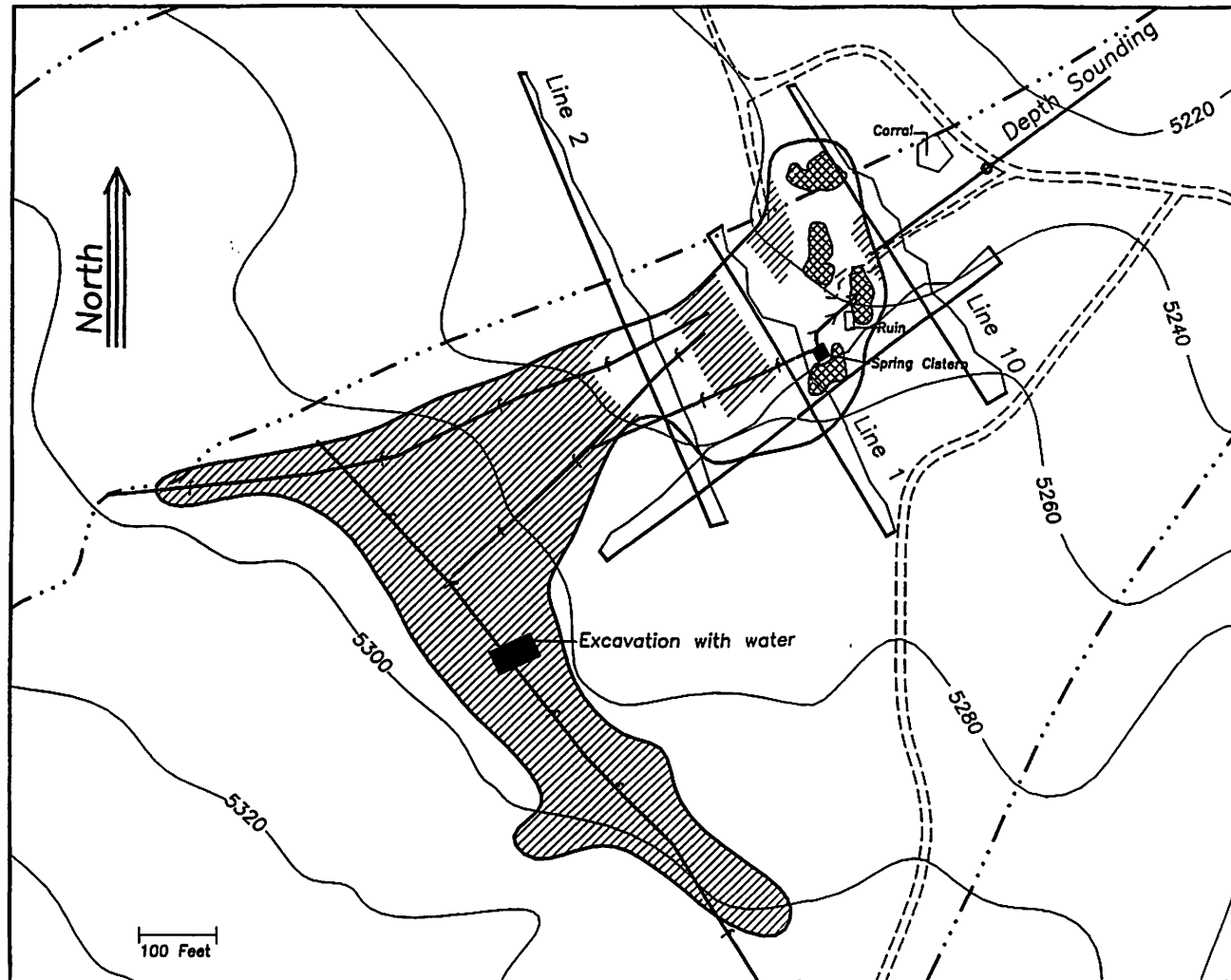
### Notes

Contour Interval is 20 feet  
Scale 1" = 200'

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File: Indian-5 3/17/84

## Indian Gardens



## Legend

- 5640 — Ground contour
- - - - - Dirt road
- granodiorite  
— Alluvium — Geologic contact
- . - . - Intermittent stream
- - - - - Fault plane, dipping  
toward symbol
- - - - - Flowing surface  
water or pipe
- - - - - Resistivity profile  
showing curve of  
resistivity
- ▨ Arroyo willow
- ▨ Area of seepage from fractures
- - - - - Fracture

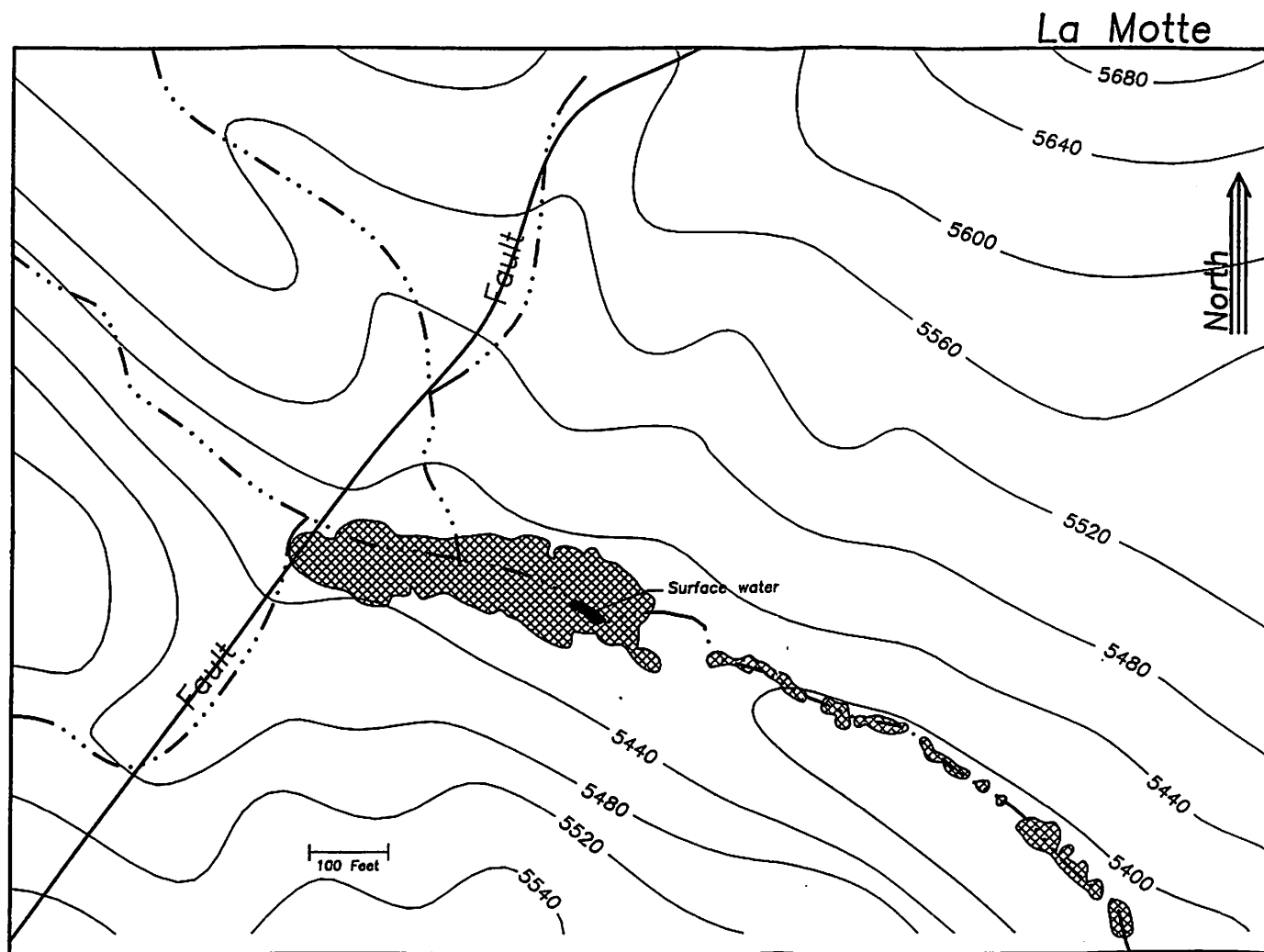
## Notes

Contour Interval is 20 feet

Scale 1" = 150'

