Department of Energy
Yucca Mountain Site Characterization
Project Office
P. O. Box 98608
Las Vegas, NV 89193-8608

WBS 1.2.3
QA: N/A

SEP 16 1993

Robert R. Loux
Executive Director
Agency for Nuclear Projects
State of Nevada
Evergreen Center, Suite 252
1802 North Carson Street
Carson City, NV 89710

THE NONPROLIFERATION EXPERIMENT (NPE): ADDITIONAL INFORMATION ON YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT (YMP) TESTING (SCP: N/A)

References: (1) Ltr, Loux to Gertz, dtd 7/6/93
(2) Ltr, Gertz to Loux, dtd 7/29/93
(3) Ltr, Loux to Gertz, dtd 8/25/93

I welcome this opportunity to provide you with additional information on YMP activities associated with the NPE, formerly the Chemical Kiloton Experiment (CKE), as part of our continuing dialog on this topic (references 1 and 2), and to respond to your recent letter (reference 3).

YMP funded testing associated with the NPE will be conducted by James N. Brune and his associates from the University of Nevada, Reno (UNR). These YMP/UNR activities will focus on the gathering of refraction data (upper and middle crustal depths) in the vicinity of Yucca Mountain (enclosure). These data will be used to identify upper crustal velocity anomalies (if any exist) in the Yucca Mountain area. Due to several unresolved scheduling and contracting issues, some aspects of the proposed UNR/YMP testing program remain tentative. These maps and test summaries (see enclosure) provide our latest plans for the UNR field team. The NPE test will be conducted (and the UNR team will record the event) on the morning of September 22, 1993, as scheduled.

While strong-motion type instruments will be used to record first arrivals, gathering strong motion data is not the focus of the UNR experiment and associated monitoring activities. Over the past ten years, the project has deployed an array that has gathered surface and subsurface strong motion data from underground nuclear explosions. A substantial data set exists, and final analysis of the information and development of an empirical ground motion model will be developed (Study 8.3.1.17.3.3) for YMP by Sandia National Laboratories.

YMP-5

Ltr. Encl.

ADD: B.J. Youngblood 1 1

102.8
WM-11
NH03

Much attention has been focused on the NPE/CKE test by YMP oversight groups. The U.S. Geological Survey (USGS) and UNR initiated planning for YMP testing activities during June 1993. UNR has coordinated with other research groups planning geophysical studies in association with the NPE. UNR is coordinating with researchers involved in the "Sierra Experiment," a project designed to resolve the deep structure of the Sierra Nevada of eastern California and western Nevada. This has enabled UNR to participate in highly cost-effective data collection efforts on behalf of the Yucca Mountain Site Characterization Project Office (YMPO). This activity will be conducted as part of UNR's ongoing seismicity monitoring program under approved Study Plan 8.3.1.17.4.1, Historical and Current Seismicity. Neither job packages nor test planning packages are required for these tests.

As mentioned in our letter (reference 2), the UNR team will be collecting information to augment and enhance the data gathered from the NPE/CKE. An 8000 pound shot (typographical error, reference 1, stated 800 pound shot) is planned to be located in Amargosa Valley, and was scheduled to be recorded by the UNR group. Scientific, logistical, and safety considerations resulted in changes to the UNR proposed recording program. Currently, UNR planning includes recording the NPE shot and a 3000 pound shot to be located near Ryan, California (enclosure). The Ryan locality charge will be placed in a 150 foot deep, 9 inch diameter cased borehole. In addition to recording the NPE, UNR has selected to record the Ryan shot because it is more ideally located for the reverse refraction experiment than the Amargosa shot locality.

Due to difficulties with contractor drilling schedules for the Sierra Experiment, completion of drilling may be delayed for the various shotholes. Thus, the mid-September test window for recording both the NPE and Sierra planned shots may be missed by participant organizations (including UNR). If this situation occurs, UNR/YMP will return to the field at some later date to complete the reverse refraction test. Additional UNR/YMP planning information is provided herein (enclosure).

You inferred that a cooperative arrangement with the Defense Nuclear Agency has been established by YMPO (reference 3). No such agreement exists. YMP utilization of information derived from data gathered "by other groups during the CKE" will be necessary. Results of testing being conducted by various university groups and the USGS (the "Sierra Experiment") will be available in the literature at some future date. Several YMP scientists are involved (but not funded by YMP) in the NPE and "Sierra" experiments. Thus, results of these described activities will be indirectly available to YMP. The Sierra and UNR tests are scheduled to coincide with the NPE in order to maximize use of resources.

Once the "Sierra Experiment" data are published, YMP will make use of the information just as with all other pertinent published information available in the open literature. Should YMPO determine that results of the "Sierra Experiment" constitute vital input to a

potential license application, then YMPO will proceed with a qualification exercise on those data. YMPO will reference and make use of all pertinent available existing information in the site characterization and license application process.

