

# *μ Geophysics Corporation*

March 15, 1976

Mr. Art Lange  
AMAX Exploration, Inc.  
4704 Harlan Street  
Denver, Colorado 80212

Subject; Deep refraction studies at Buena Vista, Colorado

Dear Art,

This letter proposes a program of deep refraction at the Mt. Princeton geothermal prospect near Buena Vista, Colorado. The objective of the program is to map the velocity and depth of the sub-sediment basement in the Upper Arkansas Valley. Knowledge of the depth of the basement and structure of the valley can aid in the evaluation of the geothermal potential of the area.

An estimated velocity and structural model for the Upper Arkansas Valley is shown in Figure 1. The layered section consists of a low-velocity top layer (alluvium with an assumed velocity of about 0.8km/sec) with a thickness of 10-100meters, a sediment layer (velocity estimated to be 2.5km/sec) with a thickness of about 0.4km, another sedimentary layer with a thickness of about 0.6km (velocity estimated at 3.0km/sec), and a final basement half-space (with a velocity estimated at 5.0km/sec).

The stated objective is to map the basement velocities and depth at various points throughout the prospect. Reversed profile refraction techniques can provide this mapping as is shown on the travel-time curves of Figure 2. Refraction arrivals from the basement are evident at offset distances of 4.0km or more.

The extent of the proposed survey includes approximately 25 km of profiling. The profiles include 11km of line from below Mt. Princeton to the east and 14km of north-south line across both Chalk Creek and Cottonwood Creek. The specific recommended locations are shown on Plate 1. The large open circles on Plate 1 are shot points and may be the site of several shot holes. Each source will be 6-10 pounds of explosive.

Though Plate 1 does outline a plan of activity, it should be stressed that a geophysicist in the field will make on the spot interpretations and will adjust the field procedure to obtain the most effective data set.

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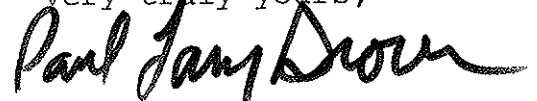
The field equipment for this survey includes a complete truck-mounted 24-channel seismic system. A drill rig for the shot-holes is also available. Costs for this effort are estimated to be:

I. Field Work/day	
A. Geophysicist.	\$150
B. Technicians (3)	225
C. Truck	25
TOTAL/DAY	\$400
II. Seismic Equipment/day	
A. Complete Seismic Truck	\$200
B. Drill,driller, and expendables	300
III. Office/day	
A. Geophysicist	100
B. Clerical and supplies	25

Productivity is better than 3km of continuous profiling per day. A day of office work per field day will be necessary to produce a final report. The full program outlined above will thus have a maximum total-cost of \$9000. Increases in productivity can be expected if the access to the area is good or if the geology is uniform so that line segments can be skipped and shot-points eliminated.

We would be pleased to begin work on this project at your convenience. Please call us if you need additional information on this project.

