

ON THE INSIDE

MILFORD, UTAH SOIL MERCURY SURVEY

HISTOGRAM

STATION LOCATION MAP

MERCURY ANALYSIS AT MICROGEOPHYSICS

SELECTED MERCURY BIBLIOGRAPHY

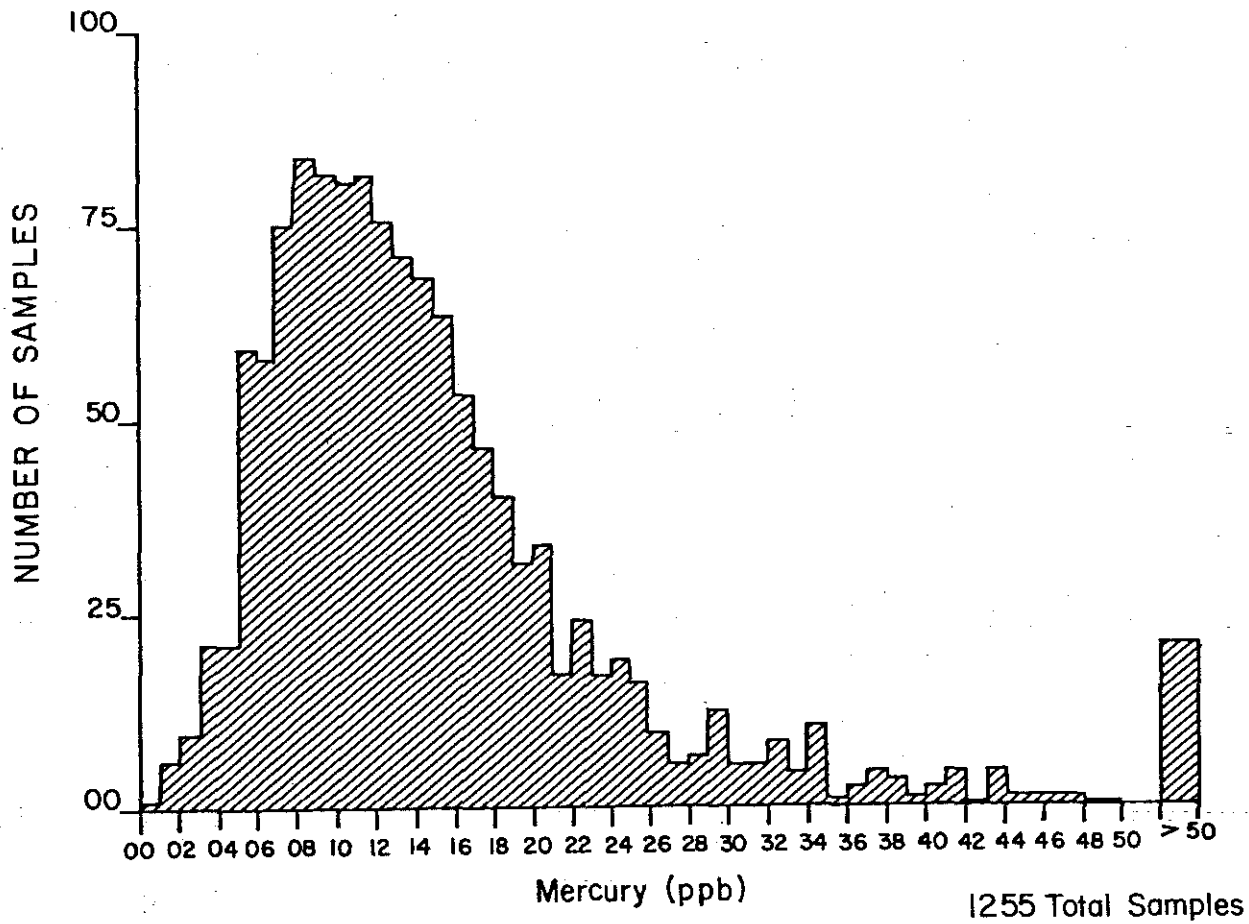
SNAKE RIVER DOWNWARP BY

INTEGRATED GEOPHYSICAL TECHNIQUES

AREA OF SURVEY MAP

ANALYSIS FOR MERCURY IN SOIL MILFORD, UTAH AREA

Drawn BY: MAP Date: 8/14/79 Drawing No: MQ-108 Checked By:



MERCURY ANALYSIS CAPABILITIES OF MICROGEOPHYSICS

The mercury analysis department at MicroGeophysics utilizes Jerome Model 301 gold film mercury detectors and Mettler PB30 top-loading balance. Samples in amounts down to $0.001 \text{ g} \pm 0.0005 \text{ g}$ can be analyzed with a detection limit of 0.5 ng of mercury.