File: INDGRD-5 3/17/94

T. W. Bilhorn, Earth Sciences Consultants



T. W. Bilhorn, Earth Sciences Consultants

### Legend

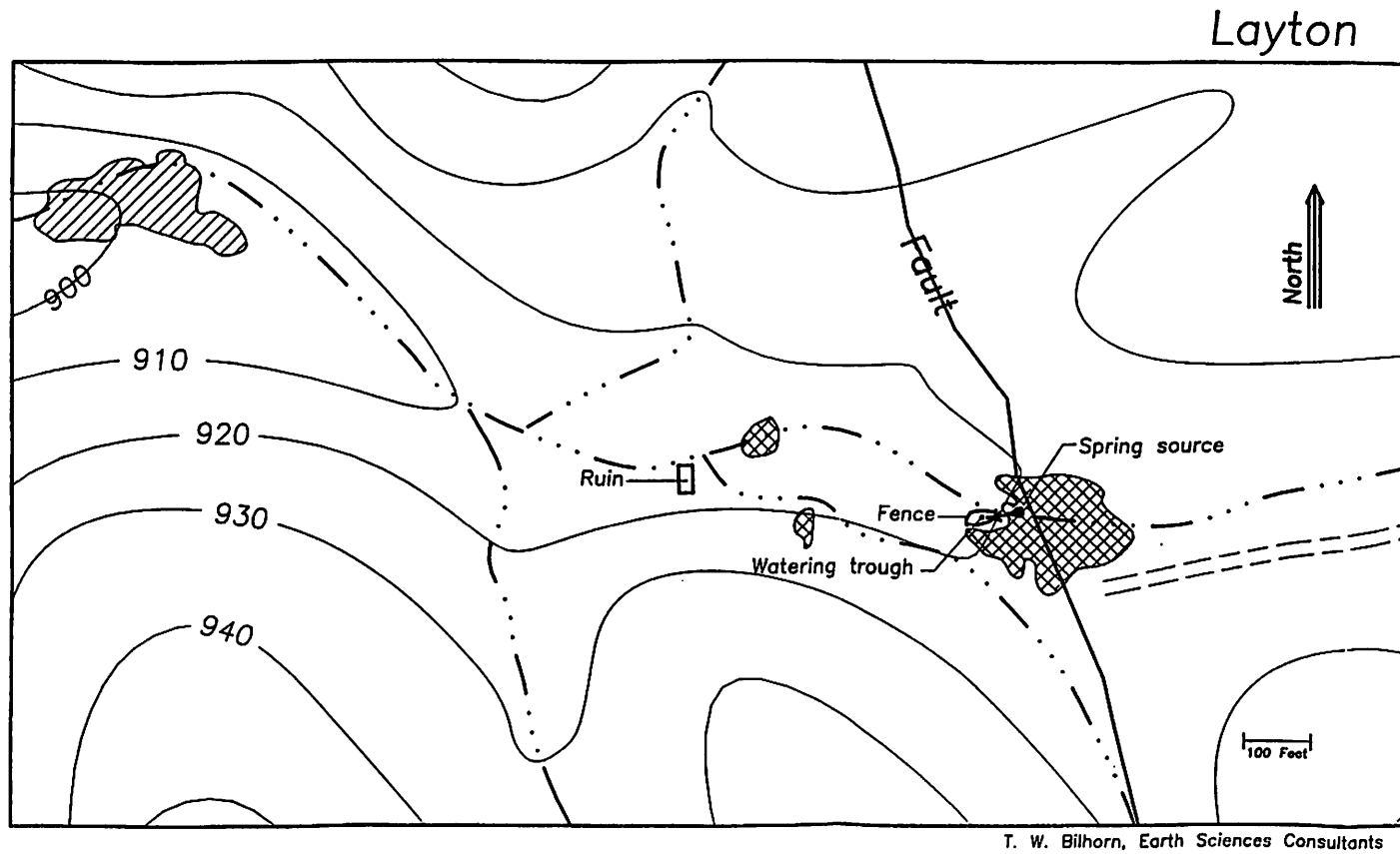
- 5640 — Ground contour
- - - - - Dirt Road
- granodiorite  
alluvium Geologic Contact
- . . . - Intermittent stream
- . . . - Fault plane dipping  
toward symbols
- ~ ~ ~ ~ ~ Flowing surface  
water or pipe
- Arroyo Willow

### Notes

Contour Interval is 40 feet

Scale 1" = 150'

File: LAMOT-3 3/17/94



### Legend

- 5640 — Ground contour
- == == == Dirt Road
- granodiorite  
alluvium Geologic Contact
- . . - Intermittent stream
- - - Fault plane dipping  
toward symbols

- Flowing surface  
water or pipe
- Squaw water weed
- Phreatophytes  
not ground verified

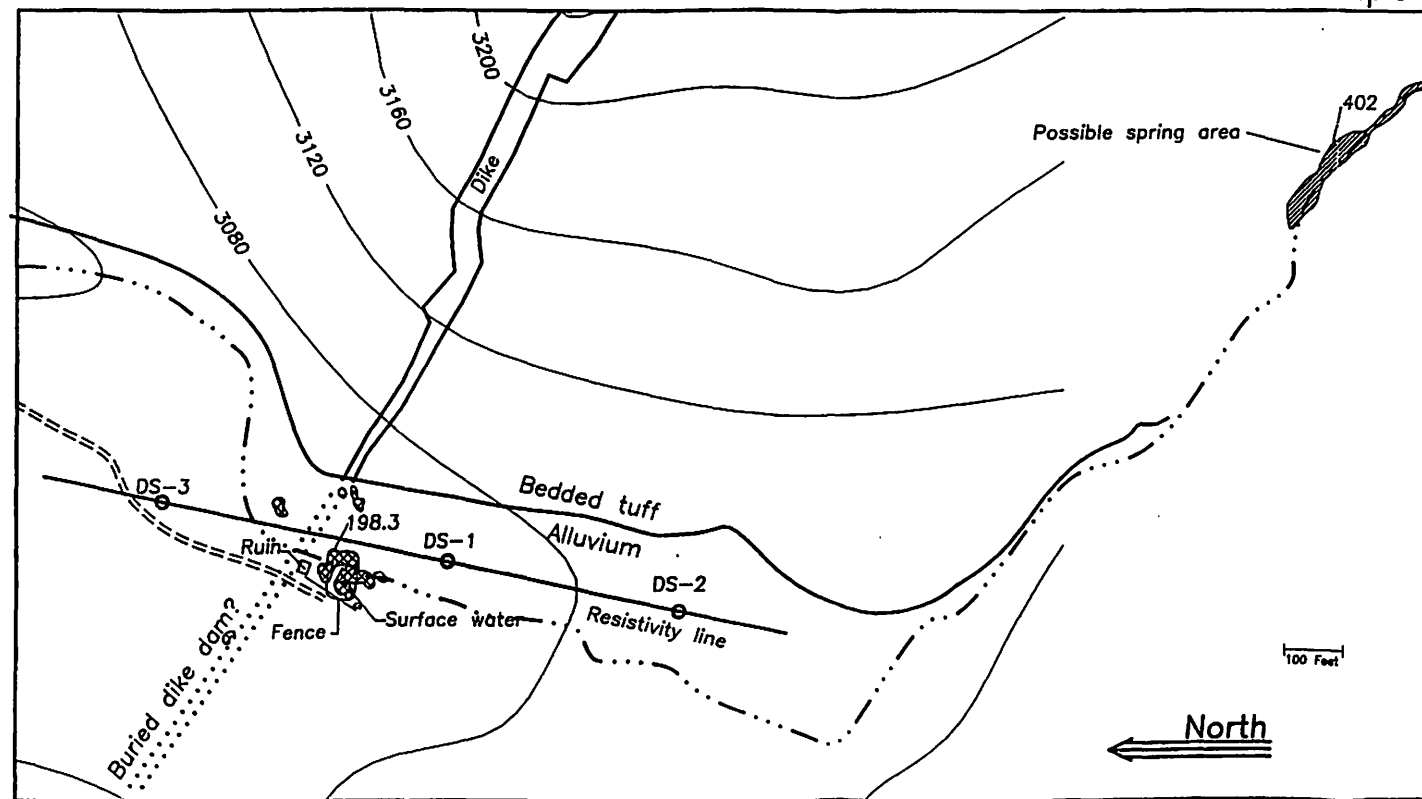
### Notes

Contour Interval is 10 meters

Scale 1" = 100'

File: Layton-3 3/17/94

## Lead Pipe



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## Legend

- 5640 — Ground contour
- Dirt road
- Tuff  
 Alluvium  
Geologic contact
- Intermittent stream
- Fault plane, dipping toward symbol
- Flowing surface water or pipe
- Resistivity line
- Squaw water weed
- Phreatophytes not ground verified

