# REGIONAL GEOPHYSICAL INVESTIGATIONS OF THE LISBON VALLEY AREA UTAH AND COLORADO

By P. Edward Byerly and H. R. Joesting

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Trace Elements Investigations Report 677

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

August 29, 1958

AEC-71/9

Mr. Robert D. Nininger
Assistant Director for Exploration
Division of Raw Materials
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Bob:

Transmitted herewith are three copies of TEI-677, "Regional geophysical investigations of the Lisbon Valley area, Utah and Colorado," by P. Edward Byerly and H. R. Joesting, July 1958.

This report is an abstract of a paper with the same title that is planned for publication as a Geological Survey professional paper. A copy of the entire report is in the TEPCO files.

Sincerely yours,

John H. Eric

for W. H. Bradley
Chief Geologist

Geology and Mineralogy

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

# REGIONAL GEOPHYSICAL INVESTIGATIONS OF THE LISBON VALLEY AREA, UTAH AND COLORADO*

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*This report concerns work done partly on behalf of the Division of Raw Materials of the U. S. Atomic Energy Commission.

USGS - TEI-677

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# REGIONAL GEOPHYSICAL INVESTIGATIONS OF THE LISBON VALLEY AREA, UTAH AND COLORADO

By P. Edward Byerly and H. R. Joesting

## ABSTRACT

Aeromagnetic and gravity surveys have been conducted in the Lisbon Valley area as part of a study of the regional geology of the Colorado Plateau. The Lisbon Valley area is located in the Paradox Basin in the east-central part of the Colorado Plateau. As defined here it includes the southern three quarters of the Mt. Peale, Utah and Colorado, 30-minute quadrangle.

Exposed rocks range in age from Pennsylvanian to Quaternary, and include, in the northern part of the area, the intrusive rocks of the La Sal Mountains of probable Tertiary age. The Pennsylvanian section includes limestones and clastic rocks, whereas the overlying Permian and younger sedimentary rocks are mainly sandstone, siltstone, and shale. Evaporites of Pennsylvanian age have been penetrated in a well in the Lisbon Valley area. Older rocks of Pennsylvanian, Mississippian, Devonian, and Cambrian (?) age have been penetrated in wells drilled in adjoining areas, and probably are present in the Lisbon Valley area.

The major structure is the Lisbon Valley faulted salt anticline, with its accompanying negative gravity anomaly of about -15 milligals. This structure differs from most of the other large salt anticlines of the Paradox Basin, in that the evaporites do not intrude the overlying rocks. A piercement salt plug, north of the Lisbon Valley anticline, and local thickening of salt in the west and northwest parts of the area are

also indicated by gravity anomalies. The alignment of late Paleozoic salt intrusions with the South Mountain group of igneous intrusions in the La Sal Mountains indicates that this group was intruded along a zone of previous structural activity.

The magnetic anomalies are caused mainly by variations in the magnetization of the basement rocks. Basement structural trends, as indicated by magnetic trends, coincide in part with surface structure and are divergent in part. A prominent basement ridge or platform in the southwest part of the area, flanked by a basin to the northeast, is indicated by the magnetic data.