With over 3,000 hours experience operating the Jerome Instruments, MicroGeophysics has developed techniques necessary to obtain reproducibility of results based on mercury concentration.

Gold film mercury detectors, such as the Jerome Instrument, must have a filtering system for removal of chlorides and sulfides. The improved MicroGeophysics filtering system provides for more effective removal of these compounds which, used in conjunction with cross referencing the instruments, has increased the reproducibility to a consistent $\pm 5\%$ at the 95% confidence level for samples in the 25-200 ppb range.

The following bibliography is included to help provide an overview of some of the areas in which the analysis of mercury concentration has proved useful.

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INTEGRATED GEOPHYSICAL TECHNIQUES APPLIED
TO THE SNAKE RIVER DOWNWARP, IDAHO

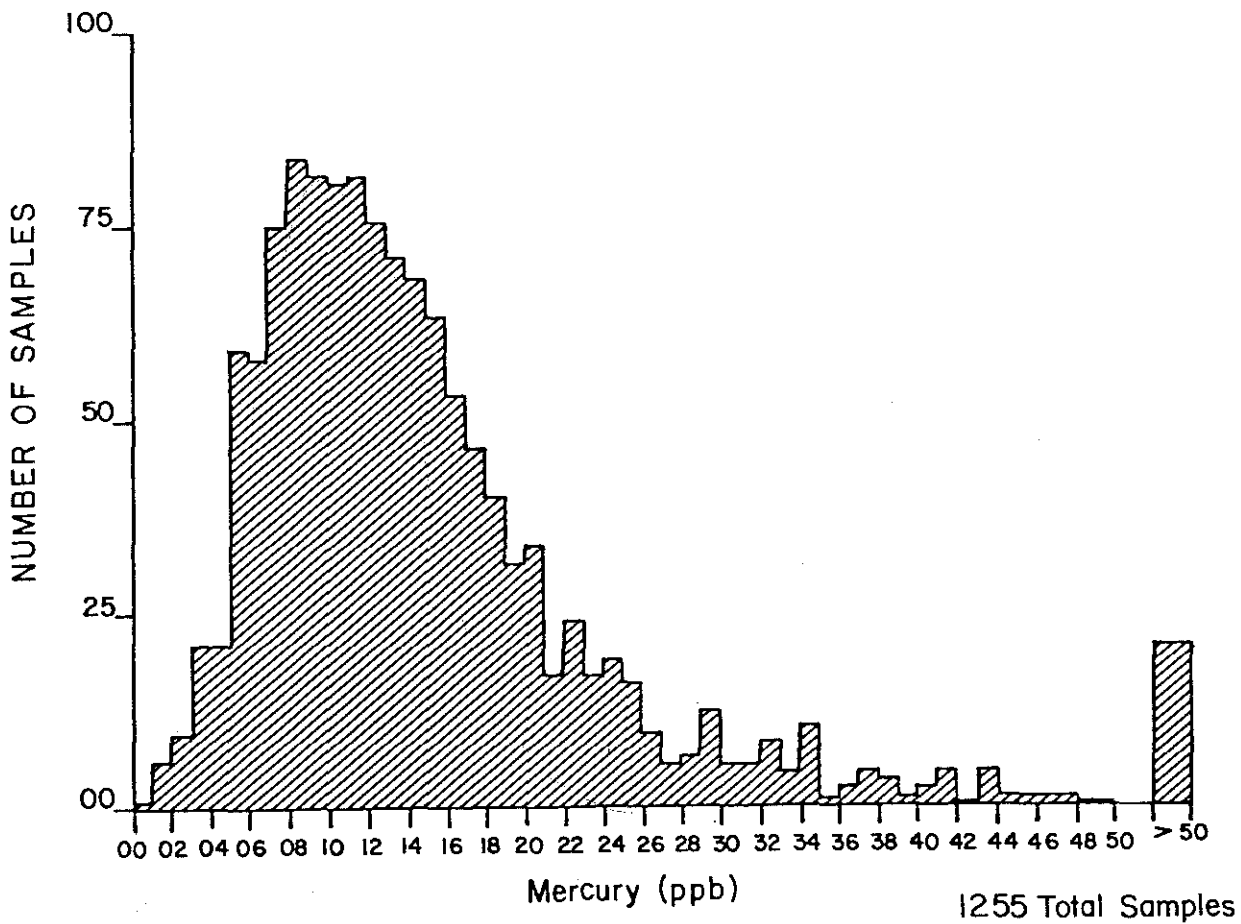
MicroGeophysics Corporation and EDCON are jointly offering an integrated geophysical package in the Snake River Downwarp area of Idaho shown on the index map. The objective of this project was to regionally map "basement" beneath the Snake River Downwarp. The "basement" mapping determined the extent of thrusting underlying the Snake River Plain for petroleum considerations and allowed a good assessment of any geothermal considerations. The integrated geophysical package combines seismic P-wave delay, regional gravity and magnetic data into an integrated interpretation.