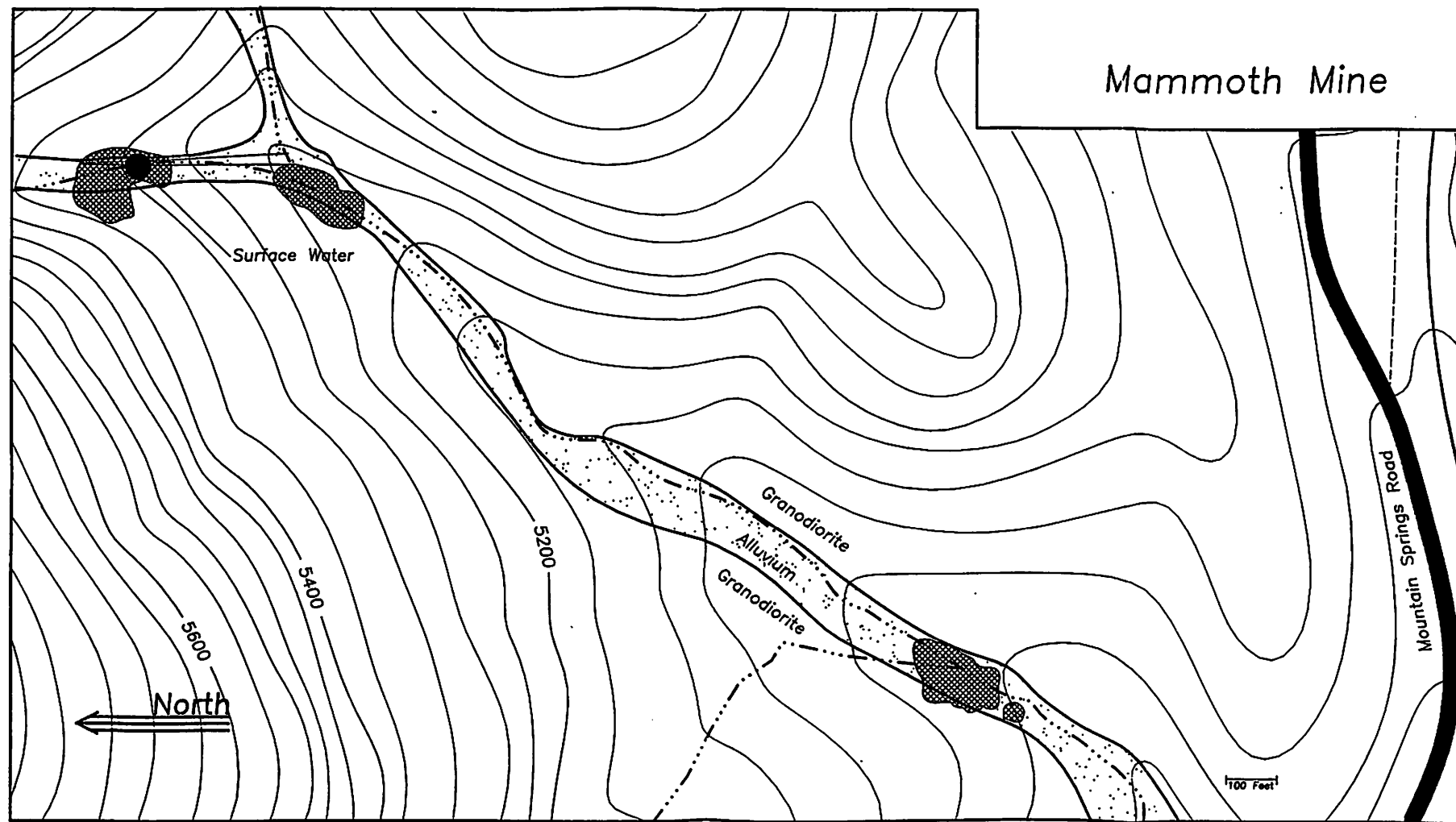
## Notes

Contour Interval is 40 feet

Scale 1" = 150'

File: LDIPE-5 3/17/94

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### Legend

- |                                  |                  |           |                               |   |          |
|----------------------------------|------------------|-----------|-------------------------------|---|----------|
| — 5600 —                         | Ground contour   | — — — — — | Intermittent stream           | ○ | Alluvium |
| - - - - -                        | Dirt road        | — — — — — | Flowing surface water or pipe |   |          |
| — granodiorite —<br>— Alluvium — | Geologic contact | ⊗         | Arroyo willow                 |   |          |

### Notes

Contour interval is 40 feet  
Scale 1" = 200'

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Mammoth Mine

Mountain Springs Road

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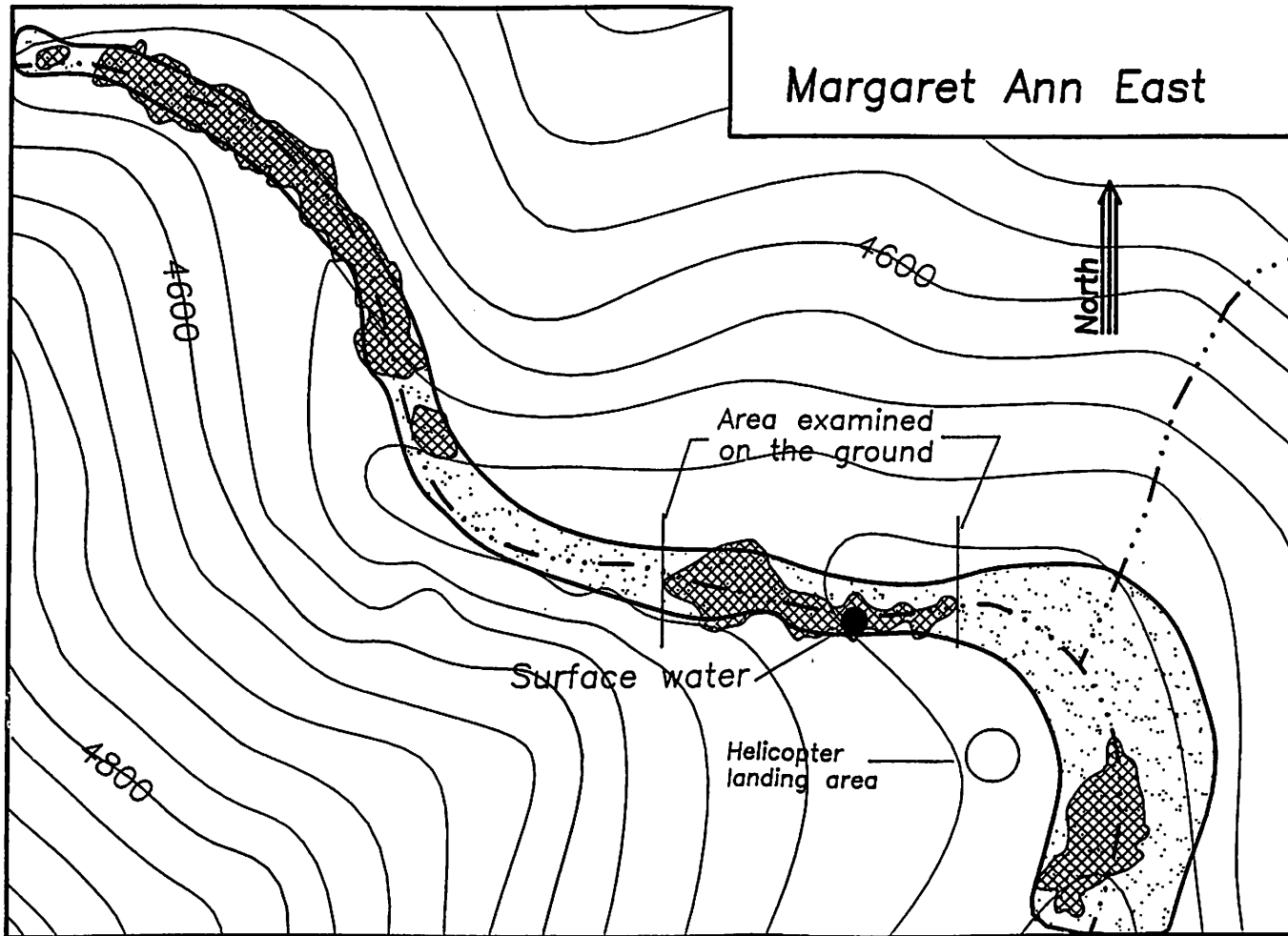
# Margaret Ann East

## Legend

- 5640 — Ground contour
- - - - - Dirt road
-  <sup>granodiorite</sup>  
Alluvium Geologic contact
- · - · - Intermittent stream
- · - · - Fault plane, dipping toward symbol
- - - - - Flowing surface water or pipe
-  Arroyo willow
-  Alluvium

## Notes

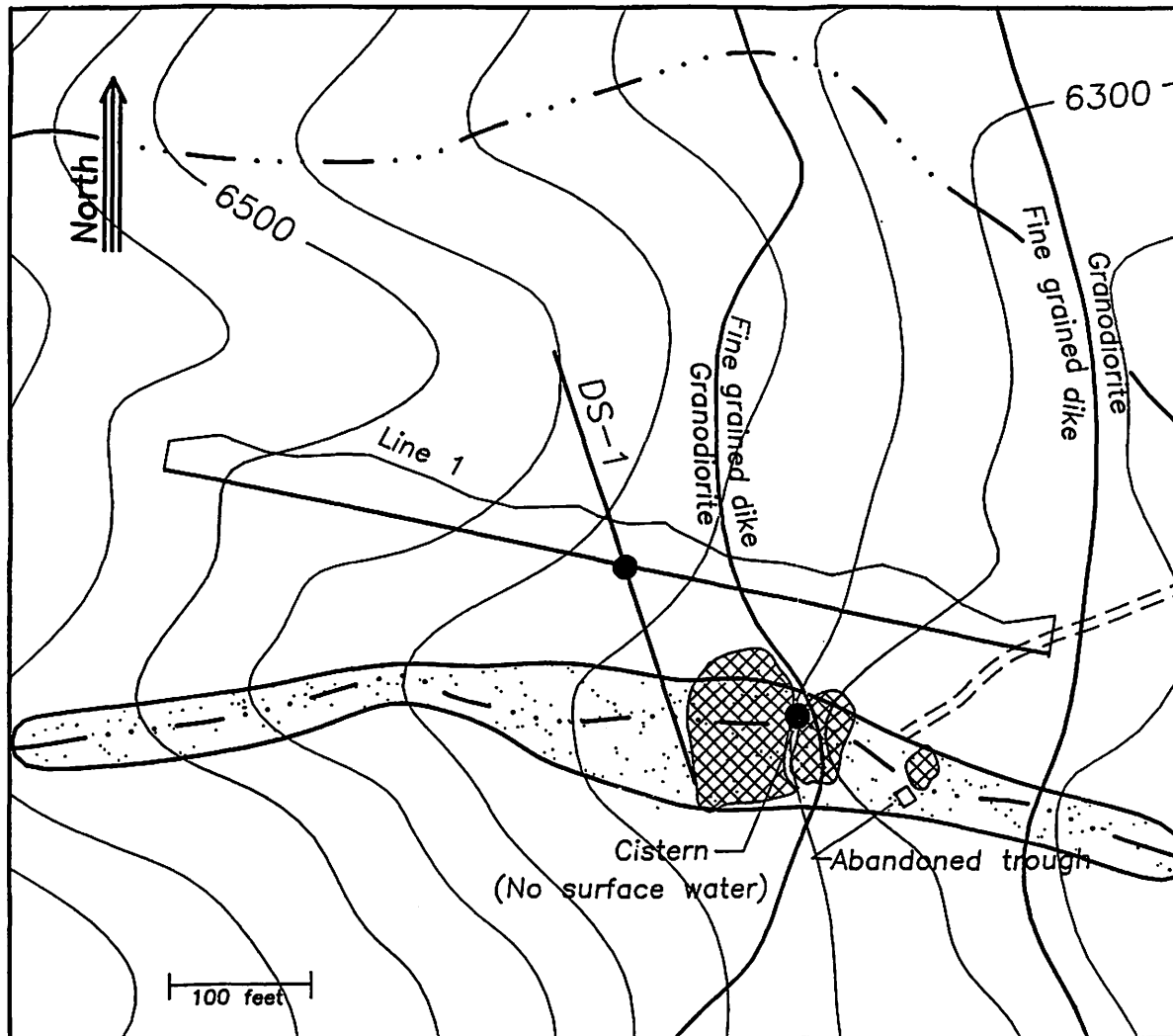
Contour Interval is 40 feet  
 Scale 1" = 150'  
 File: M-Ann-3 3/17/94