In reference 2, we also discussed the reflection seismic program (currently planned for acquisition during fiscal year 1994). Crustal velocity information will be obtained from that experiment. Similarly, the subject letter made reference to the Southern Great Basin Seismic Network, UNR portable seismic stations, in addition to discussion of any velocity information derived from the NPE testing and associated UNR reverse refraction profiling. These will be used to gather data in characterization of the shallow, intermediate, and deep crustal structure and velocity in the area of Yucca Mountain. This does not preclude additional future geophysical testing for purposes of characterizing crustal structure or velocity in the vicinity of Yucca Mountain.

Finally, let me clarify my prior comments regarding the technical adequacy of the UNR/YMP NPE experiments. The program discussed above and in my prior letter (reference 2) should provide valuable data regarding the shallow, intermediate, and deep crustal structure and velocity in the area of Yucca Mountain. There is no expectation that the UNR/YMP NPE experiments will, by themselves, resolve all questions regarding crustal structure in the vicinity of Yucca Mountain. However, when considered in the context of other future planned activities such as the reflection seismic program, the scientific drilling program, and monitoring of an upgraded seismic network, we believe an adequate understanding of crustal structure in the area of Yucca Mountain will be developed to meet our site characterization needs. This context is the basis for our statement in reference 2 that "the above described testing programs are believed to be adequate for purposes of characterizing subsurface structure and crustal velocities in the Yucca Mountain area." This in no way precludes the option of additional future geophysical testing, should that need arise.

I hope this letter clarifies the areas of concern expressed in your most recent letter (reference 3). Please direct questions to Mark C. Tynan at (702) 794-7940 or to me at (702) 794-7920.

for Carl P. Gertz
Project Manager

RSED:MCT-6052

Enclosure:
NPE Support Information

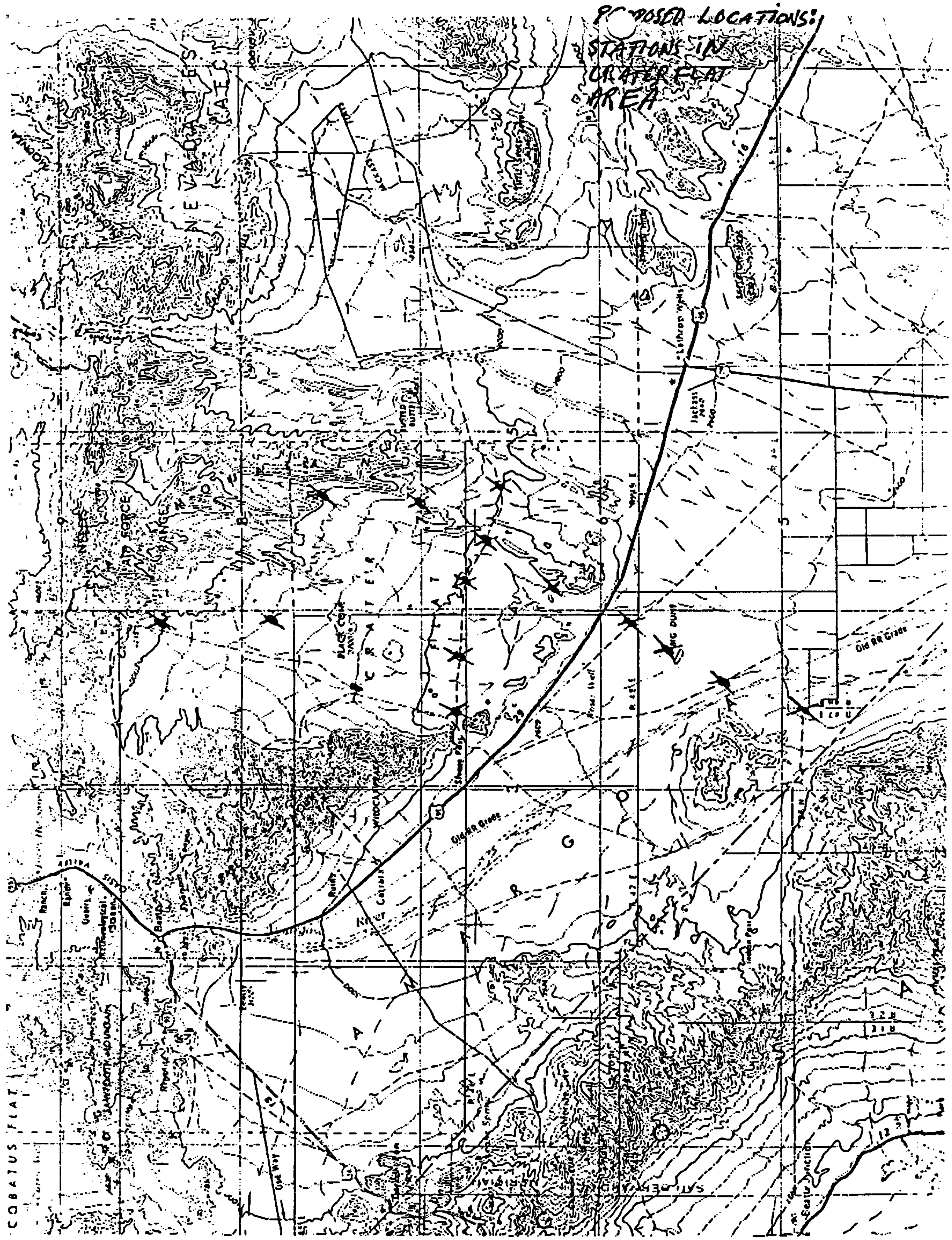
cc w/encl:
L. H. Barrett, HQ (RW-1) FORS
A. B. Benson, HQ (RW-52) FORS
R. W. Craig, USGS, Las Vegas, NV
D. L. Edwards, USGS, Las Vegas, NV
B. J. Youngblood, NRC, Washington, DC
D. W. Moeller, ACNW, Washington, DC
W. J. Hinze, ACNW, Washington, DC
J. E. Cantlon, NWTRB, Arlington, VA
J. D. Agnew, M&O/WCFS, Las Vegas, NV
B. E. Reilly, SAIC, Las Vegas, NV
T. W. Bjerstedt, YMP, NV
J. R. Dyer, YMP, NV
S. B. Jones, YMP, NV
J. T. Sullivan, YMP, NV
D. R. Williams, YMP, NV
A. C. Robison, YMP, NV

