

Structure and Physical Stratigraphy of the B Unit of the Vernon Formation, Dale and Wyoming Brine Fields, Wyoming County, New York

by

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ABSTRACT

Solution mining in the Salina Group has been in progress in the Dale and Wyoming brine fields since 1970. In northern Wyoming County, New York, bedded salt deposits are found only in the B unit of the Vernon Formation. Additional salt beds are present at higher stratigraphic levels to the south and east. The stratigraphic section dips gently and increases in thickness south-southeastward toward the Appalachian basin.

The main branch of the Clarendon-Linden fault is adjacent to the western margin of the Dale brine field. Below the salt, this structure is known to be a north-south trending high angle reverse fault that is upthrown on the east, but there is some evidence that it transforms from a fault to a flexure as it continues upward through the Salina Group. Some seismicity was induced along the fault during hydraulic fracturing operations in the first year of solution mining, but modification of procedures has resulted in no further occurrences of this phenomenon.

High resolution isopach and structure contour maps provide a clear view of the structural framework of both brine fields. Structure contours drawn on the top of the Vernon A give no indication of faulting in either brine field. The Vernon B thins abruptly by 10-15 feet within 500 feet of the Clarendon-Linden fault. Other small variations in thickness of the Vernon B in both brine fields show no spatial correlation to either present day topography or structural trends in the Appalachian basin which are present within a few miles to the south.

Localized, small scale deformation of thin shale interbeds within the Vernon B has occurred along narrow curvilinear trends, up to 1500 feet in length, in both brine fields. Like the small variations in thickness, these trends exhibit no spatial correlation with either present day topography or structural trends in the Appalachian basin, and they are attributed to flow of the salt during compaction. Other very small scale flexures and faults are known to occur near the surface. These structures have been attributed to relief of stresses caused by development of present topography, or to local stress concentrations. None have been recognized in either brine field.