In mid-September, 1978, the University of Utah and Purdue University performed a seismic refraction experiment in which large explosive charges (up to 8000 lbs.) were shot on the axis of the Snake River Downwarp. Five of these shots were utilized by MicroGeophysics in a P-wave delay analysis resulting in substructure interpretation to a depth of more than 20 km.

The configuration of the MicroGeophysics seismic survey provided for (1) three shots to be monitored from an L-shaped, reflection type geophone array (near station 107 on map) with a group interval of 1000 ft. and (2) all five shots to be recorded on portable seismographs set up in a grid fashion over the remainder of the area. The seismic interpretation was thus in terms of three-dimensional wave-fronts rather than the

ANALYSIS FOR MERCURY IN SOIL MILFORD, UTAH AREA

Drawn BY: MAP Date: 8/14/79 Drawing No: MQ-108 Checked By:



subject

**MICROGEOPHYSICS
CORPORATION**

June 8, 1979

SUBJECT: Soil-Mercury
Measurements in Utah

Dear Sirs:

Soil mercury analysis has been proven effective in geothermal and mineral exploration. Enclosed you will find a station map for a soil-mercury survey which is for sale by MicroGeophysics Corporation. Mercury mobilized by thermal phenomena or mineralization is trapped by the cooler organics in the soil layer and thus is an indicator of recent tectonic, mineralizing or thermal phenomena. Background soil-mercury levels are 5-15 ppb and anomalies are typically 3-100 times the background. Measurement uncertainties are 3-4 ppb. We refer you to the attached bibliography should you be unfamiliar with applications of these surveys.

Should you wish to purchase the survey, you will receive

1. Station map at scale of 1:62,500 with soil-mercury values plotted at each station.
2. Contoured map at same scale with stations marked.
3. List of Station co-ordinates and mercury values.
4. A histogram of number of samples vs mercury values.
5. High-pass filtered map.
6. Lo-pass filtered map.

These data will be released simultaneously to all participants; release date is presently planned for 31 August, 1979. Cost of these data to each participant is \$3,500.00 if a purchase order is received before 1 July. Thereafter, the price is \$4,000.00 for the data set. These data are company confidential to the extent outlined in the enclosed letter agreement. These prices represent about 25% of the acquisition costs on a proprietary basis.



MicroGeophysics Corporation is very interested in conducting exclusive or speculative soil-mercury surveys in any area of the western United States. We invite your nomination of specific areas and would be happy to prepare a proposal for your consideration.

Enclosed you will find a letter agreement for this work, a bibliography on soil mercury, a brochure about other services of MicroGeophysics and a nominal station map of the survey. Should you have questions about this survey or others, please do not hesitate to contact MicroGeophysics for information.

Sincerely yours,

Bob Quillin

Bob Quillin
Manager
Geothermal Division

BQ/tw

Encl.

NONEXCLUSIVE DATE AGREEMENT:

Purchase of a license to use soil mercury data and analyses data to be acquired in the Milford Area of Utah.

Gentlemen:

This letter sets forth the terms and conditions of the purchase of a license to use soil mercury data and analyses acquired by MicroGeophysics Corporation, hereinafter referred to as MGC, in a central Utah soil mercury survey.

hereinafter referred to as COMPANY agrees to purchase a license to use the survey data under the terms and specifications set forth below.

I. Description of Area and Station Locations

More than 1000 soil samples from stations shown on the accompanying survey location map will be analyzed for mercury by the gold foil absorption process. Stations will be near roads and trails though soil will be collected from undisturbed areas. A nominal 1.0 km station spacing will be used.

II. Sample Acquisition and Mercury Measurement


Samples will be acquired from small holes dug away from man made construction or creek drainages. Sample sites will be located on the smallest scale maps available for the area. Samples will be dried and sifted and the mercury content measured using the manufacturer's specifications for a Jerome Instrument Corporation mercury analyzer.