cc w/o encl:
CCRU (2)

1128

UNR/YMP SUPPORT INFORMATION REGARDING NPE TEST SCHEDULED FOR SEPTEMBER, 1993

ENCLOSURE


PROPOSED LOCATIONS:
STATIONS IN
CRATER FLAT
AREA
CRATER
FLAT
AMARGOSA
Old RR Grade
Old RR Grade
BIG DUNE
Lathrop Wells
COBATUS FLAT

United States Department of the Interior

NATIONAL PARK SERVICE
DEATH VALLEY NATIONAL MONUMENT
DEATH VALLEY, CALIFORNIA 92328

IN REPLY REFER TO:

N3021

September 3, 1993

Dr. Ken Smith
Seismological Laboratory/168
Mackay School of Mines
University of Nevada, Reno
Reno, Nevada 89557-0141

(702) 784-6613
FAX 784-1766

Dear Dr. Smith:

Thank you for your maps and letter of August 30 regarding proposed placement of 11 seismic stations in Death Valley National Monument. This is your Letter of Authorization to proceed with your seismic observation research as outlinod in your letter.

Your proposal calls for the deployment of 11 seismometers on September 16-17, 1993 to observe the seismic shots being detonated by another study, the Southern Sierra Nevada Dynamics Study by Dr. Peter Malin (principal investigator), Dr. Stanley Ruppert (permitting and logistics coordinator), et al. Your proposal also calls for the deployment of 11 seismometers in the same locations on September 21-22, 1993 to observe a one-kiloton chemical explosion, an experiment by the Yucca Mountain Project (Nevada Test Site).

Your project will involve placing recording seismometers in 11 previously disturbed locations along road sides, and taking readings of explosion echoes. Each site will have 1 to 3 seismometers, a recording instrument and a battery in a battery case. Some sites will have an antenna.

Seismometers may be buried in 2' diameter holes, 1' deep. All sites will be in disturbed road edges, and access will be by car or truck. No digging or ground disturbance may occur more than 1' from the graded portion of a road berm. If any historic or prehistoric cultural artifacts are uncovered, or any paleontological items uncovered, digging will stop and Jan Lawson, Park Archeologist, Resource Management Division, Death Valley National Monument will be notified.

Much of the field work will be done throughout the night. Vandalism of unattended equipment laid out all night is a known risk you have accepted.

Please provide a half-page lay summary of your project for our staff and the general public. Please provide the monument with 2 copies of any reports or publications resulting from your work in the monument. This project does not involve specimen collecting.

If you have any questions please contact Environmental Specialist Richard Anderson at (619) 786-3251, FAX 786-3258. Thank you.