Very truly yours,

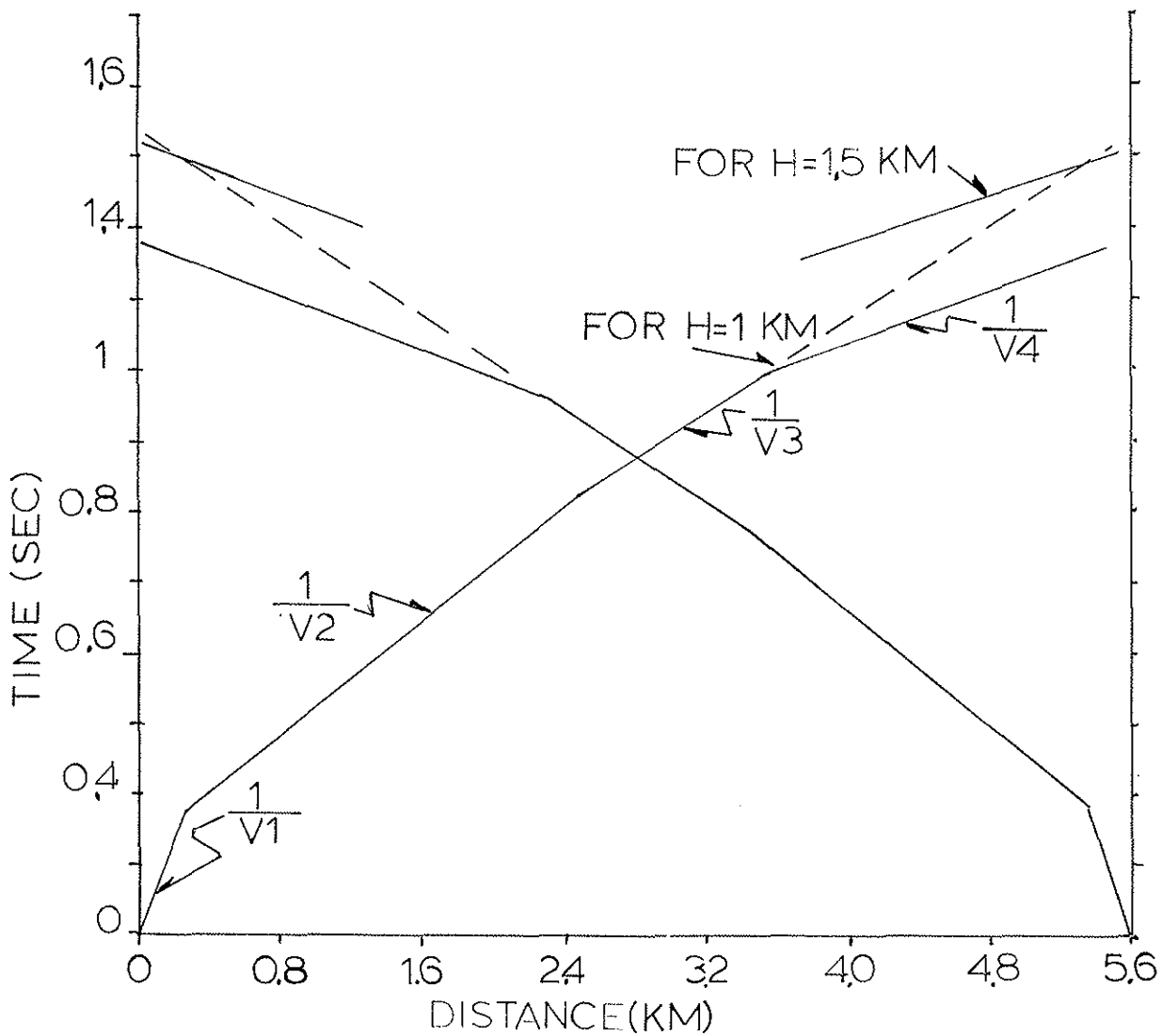
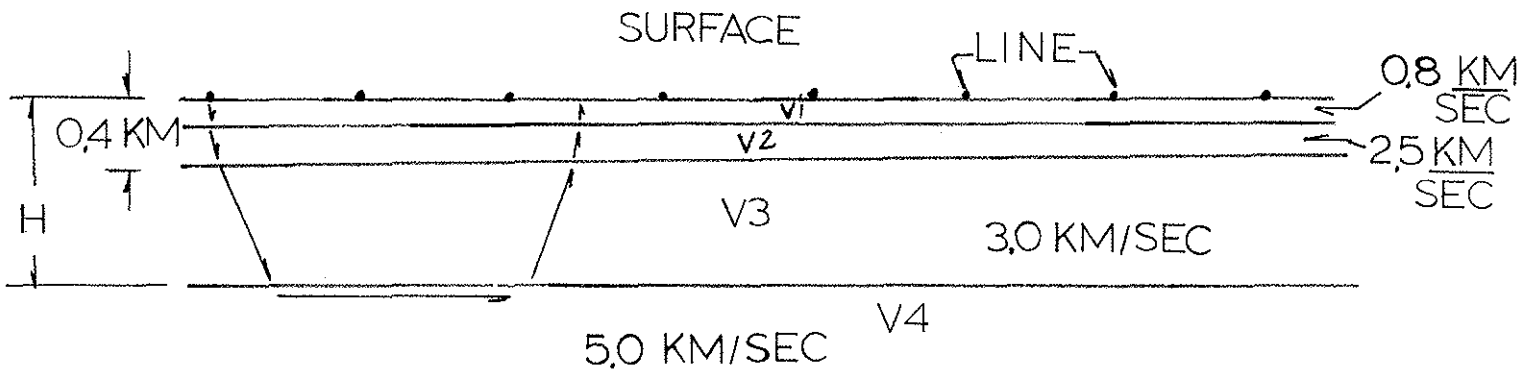