Lab technique includes frequent checking of instrument performance using prepared standards and blind duplication of analyses at set intervals.

III. Deliverables

MGC will deliver the following materials to the COMPANY:

1. Map at 1:62,500 scale containing station location markers annotated with the measured mercury value taken at that site.
2. An overlay for the above map with contours at appropriate intervals.

- 
3. A list with X-Y coordinates of the stations and the mercury values at the listed station.
 4. A histogram of numbers of samples vs mercury values.
 5. A high-pass filtered contoured map.
 6. A low-pass filtered contoured map.

The cut-off frequencies for the filters listed above will be chosen by the geophysicist in charge of the project.

IV. Data Delivery

Deliverables listed above will be released simultaneously to all participants who have committed to the project before the date of release. The date of release is 60 days after completion of the field work. In the event that the field work is not completed before 1 August, 1979, COMPANY may pull out of the survey by telephoned notice to the offices of MGC followed by written notice mailed within 48 hours. In the event of cancellation, 10% of the monies will be retained by MGC in compensation for effort on COMPANY's behalf.

V. Payment

Payment shall be in two parts. Fifty percent of the purchase price shall be due and payable within 30 days of signing of this letter of agreement. Fifty percent of the purchase price shall be due and payable within 30 days of the transmission of the deliverables to COMPANY.

VI. Nonexclusive Data Agreement

It is understood that this agreement is a license to use soil mercury data and that COMPANY, as LICENSEE, agrees to the additional terms and conditions listed below.

1. The LICENSEE agrees that the information acquired by it hereunder will be retained for its sole use and will not be sold, given away or used as the basis for future trades. It is further agreed that all rights regarding future trades or license to use the data shall remain with MGC.
2. Such data may be shown to a consultant for analysis and interpretation only.
3. Such data may be shown to other parties in the event that the LICENSEE wishes to interest other parties to enter an agreement to explore, operate, or develop the area

involved. In such event, such other parties shall agree in writing that such data are confidential and are not to be divulged to others.

4. MGC makes no warranty whatsoever, either expressed or implied, with respect to any of the data covered. Any reliance thereon by the LICENSEE or such third parties to whom may be shown the data under the terms of this license-to-use shall be at the sole risk and responsibility of the LICENSEE or such third parties.
5. This license to use can be terminated by mutual agreement of the parties after twenty (20) years from the date of this agreement. Upon such termination all data furnished to the LICENSEE by MGC hereunder shall promptly be returned to MGC.
6. It is agreed that this license to use the subject data is complete as stated herein and carries no obligation on the part of either MGC or the LICENSEE with respect to any future licenses to use data between them.

If the above terms and conditions meet with your approval, please sign and return the attached copy to MGC.

MICROGEOPHYSICS CORPORATION

Paul Larry Brown, President

PLB/tw

AGREED:

Date

LICENSEE

By

MICROGEOPHYSICS

SELECTED BIBLIOGRAPHY:

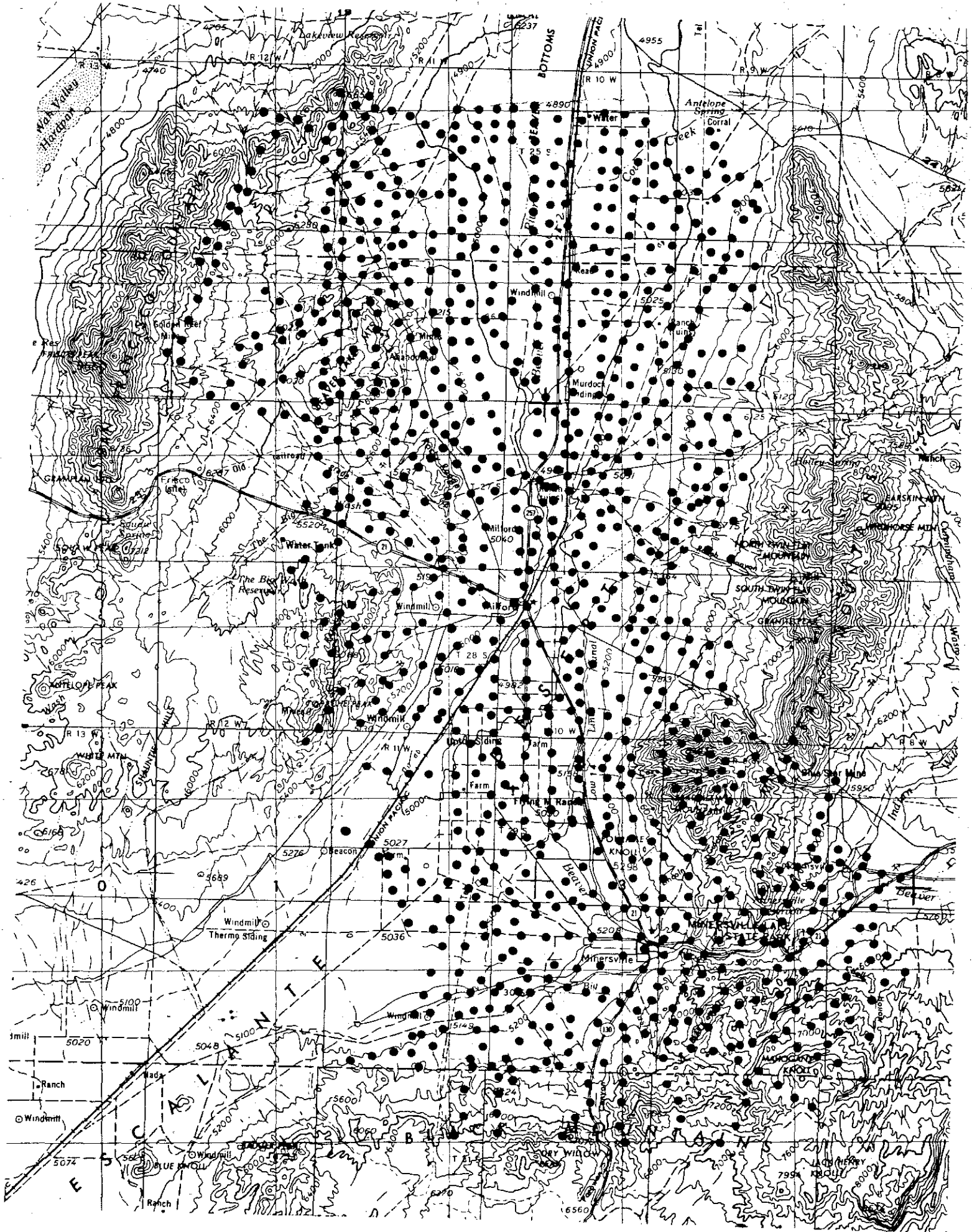
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* Xerox copies available upon request.
Dept. SM
MicroGeophysics Corporation
10900 W. 44th Avenue
Wheat Ridge, CO 80033



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[Handwritten initials]



MICROGEOPHYSICS
CORPORATION

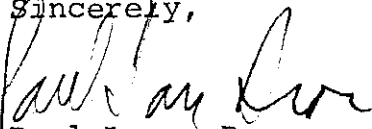
June 19, 1979

SUBJECT: Soil-Mercury
Measurements in Utah

Dear Sirs:

The recent mailing of the soil mercury measurements from MicroGeophysics had a station map that was in error. The corrected map is enclosed. If any modification to the coverage is needed please feel free to call to discuss any possible changes or additions.