Sincerely,

Edwin L. Rothfuss
Superintendent

Enclosures:
maps

cc: Stan Ruppert, Lawrence Livermore National Lab
Peter Malin, Geology, Duke University
Brian Wernicke, Geological and Planetary Sciences, CalTech

bcc:

Reading Files (DEVA)
Central Files (DEVA)
Chrono Files (DEVA)
SO Files (DEVA)
RM (DEVA)
Chief Ranger (DEVA)
Tom Gavin, Regional Minerals Coordinator (RN-WRO)
Kerry Moss, Branch of Mining and Minerals (MMB-WASO)

RM;RLA;rla;09/03/93;SMITH2.LTR;ext.251

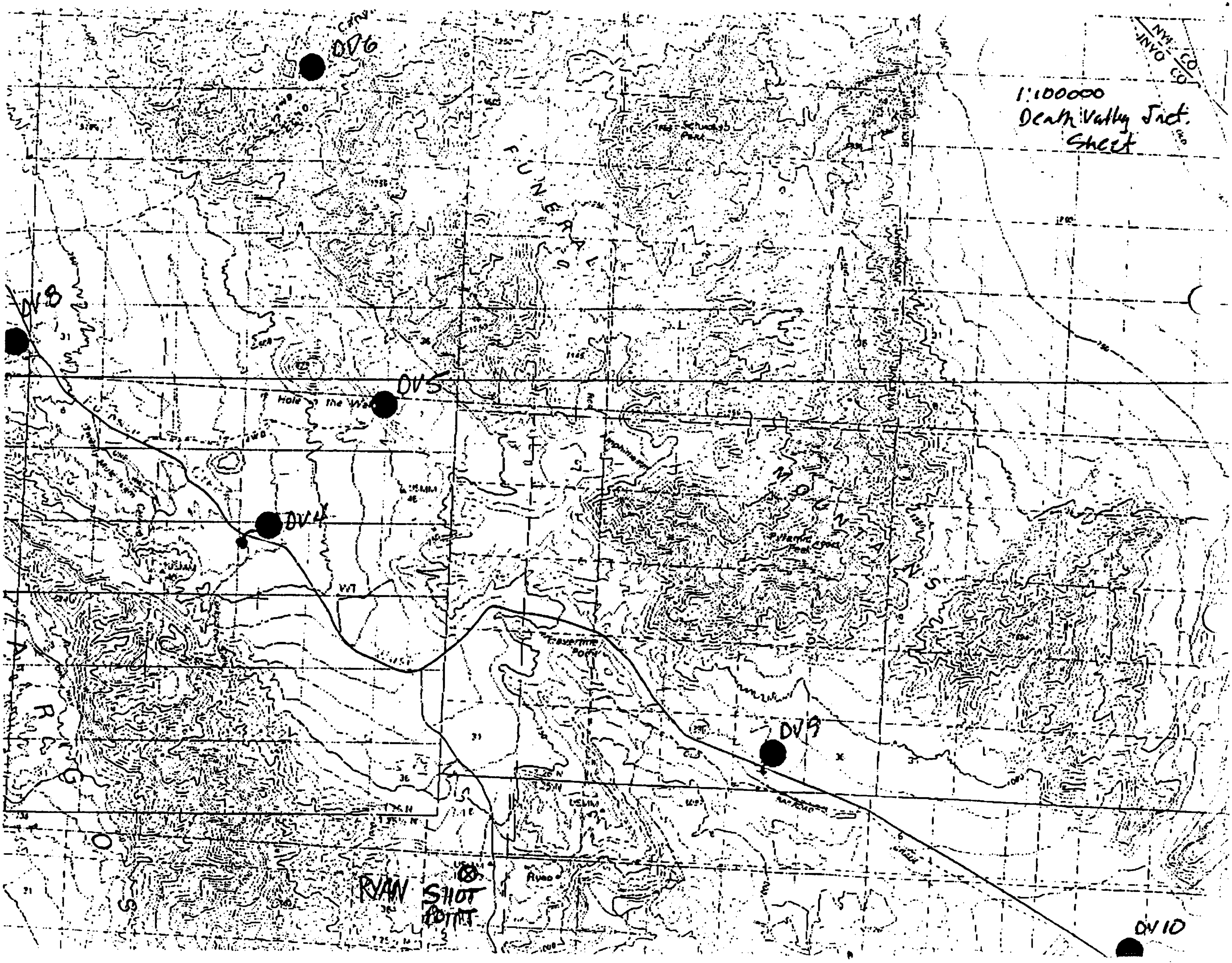
cc: and bcc: addresses:

Stanley Ruppert
L-202, Lawrence Livermore National Laboratory
7000 East Avenue
Livermore, CA 94550
(510) 423-7552
FAX 422-1002

Peter E. Malin
Department of Geology
Duke University
Durham, NC 27706
(919) 681-8889

Brian P. Wernicke
Division of Geological and Planetary Sciences
California Institute of Technology
Pasadena, CA 91125
(818) 356-6192
FAX 568-0935