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# Mariposa



## Legend

- 5640 — Ground contour
- == == == Dirt road
- Geologic contact
- . - . - . Intermittent stream
- . . . . Fault plane, dipping toward symbol
- . . . . Flowing surface water or pipe
- . . . . Resistivity profile showing curve of resistivity
- Arroyo willow
- Alluvium

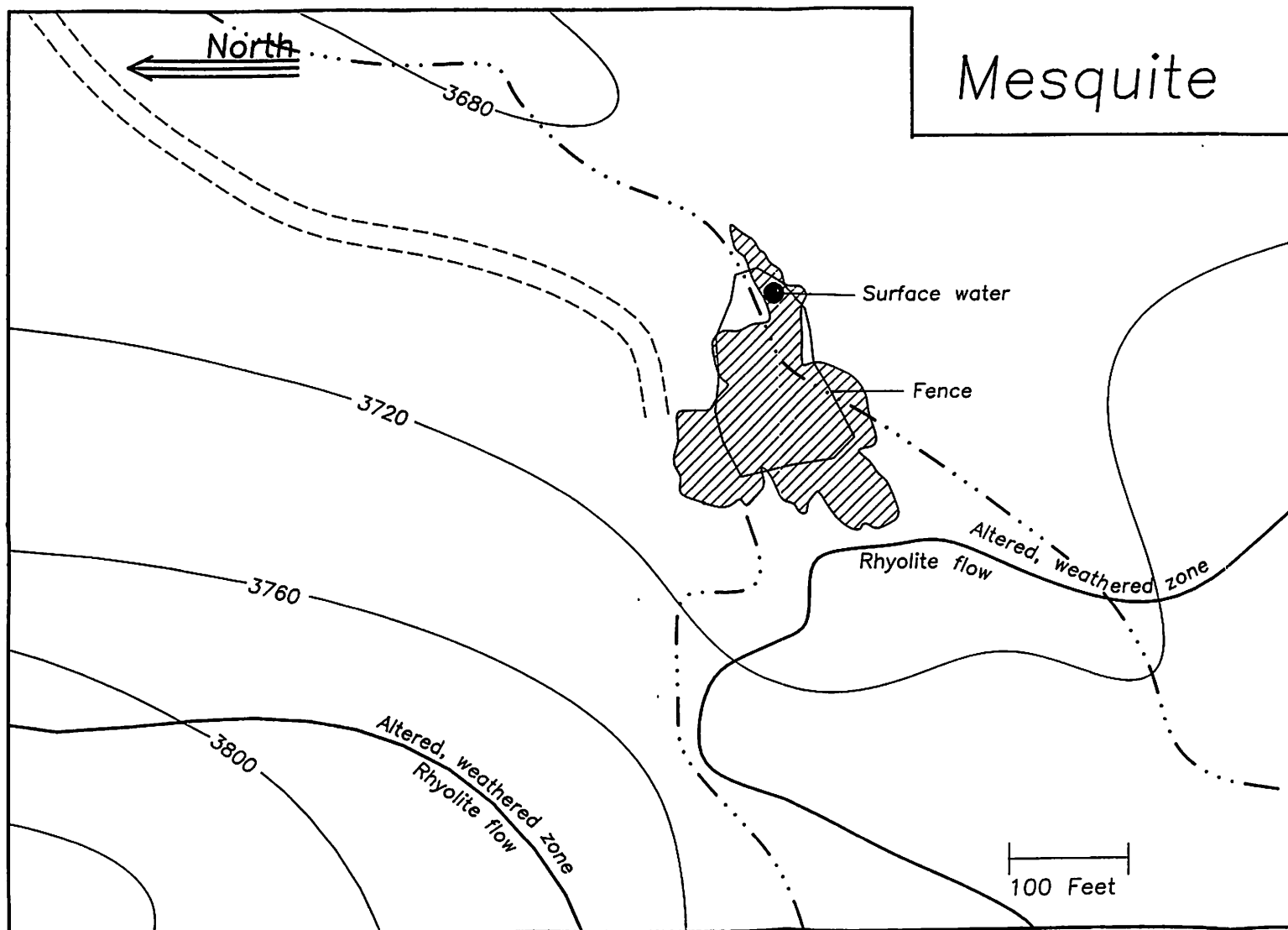
## Notes

Contour Interval is 40 feet  
Scale 1" = 100'

File: Marpos-5 3/17/94

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### Legend

- 5840 — Ground contour
- Dirt road
- granodiorite  
Alluvium Geologic contact
- ... Intermittent stream
- - - Fault plane, dipping toward symbol

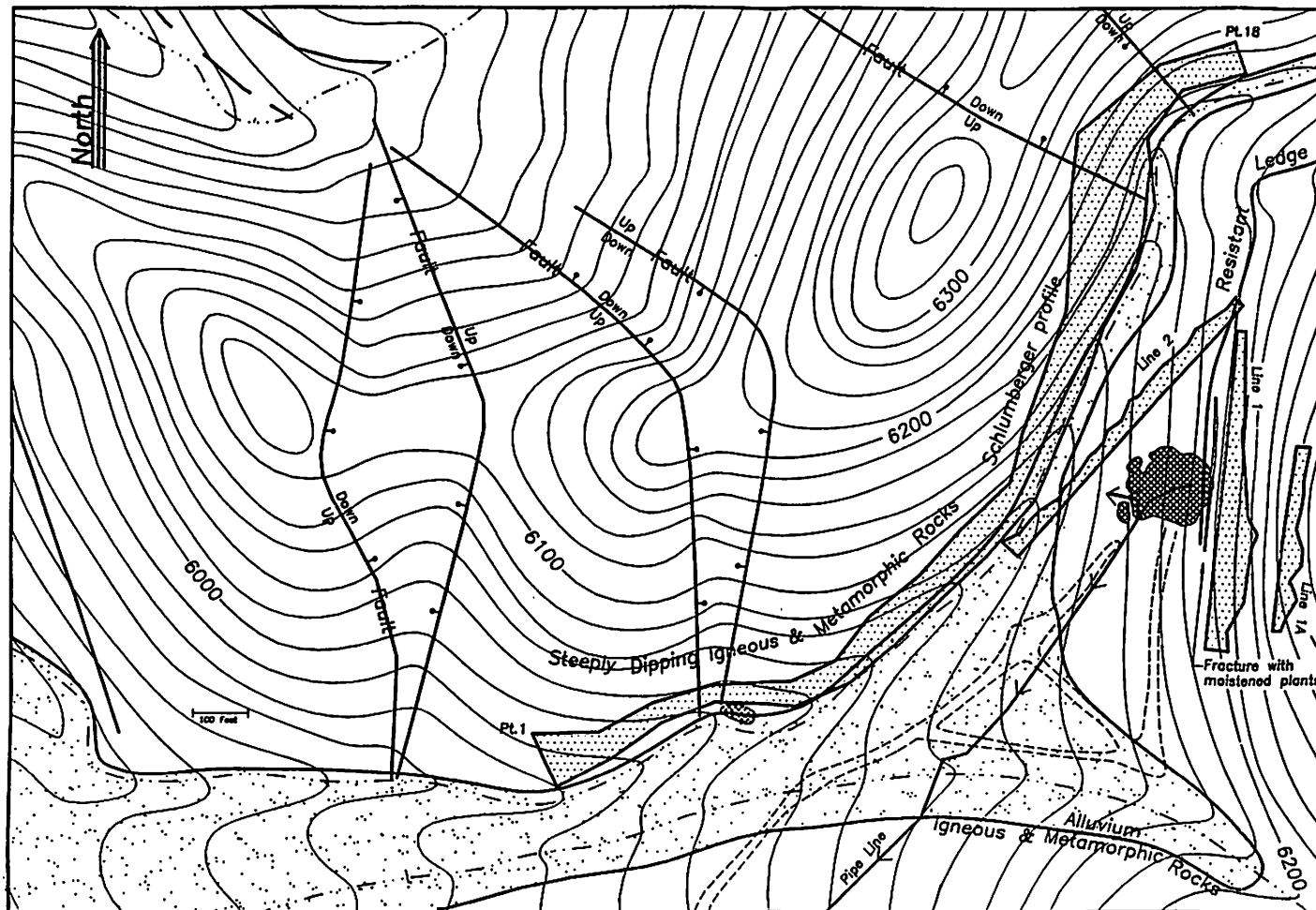
- ~~~~~ Flowing surface water or pipe
- ~~~~~ Resistivity profile showing curve of resistivity
- ◻ Mesquite (*Prosopis glandulosa*)

### Notes

- Contour Interval is 40 feet
- Scale 1" = 50'

T. W. Bilhorn, Earth Sciences Consultants

## Newhouse



**T. W. Bilhorn, Earth Sciences Consultants**

### Legend

-  Ground contour  
 Dirt road  
 Geologic contact  
 Intermittent stream  
 Fault plane, dipping toward symbol  
 Flowing surface water or pipe  
 Resistivity profile showing curve of resistivity  
 Arroyo willow and Common Reed  
 Alluvium