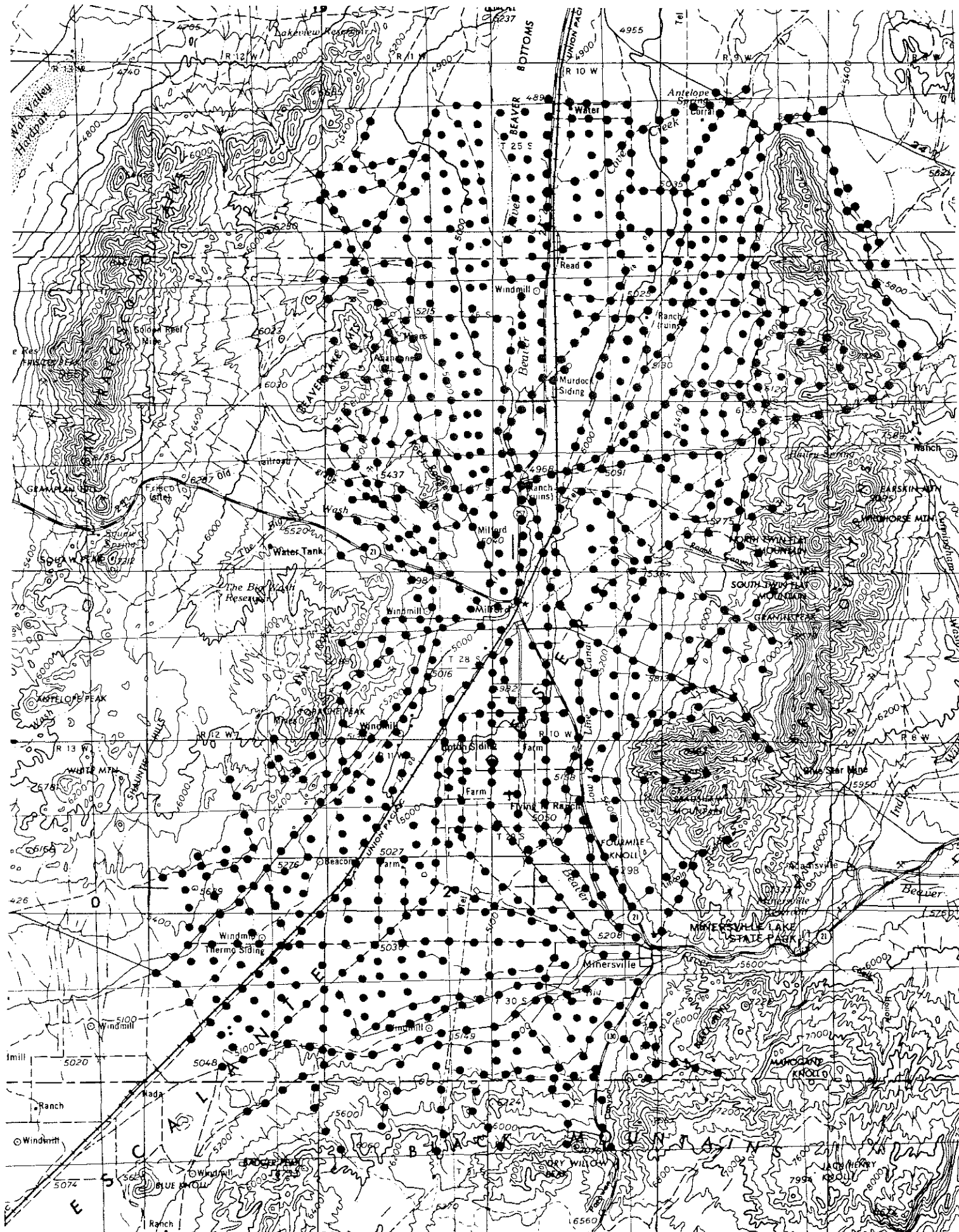
Sincerely,

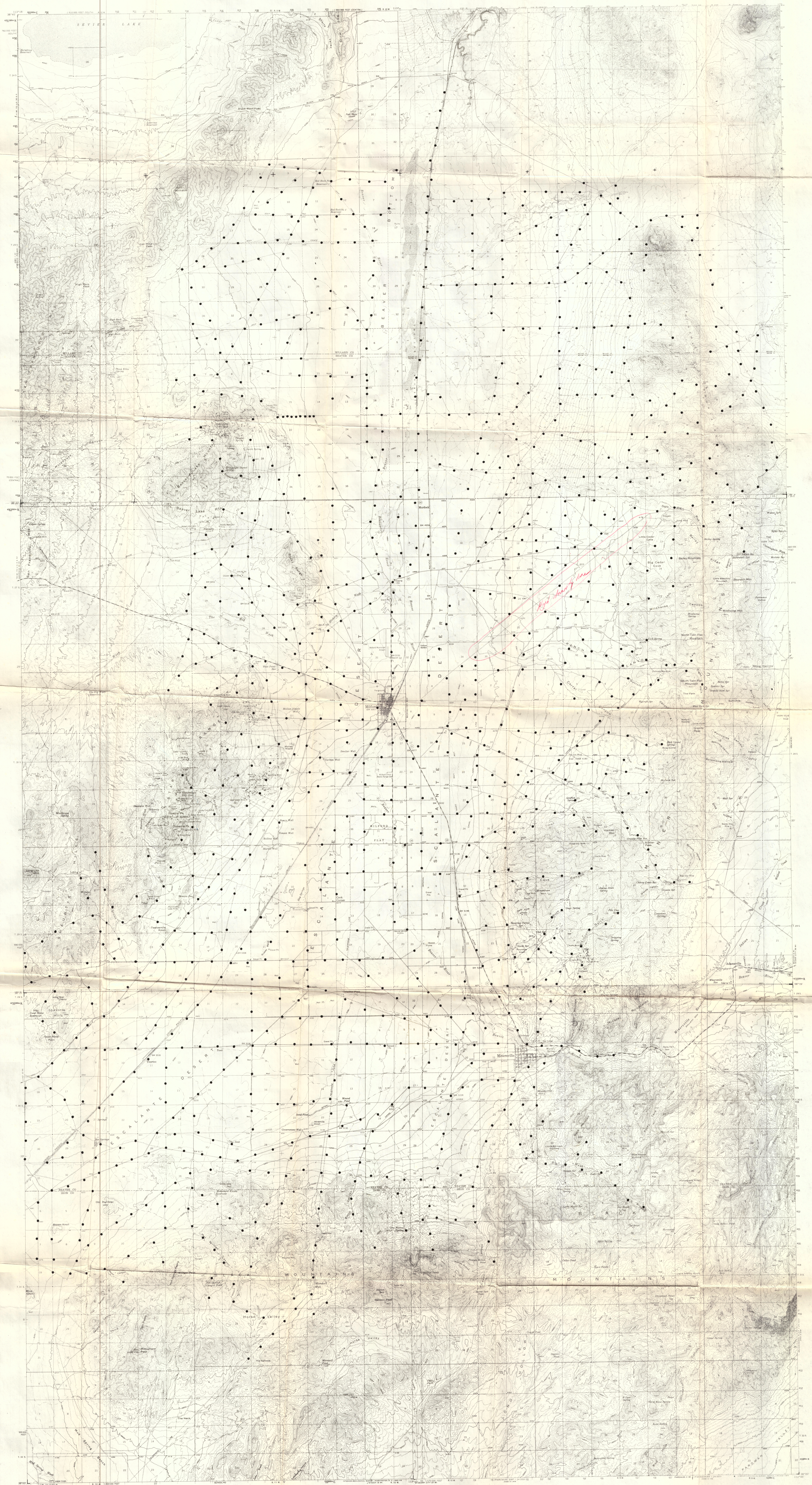


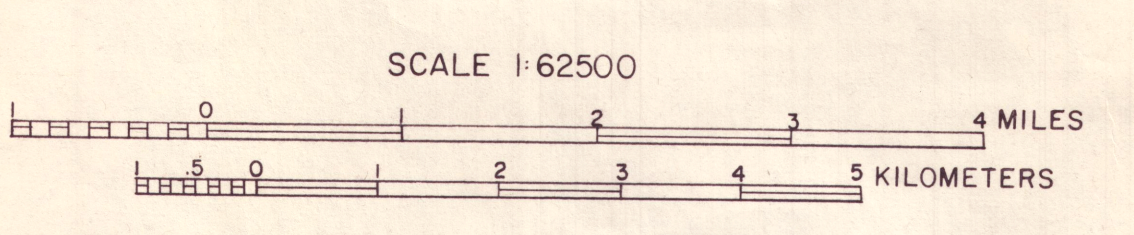
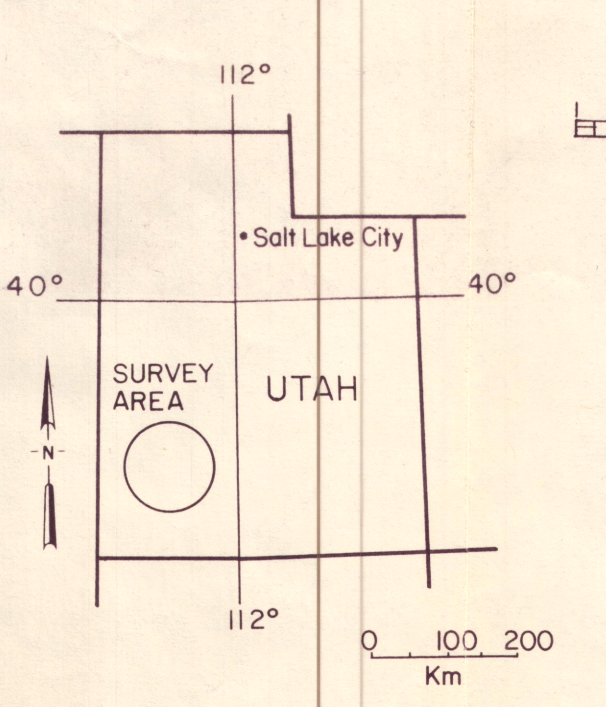