Paul Larry Brown

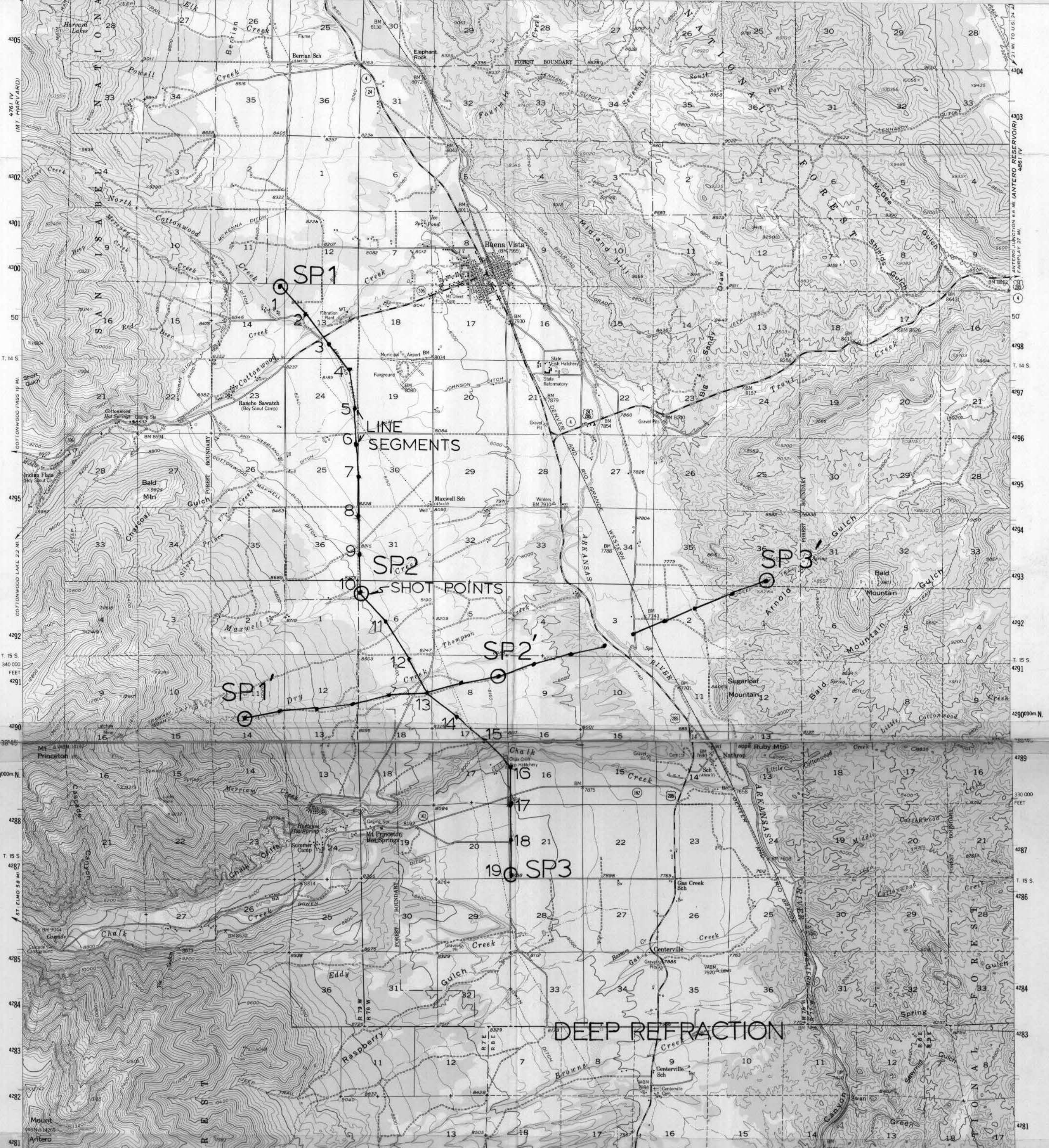
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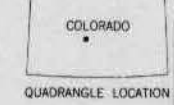
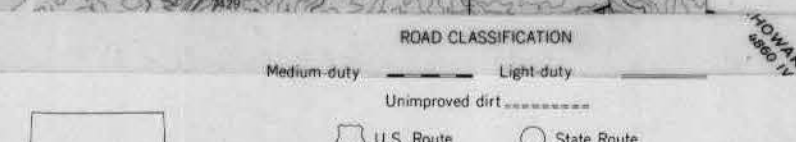
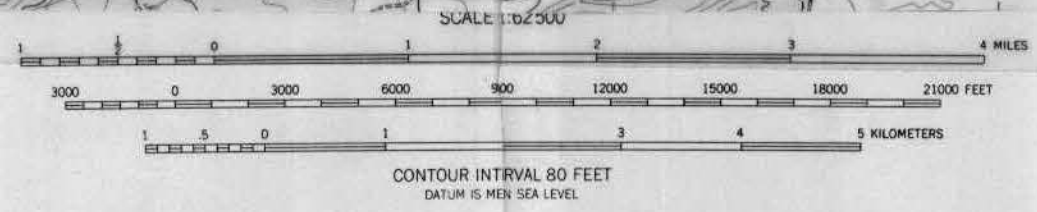
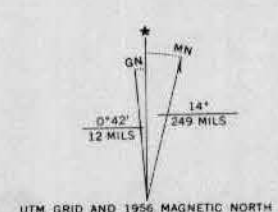
# MODEL FIGURE 1