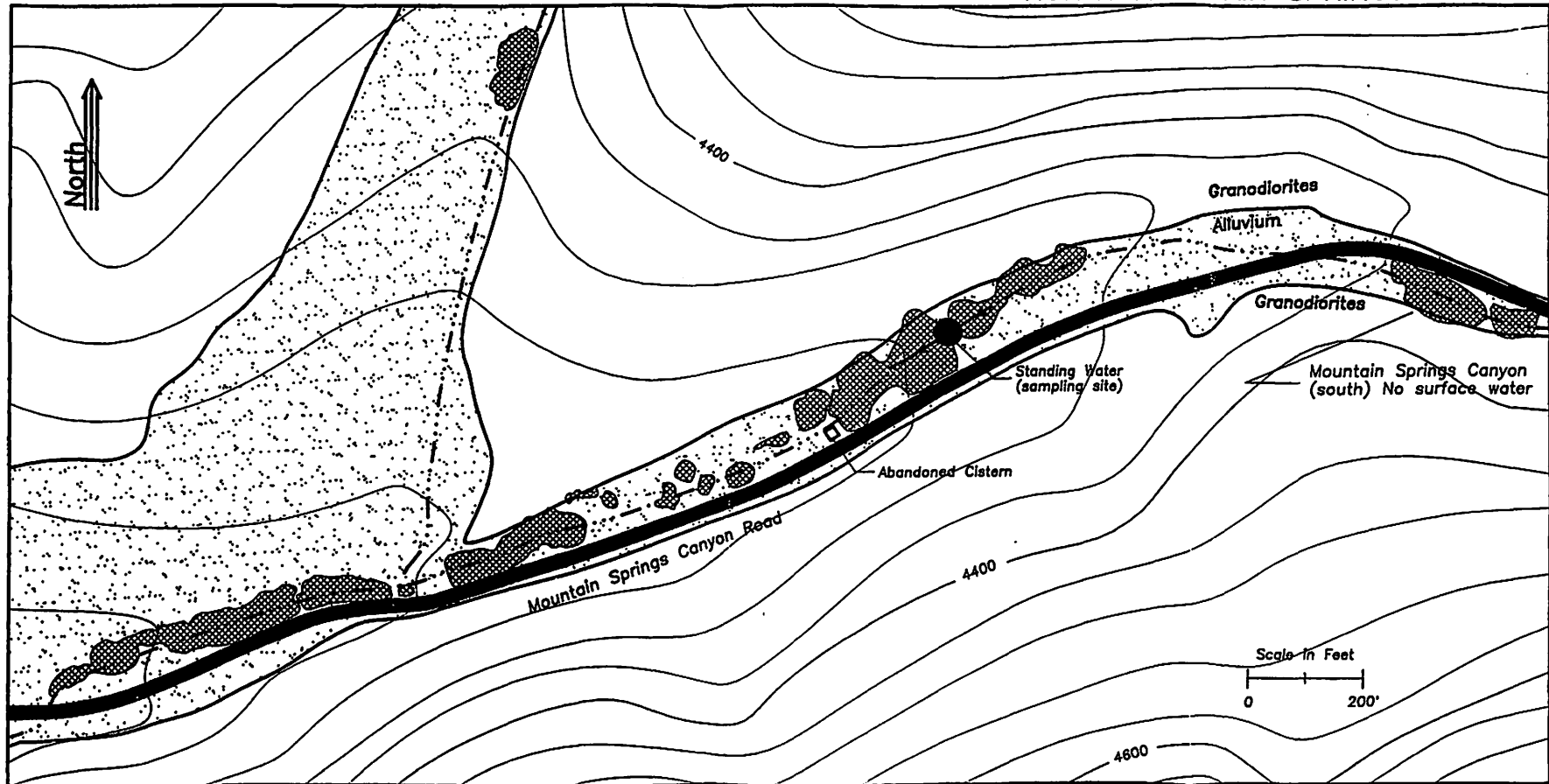
## Notes

Contour Interval is 20 feet

Scale 1" = 200'

File: new-4 3/17/94

# NORTH MOUNTAIN SPRINGS CANYON



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## Legend

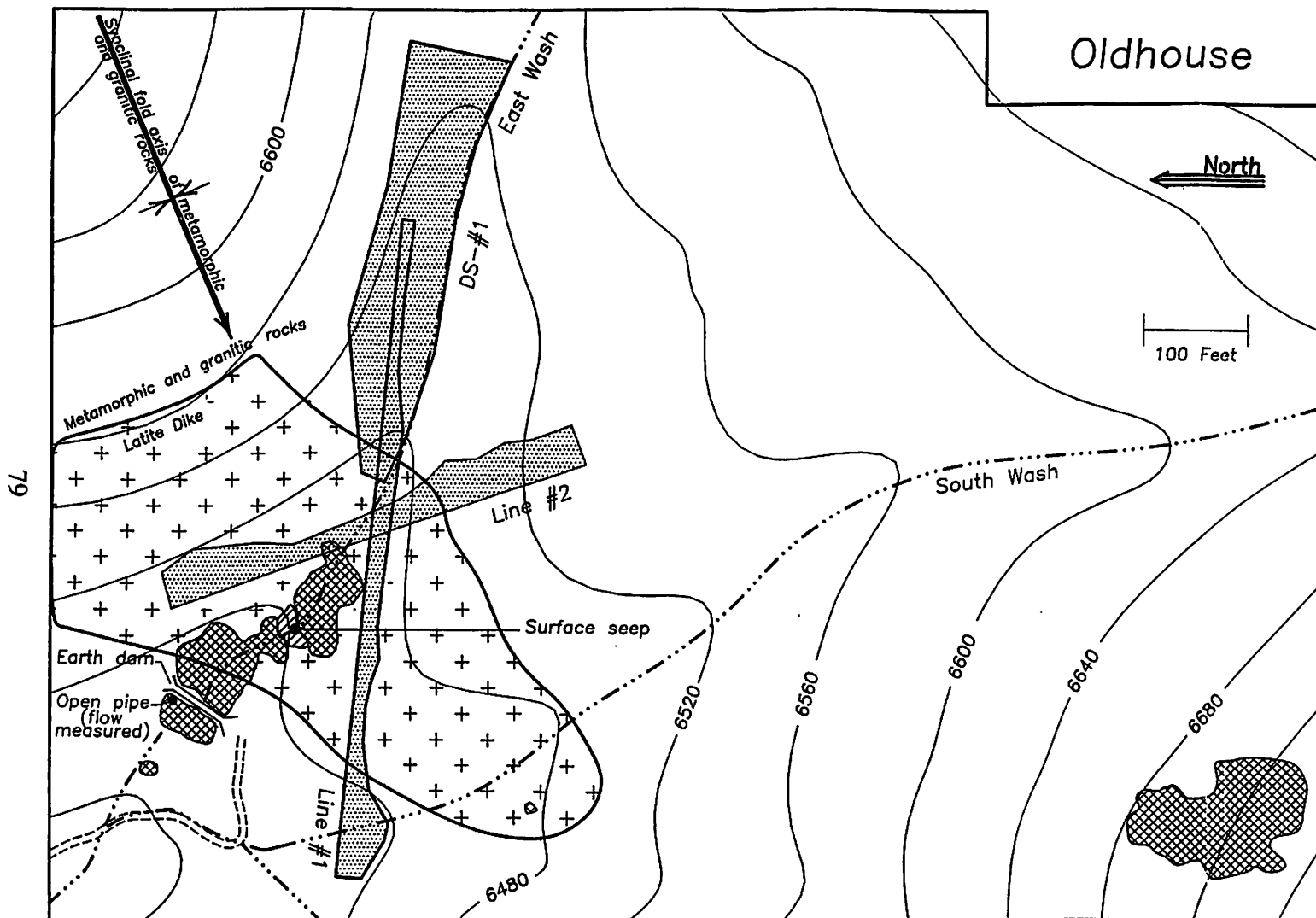
|              |                  |  |                                    |  |               |
|--------------|------------------|--|------------------------------------|--|---------------|
| 5640         | Ground contour   |  | Fault plane, dipping toward symbol |  | Arroyo willow |
|              | Dirt road        |  | Flowing surface water or pipe      |  | Alluvium      |
|              | Geologic contact |  |                                    |  |               |
| granodiorite |                  |  |                                    |  |               |
| Alluvium     |                  |  |                                    |  |               |

## Notes

Contour Interval is 40 feet  
Scale 1" = 200'

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File: nmtm-5 2/10/94



## Legend

- 5640 — Ground contour
- - - - - Dirt road
- granodiorite  
Alluvium Geologic contact
- - - - - Intermittent stream
- - - - - Fault plane, dipping toward symbol
- - - - - Flowing surface water or pipe
- Resistivity profile showing curve of resistivity
- Arroyo willow
- Saltgrass (*distichlis spicata*)