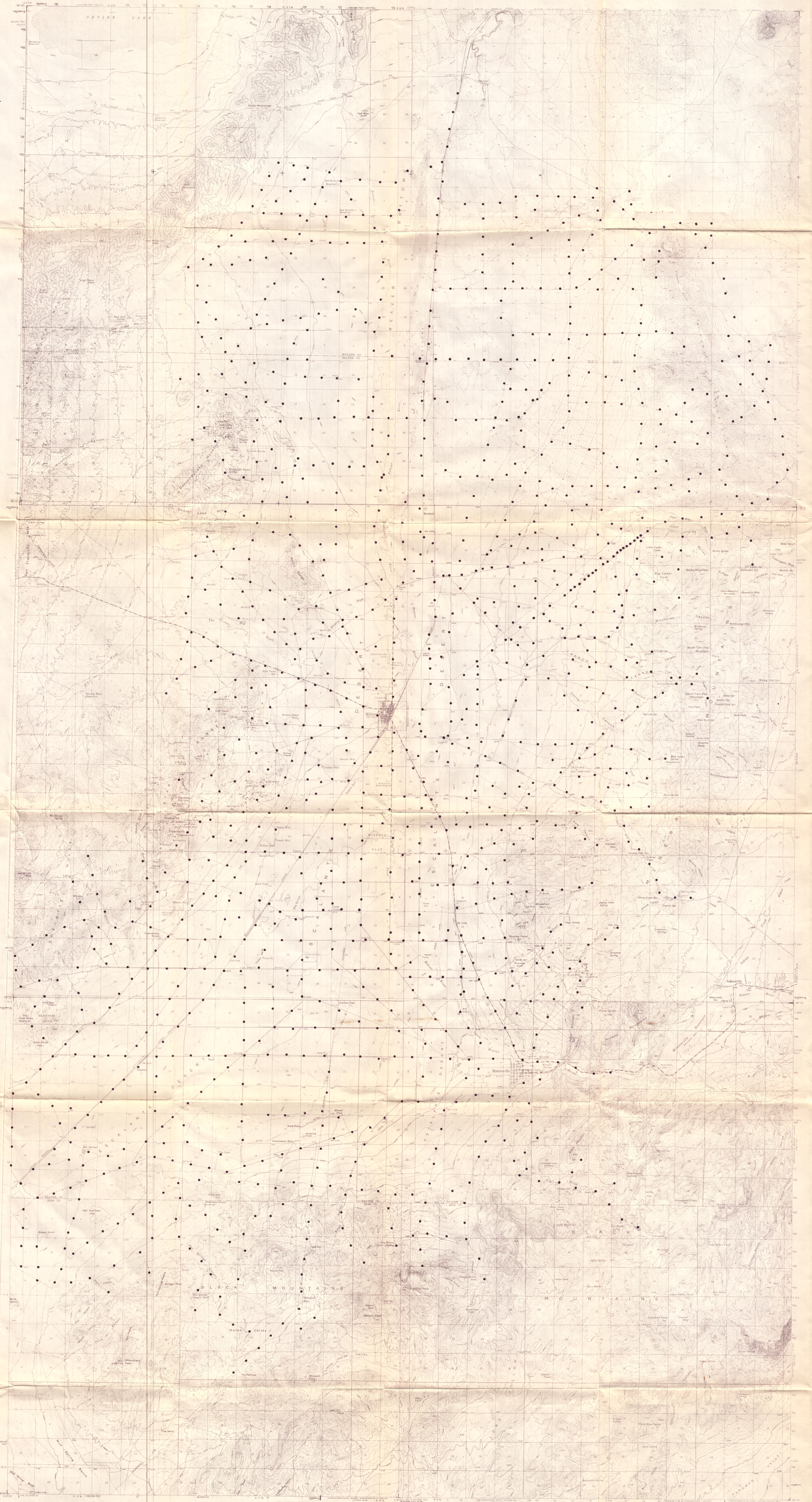
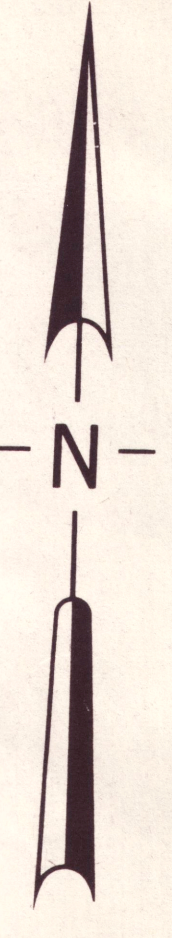
Paul Larry Brown
President

PLB/tw

Encl. (1)







MILFORD, UTAH PLATE 2
MERCURY SURVEY STATION LOCATION MAP
STATION LOCATION
SCALE = 1:62500
Corporation Officer _____ Geophysicist _____
DRAWN BY MAP 8/24/79
MicroGeophysics Corporation