Kerry Moss
Branch of Mining and Minerals
NPS-MMB
P.O. Box 25287
Denver, CO 80225-0287
(303) 969-2090
FAX 969-2822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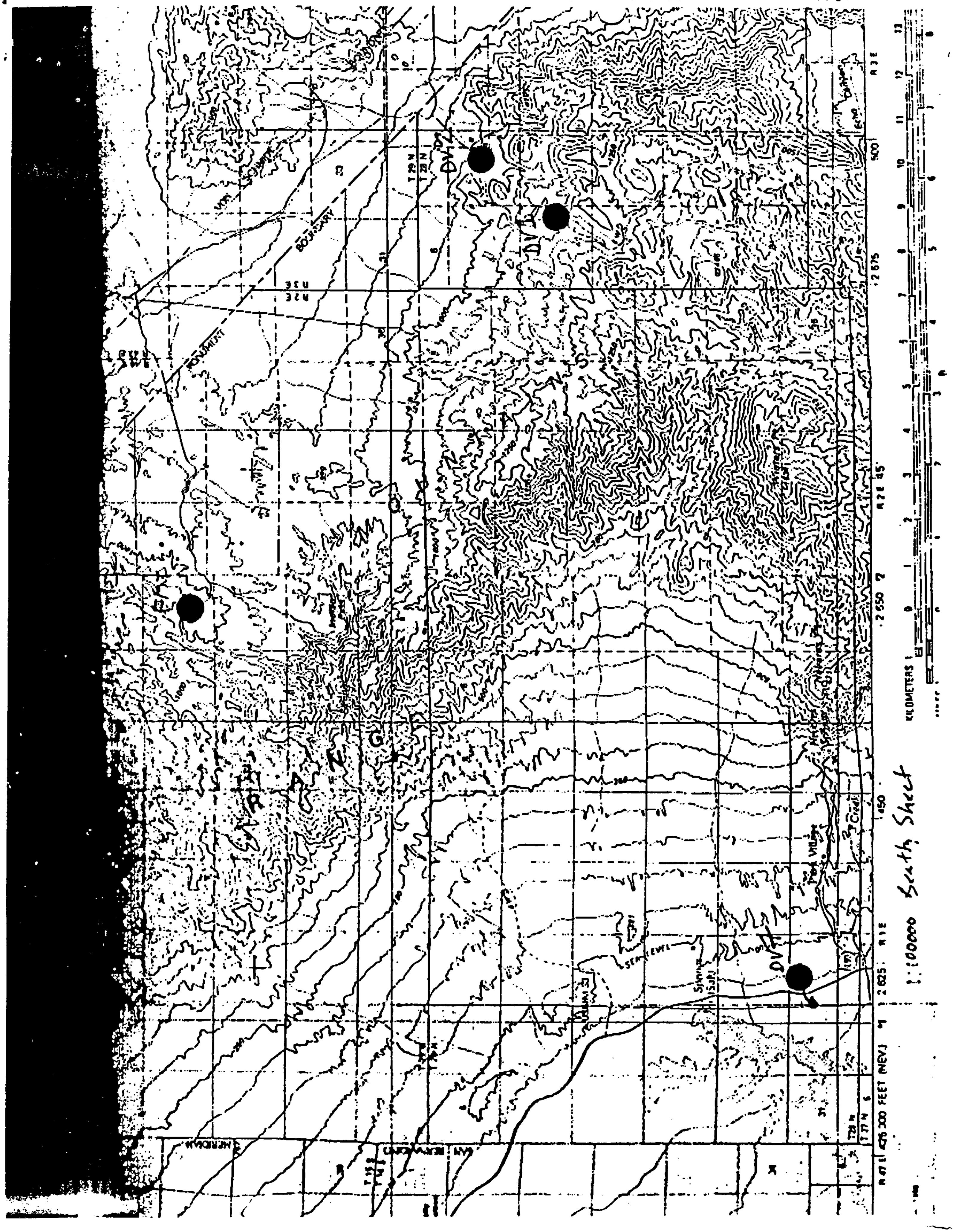
Death Valley Jct.
Sheet
NYE CO
INYO CO
FUNERAL
MOUNTAINS
DV6
DV8
DV5
DV4
DV9
DV10
Hole in the Wall
Travertine Point
RYAN SHOT POINT
Ryan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KILOMETERS
BOUNDARY
SEA LEVEL
DV
R A N G E
R 2 E
R 1 E

NPE-RYAN Reversed Refraction Profile - Station Permitting Request

The following is a list of proposed station locations for a refraction experiment planned for the night of September 21, 1993 (early morning hours of September 22, 1993). We will be recording two conventional explosions that evening; the NPE (Non-proliferation Experiment) and a 6,000-8,000 lb shot at Ryan, California. We have divided the deployment into two regions on NTS, the Jackass Flat Area (JF) and the Rainier Mesa Area (RM). Station locations have been determined from GPS coordinates and each site is marked with a 4 foot lath and blue and orange flagging.