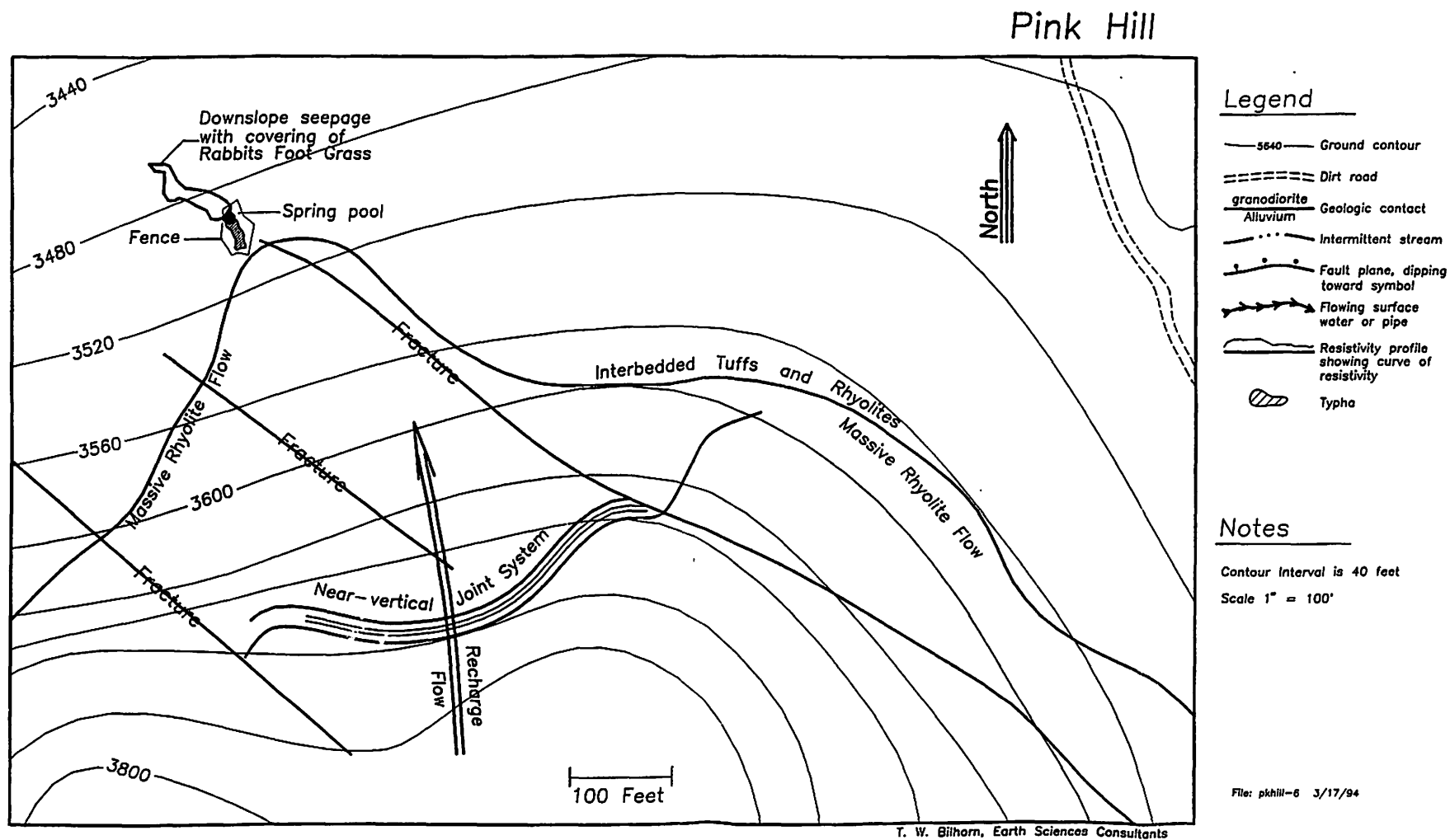
## Notes

Contour Interval is 40 feet  
Scale 1" = 100'

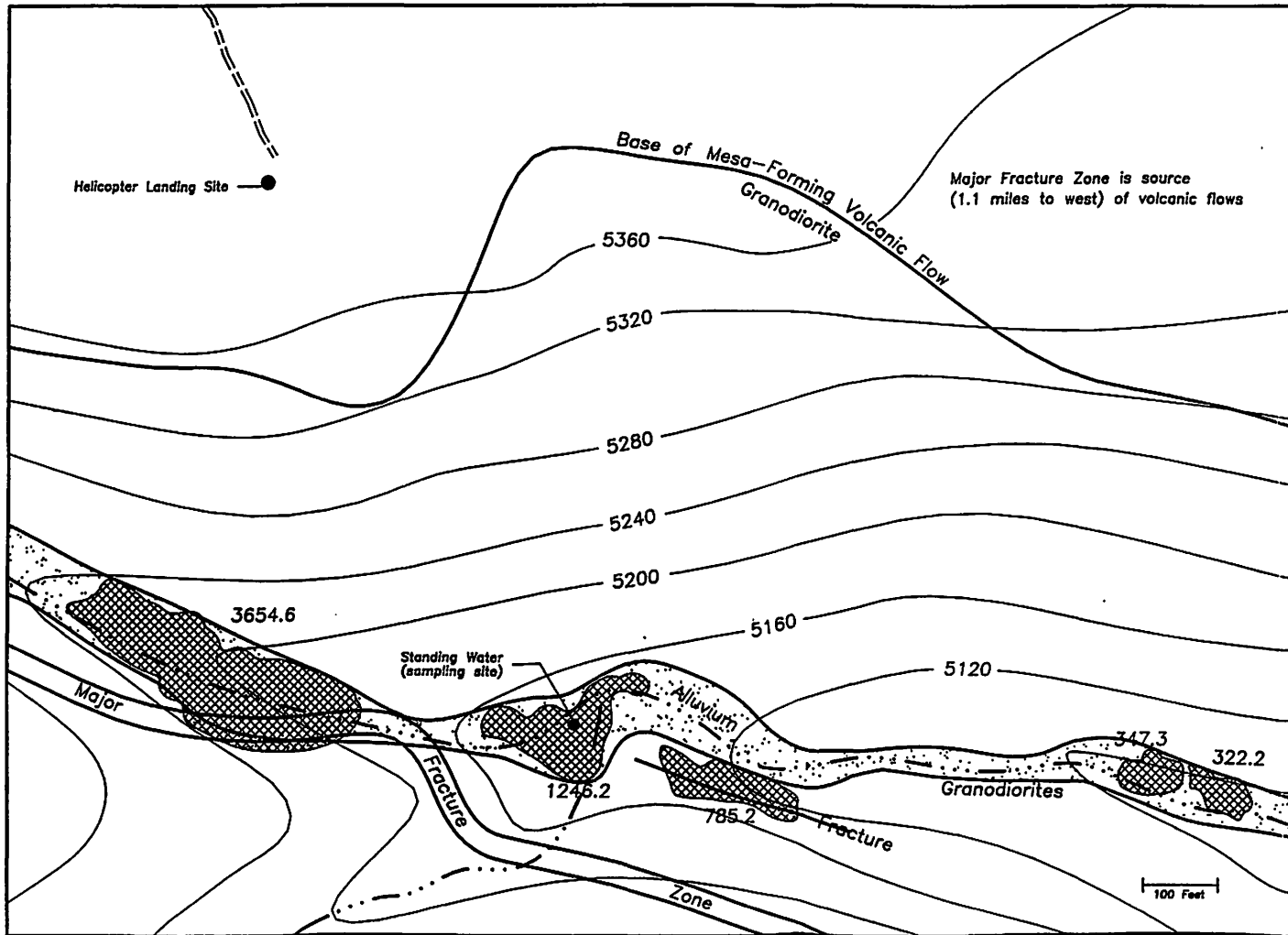
File: oldhs-4 3/17/94

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# Ruby West



## Legend

- 5640 — Ground contour
- - - - - Dirt road
- granodiorite  
Alluvium Geologic contact
- . . - - Intermittent stream
- - - - - Fault plane, dipping toward symbol
- - - - - Flowing surface water or pipe
- - - - - Resistivity profile showing curve of resistivity
- 6,355.5
- Arroyo willow
- Alluvium