TIME-DISTANCE FIGURE 2



Mapped, edited, and published by the Geological Survey  
 Control by USGS and USC&GS  
 Topography from aerial photographs by photogrammetric methods  
 Aerial photographs taken 1953. Field check 1956  
 Polyconic projection. 1927 North American datum  
 10,000-foot grid based on Colorado coordinate system,  
 central zone  
 1000-meter Universal Transverse Mercator grid ticks,  
 zone 13, shown in blue  
 Red tint indicates areas in which only  
 landmark buildings are shown  
 Dashed land lines indicate approximate locations  
 Certain land lines are omitted in T. 50 and 51 N., R. 7 E.  
 and T. 15 S., R. 79 W. because of insufficient data  
 T. 49, 50, and 51 N., R. 6, 7, 8 and 9 E. are based  
 on the New Mexico Principal Meridian  
 T. 15 S., R. 77, 78 and 79 W. are based  
 on the Sixth Principal Meridian



# PLATE 1

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
 FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER COLORADO 80225 OR WASHINGTON, D. C. 20242  
 A FOLDER DESCRIBING TOPOGRAPHIC MAP AND SYMBOLS IS AVAILABLE ON REQUEST

PONCHA SPRINGS COLO.  
 Mt. Princeton Prospect  
 AND 4761 II-SERIES 4775