Rainier Mesa Region

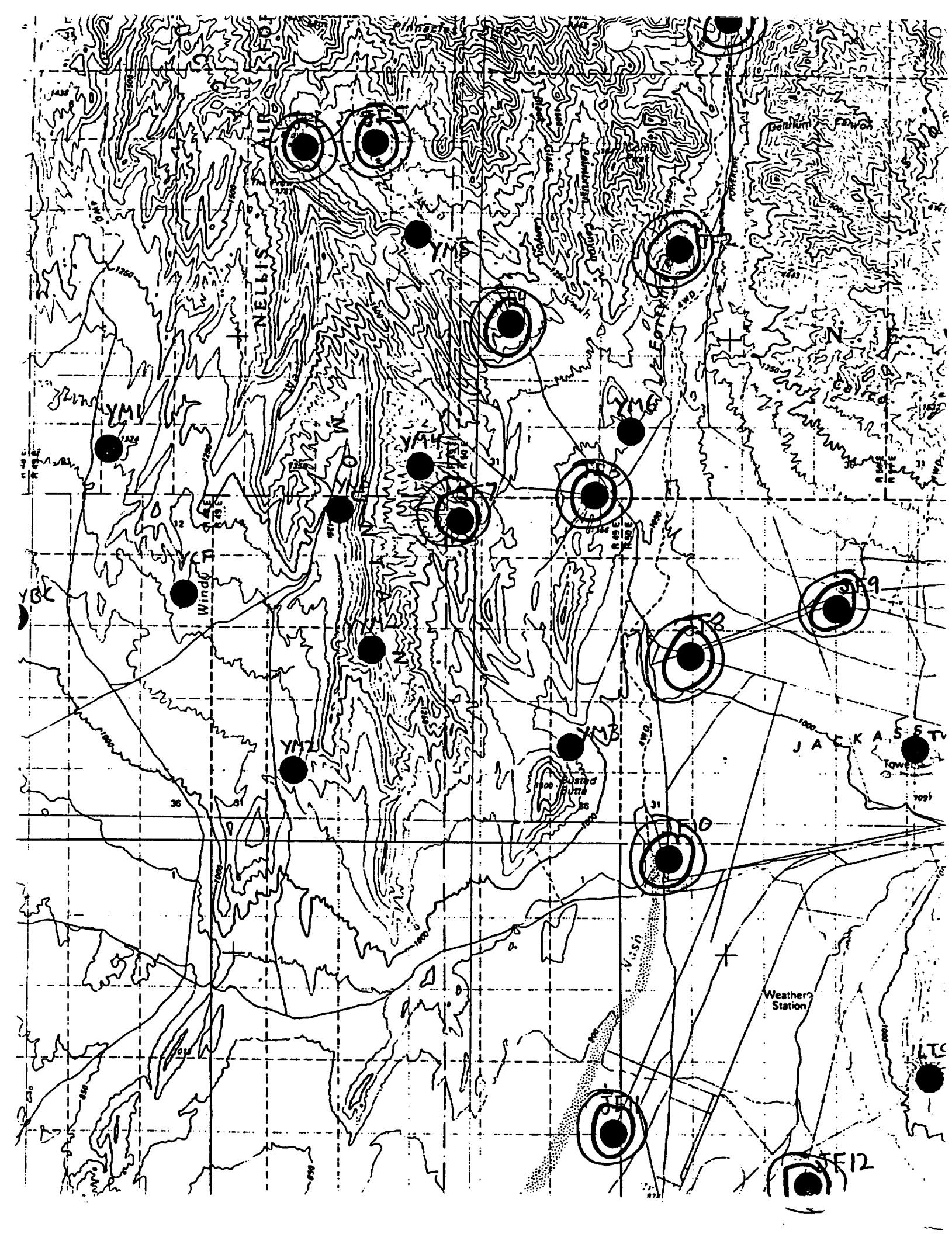
Station	Latitude	Longitude
RM1- Kawich Valley Road	37 19.80N	116 12.64W
RM2 - Big Burn Valley (Bend)	37 13.44N	116 16.50W
RM3 - Lamb's Canyon	37 16.86N	116 16.54W
RM4 - Road to Nellis 19c-19	37 19.00N	116 16.23W
RM5- Dead Horse Flat Road	37 19.62N	116 18.24W
RM6 - North of Dead Horse Flat	37 21.26N	116 18.75W
RM7 - Falcon Canyon	37 09.85N	116 17.67W
RM8 - North of Air Strip	37 07.27N	116 18.58W