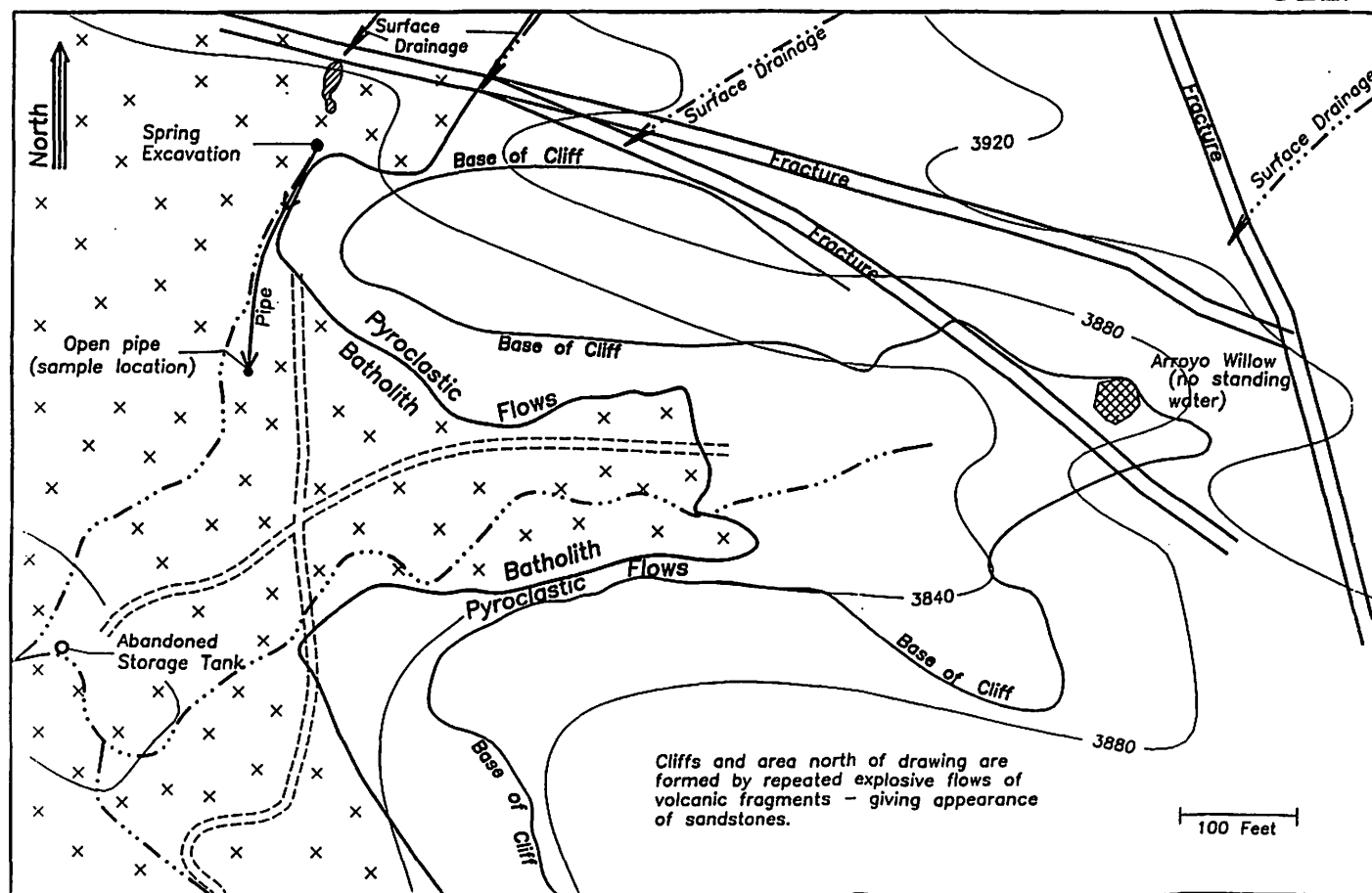
## Notes

Contour Interval is 40 feet  
Scale 1" = 150'

File: Ruby 5 3/17/94

T. W. Bilhorn, Earth Sciences Consultants

SEEP



## Legend

- 3840 — Ground contour
- - - - - Dirt road
- granodiorite / Alluvium Geologic contact
- . - . - Intermittent stream
- - - - - Fault plane, dipping toward symbol
- - - - - Flowing surface water or pipe
- Arroyo Willow
- Squaw Water Weed
- Granitic Rocks (highly chemically altered)

## Notes

Contour Interval is 40 feet

Scale 1" = 100'

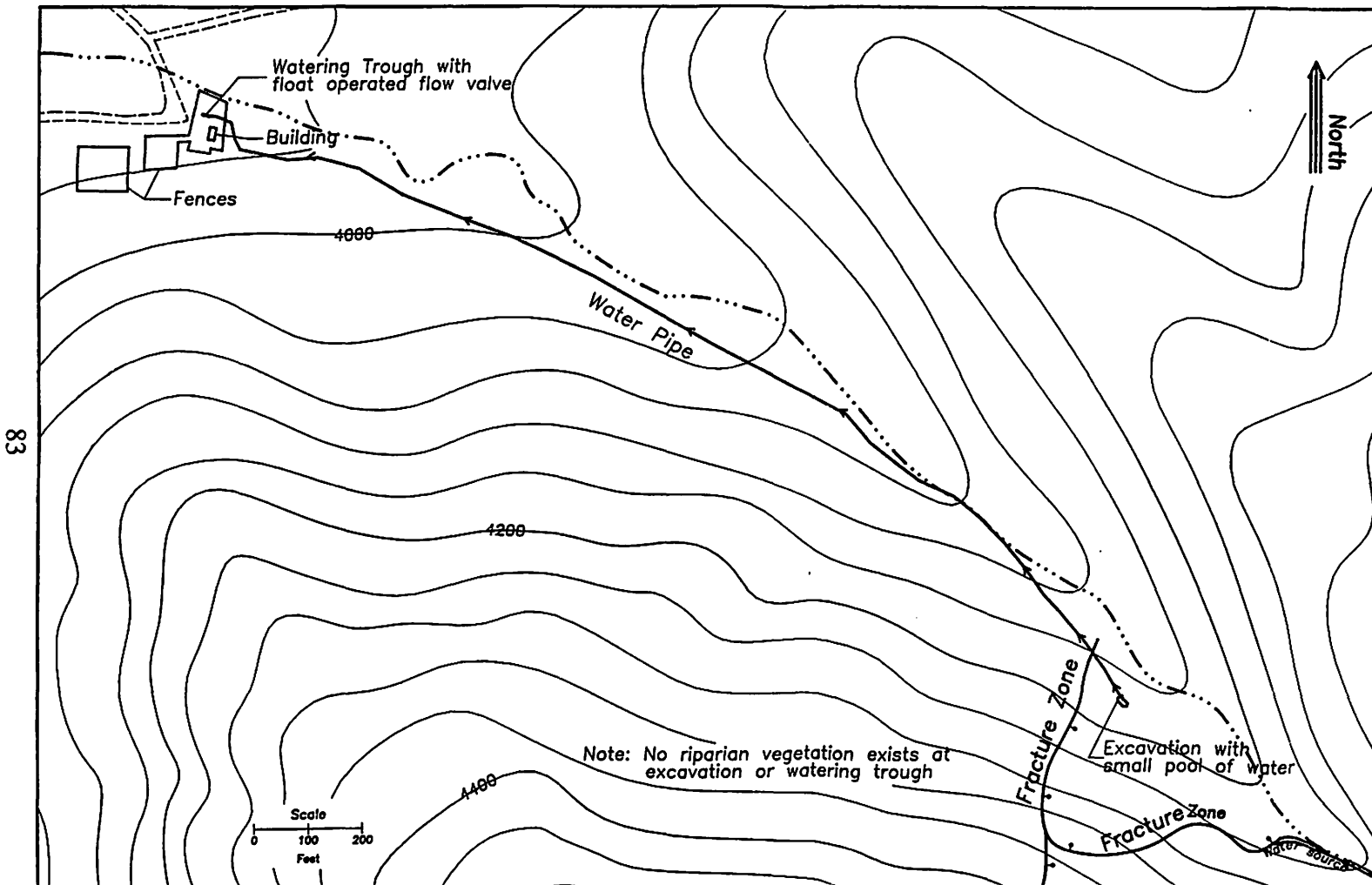
File: Seep-6 3/17/94

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## Stone Corral



### Legend

- 5640 — Ground contour
- - - - - Dirt road
- granodiorite  
Alluvium Geologic contact
- · - · - Intermittent stream
- · - · - Fault plane, dipping toward symbol
- - - - - Flowing surface water or pipe
- - - - - Resistivity profile showing curve of resistivity

### Notes

Contour Interval is 40 feet  
Scale 1" = 200'

