

UNITED STATES DEPARTMENT OF THE INTERIOR
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A POTENTIAL TARGET FOR POTASH SOLUTION MINING IN CYCLE 18, PARADOX
MEMBER OF THE HERMOSA FORMATION, SAN JUAN COUNTY, UTAH,
AND DOLORES AND MONTEZUMA COUNTIES, COLORADO

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A deep and extensive deposit of potash, which may have significant potential for solution mining, underlies an area of about 1,295 km² in the Paradox basin of southwest Colorado and southeast Utah. The deposit, which straddles the Utah-Colorado border, is centered about 30 km southeast of Monticello, Utah.

The deposit is in evaporite cycle 18 of the Middle Pennsylvanian Paradox Member of the Hermosa Formation, and this evaporite cycle contains potash elsewhere in the Paradox basin. It is in the area covered by this report, however, that the deposit reaches its greatest thickness and K₂O content.

The halite unit of cycle 18 is one of the thickest halite beds in the Paradox Member. Maximum known thickness of halite in cycle 18 in the report area is about 100 m. An isopach map of cycle 18 halite (fig. 1) shows a rough correlation between maximum halite thickness and maximum concentration of potash.

The potash in cycle 18 generally consists of two deposits which are separated by as much as 10 m of barren halite (fig. 2). The uppermost deposit generally contains the greatest concentration of potash. The maximum known thickness of the upper deposit in the report area is about 9 m. The potash in the report area has not been cored; however, geophysical logs indicate that it consists of sylvite (KCl). Furthermore, logs from several wells penetrating the deposit suggest a concentration of >30 percent K₂O. Neutron logs of drill holes penetrating the deposit indicate the

possible presence of several thin beds of insoluble material in the potash sequence. Although such material might generally be viewed as deleterious, in this case it may enhance the possible development of the deposit by solution mining. These thin insoluble layers, which probably consist of dolomite, black shale, and anhydrite, may impart horizontal planes of structural weakness through the potash deposit. These planes of weakness might facilitate artificial fracturing of the potash deposit which is one step commonly used in solution mining.

Depths to the potash deposit average about 2,100 m; these depths put the deposit well out of the reach of conventional shaft mining but within what is considered to be a favorable depth for solution mining. Throughout the report area the potash deposit is essentially flat lying.

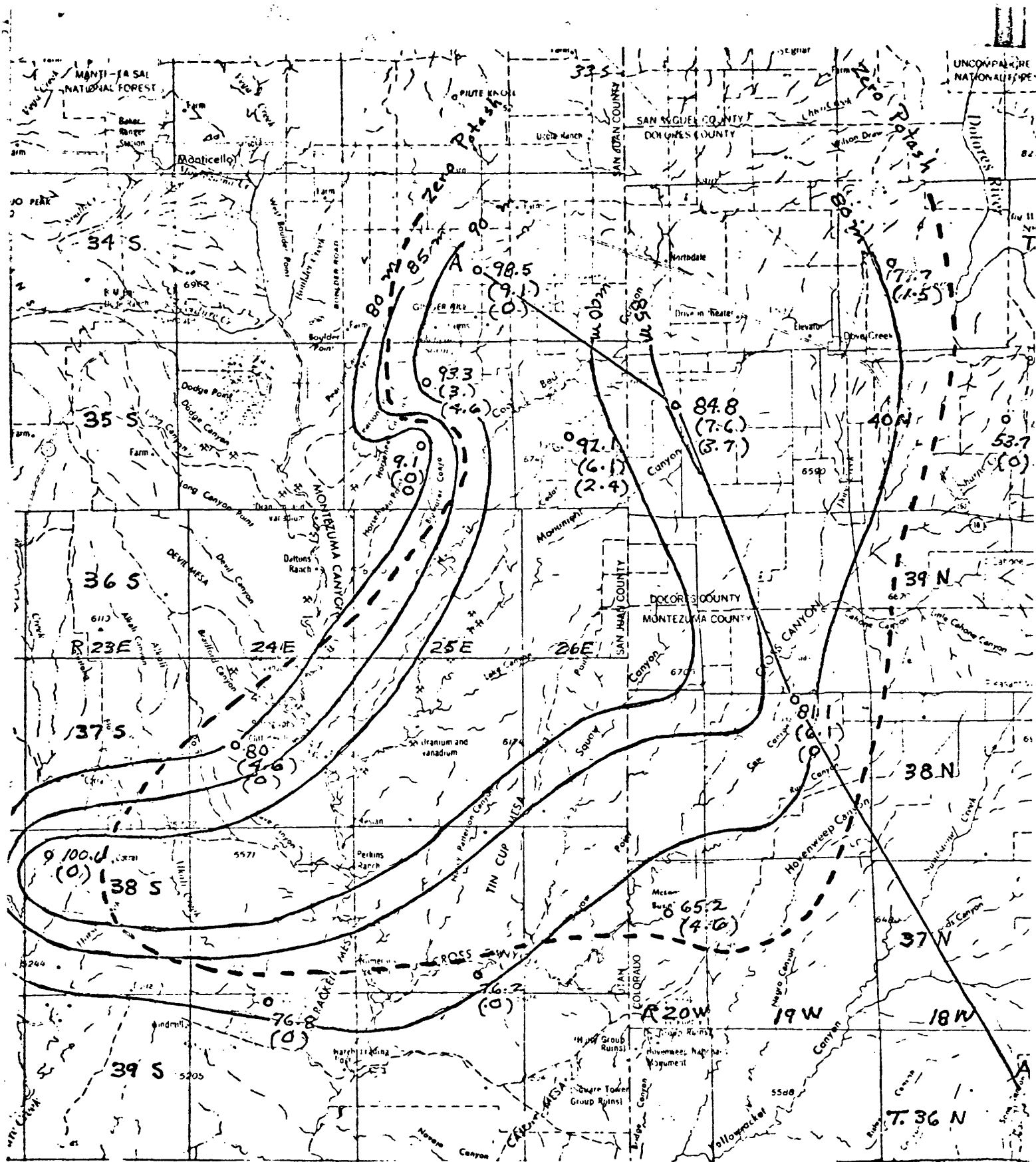


Figure 1.--Index and isopach map (halite thickness in meters) showing drill holes penetrating evaporite cycle 18 of the Paradox Member and line of section (A - A') for figure 2. Dashed line represents approximate limits of potash. Upper number adjacent to drill hole indicates halite thickness. Numbers in parentheses indicate thicknesses of upper and lower potash deposits.