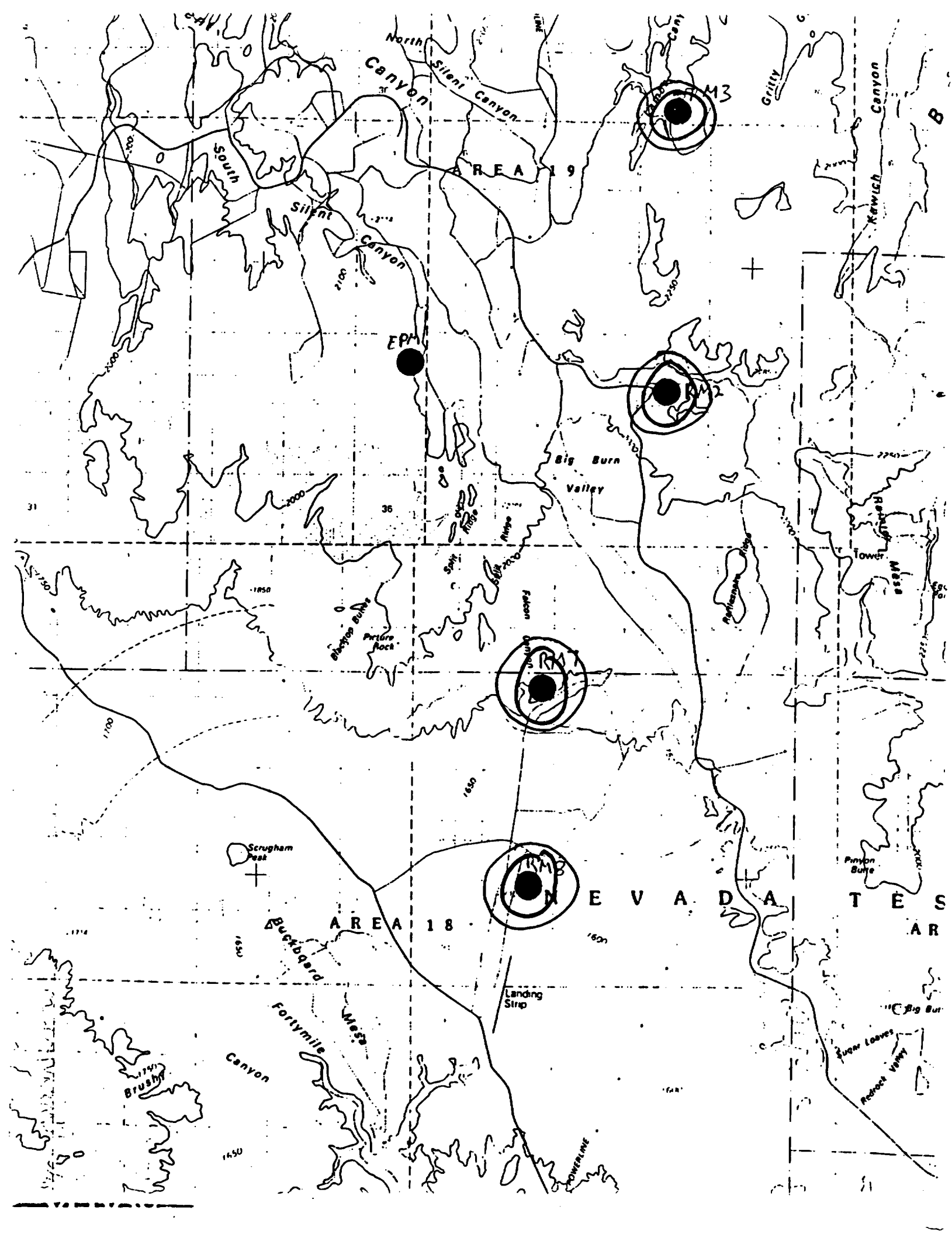
Jackass Flat Region

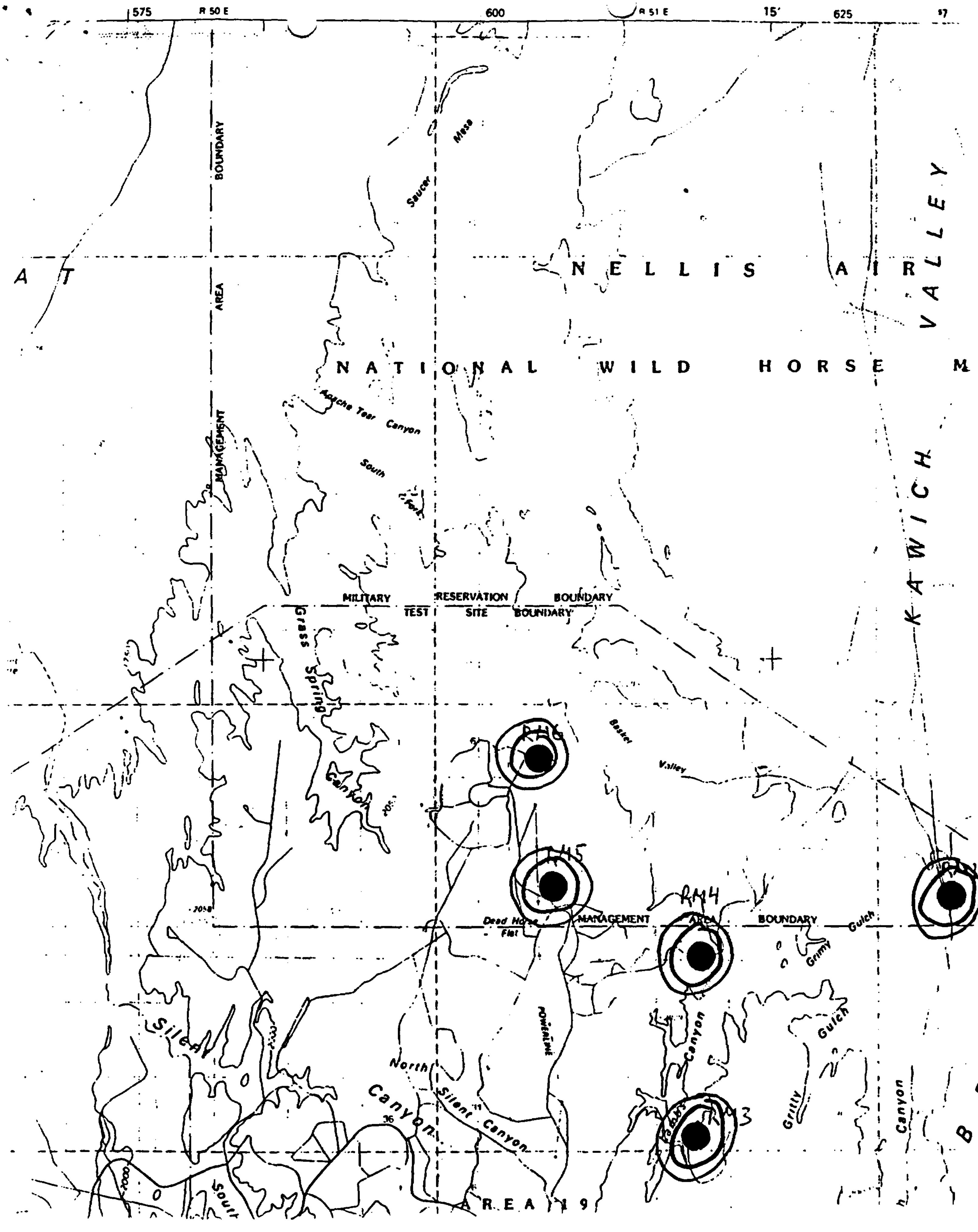
Station	Latitude	Longitude
JF1	36 56′ 32.1"	116 22′ 34.0"
JF2	36 53′ 32.5"	116 23′ 05.5"
JF3	36 50′ 30.0"	116 24′ 21.5"
JF4	36 52′ 34.4"	116 25′ 48.5"
JF5	36 54′ 50.3"	116 28′ 08.9"
JF6	36 54′ 48.0"	116 29′ 10.8"
JF7	36 50′ 19.6"	116 26′ 42.5"
JF8	36 48′ 39.9"	116 23′ 12.3"
JF9	36 49′ 12.5"	116 20′ 44.3"
JF10	36 46′ 03.6"	116 23′ 27.4"
JF11	36 45′ 06.4"	116 24′ 16.8"
JF12	36 42′ 53.5"	116 21′ 19.3"

Stations circled in Red - we would also like to put two additional stations along the line in the northern part of Forty Mile wash. The area was barricaded and we could not get access.

From Ken Smith - UNR


NELLIS
Weather Station


North Silent Canyon
Silent Canyon
South Silent Canyon
Grilly Canyon
Kawich
AREA 19
EPM
RM1
RM2
RM3
Big Burn Valley
Tower Mesa
Falcon Canyon
Scrugham Peak
AREA 18
NEVADA TEST
Buckboard Mesa
Fortymile Canyon
Landing Strip
Pinyon Butte
Sugar Loaves
Redrock Valley
Brushy
POWERLINE


575
R 50 E
600
R 51 E
15'
625
BOUNDARY
AREA
MANAGEMENT
Saucer Mesa
N E L L I S   A I R
N A T I O N A L   W I L D   H O R S E   M
Apache Tear Canyon
South Fork
MILITARY RESERVATION BOUNDARY
TEST SITE BOUNDARY
Grass Spring Canyon
Basket Valley
RM6
RM5
RM4
Dead Horse Flat
MANAGEMENT AREA BOUNDARY
Grimy Gulch
Silent Canyon
North Silent Canyon
POWERLINE
Canyon
Gulch
Grilly
Canyon
AREA 19
K A W I C H   V A L L E Y