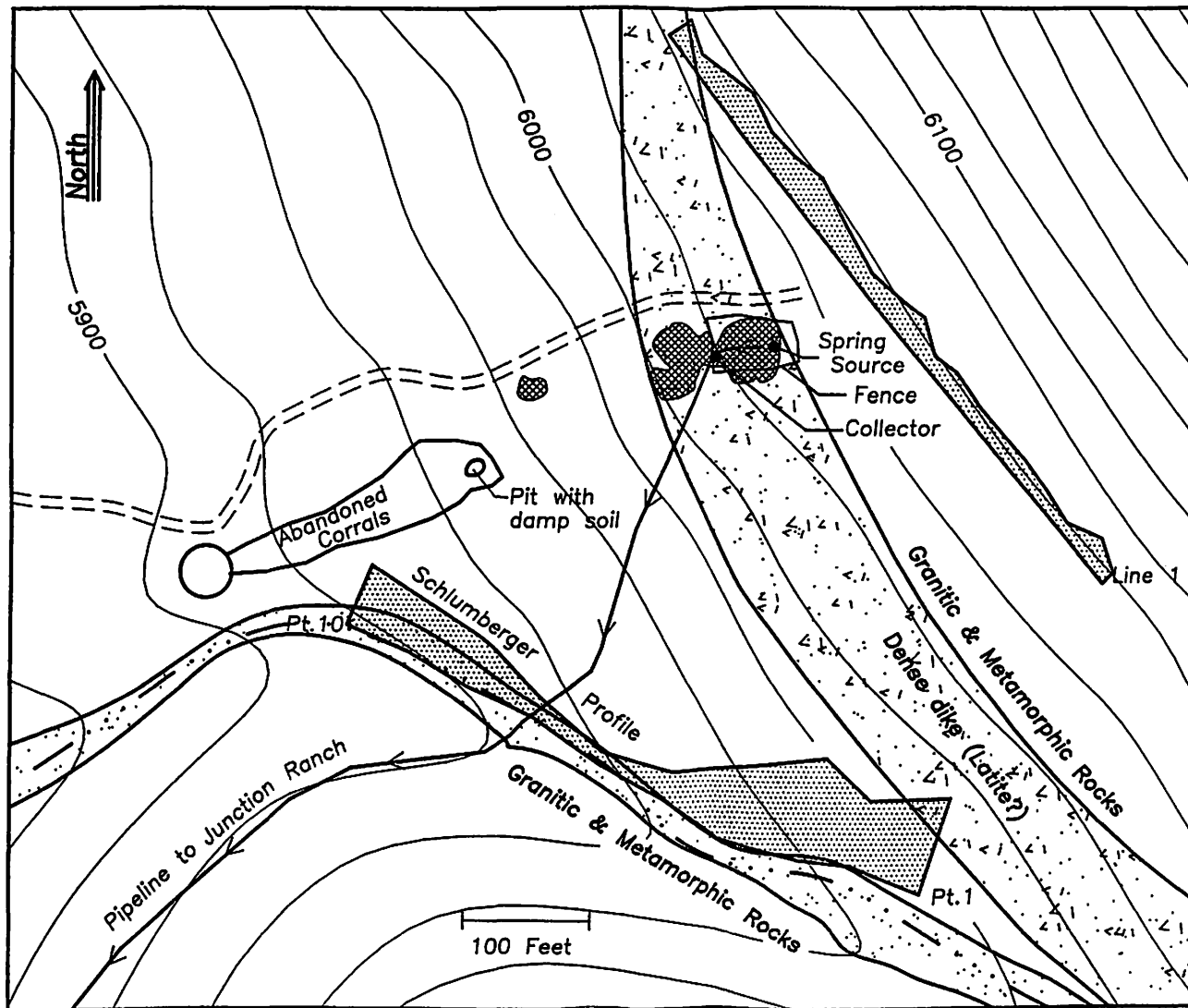
File: stncr1-5 3/17/94

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# Tennessee

NAWS CL TP 005



## Legend

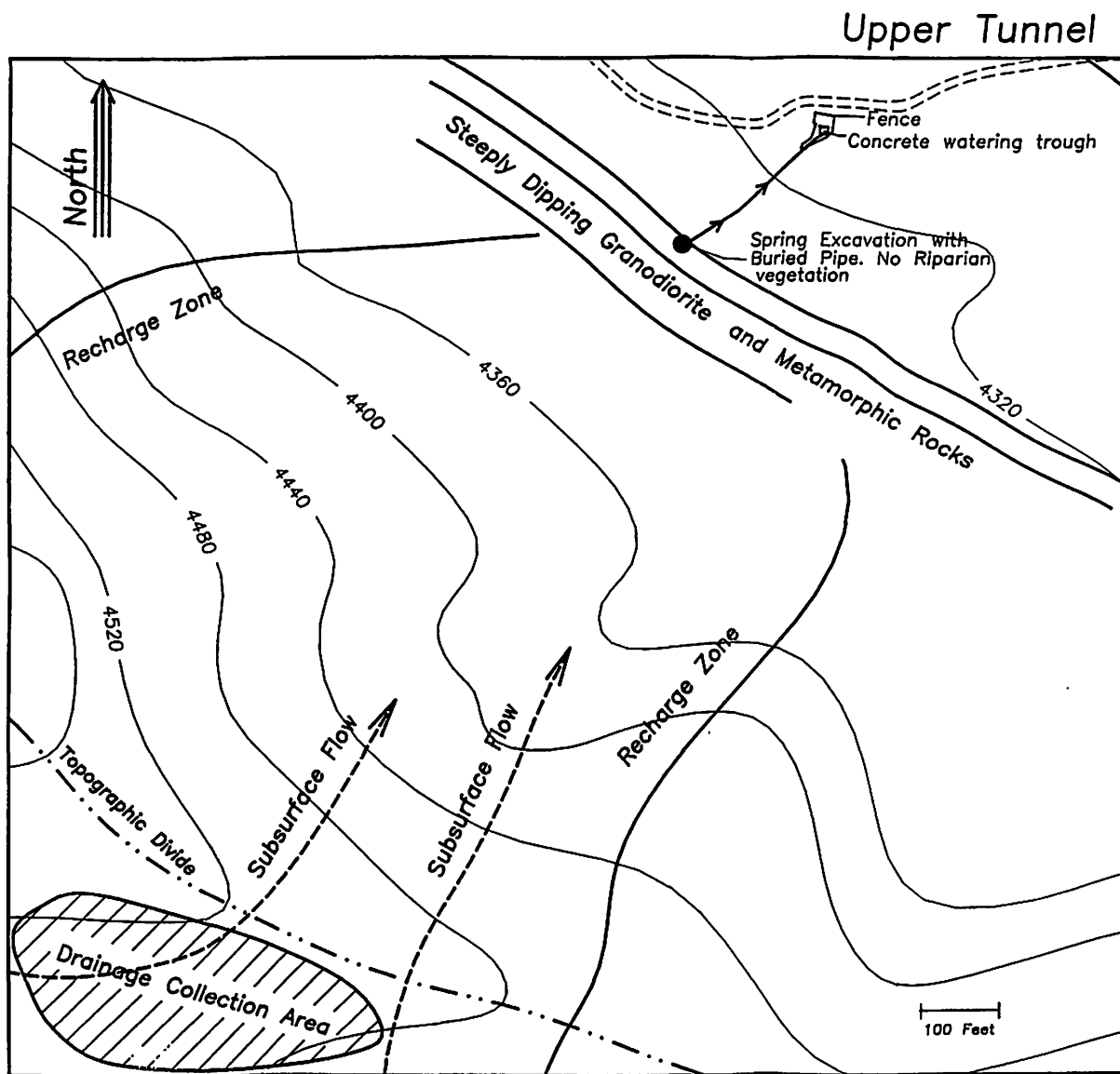
- 5640 — Ground contour
- - - - - Dirt road
- granodiorite  
Alluvium Geologic contact
- . . - - Intermittent stream
- - - - - Fault plane, dipping toward symbol
- - - - - Flowing surface water or pipe
- Resistivity profile showing curve of resistivity
- Arroyo willow
- Alluvium

## Notes

Contour Interval is 20 feet  
Scale 1" = 100'

File: Tenes-6 3/17/94

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### Legend

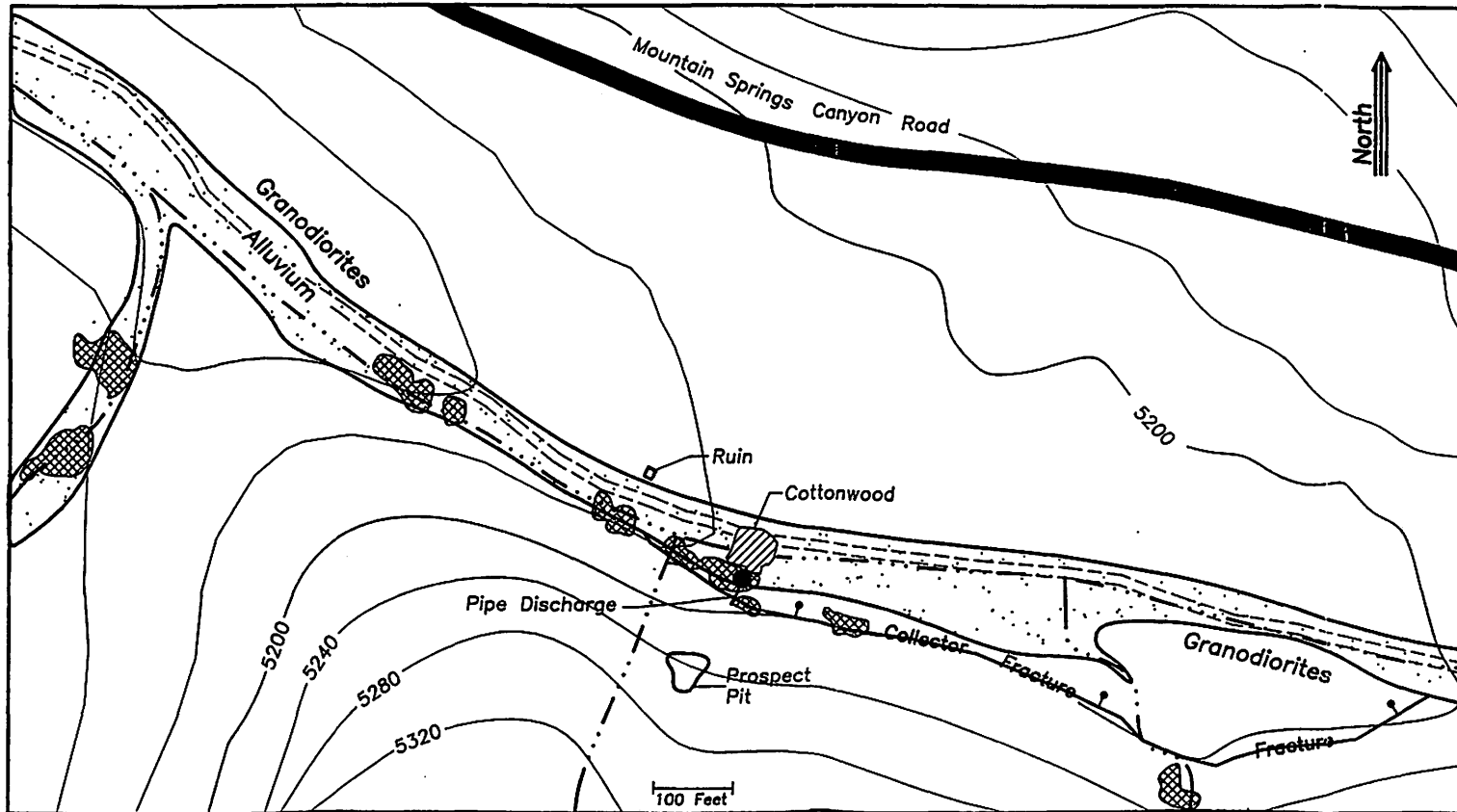
- 5640 — Ground contour
- - - - - Dirt road
- granodiorite Geologic contact
- Alluvium
- . . - - Intermittent stream
- . . . . Fault plane, dipping toward symbol
- - - - - Flowing surface water or pipe
- - - - - Resistivity profile showing curve of resistivity

### Notes

- Contour Interval is 40 feet
- Scale 1" = 150'

File: Uptunn-4 3/17/94

# Wild Rose Mine



## Legend

- 5840 — Ground contour
- == Dirt road
- granodiorite / Alluvium Geologic contact
- . - . - Intermittent stream
- / - Fault plane, dipping toward symbol
- Flowing surface water or pipe
- Arroyo willow
- Alluvium

## Notes

Contour Interval is 40 feet  
Scale 1" = 150'

File wildros-4 3/17/94

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