

MEMORANDUM

DATE: November 4, 2016
TO: Steve Army, Christopher Lucidi,
FROM: Dave Plumeau
RE: Summary of Results of "Large Pillar" mine design in U-74

The Cayuga Mine determined that a "large pillar" mine design would be more appropriate under certain regions of its mineral reserves. Those regions may have areas of weak overburden strata.

Unit 74 (U-74) had advanced far enough toward one of those regions that it was stopped and converted to a large pillar mine design. This design provides better support for the overburden and creates lower stress changes within the strata above the mine.

Rock behavior studies were conducted using analysis of the mine's data, results from the Whiskey Island Mine that Cargill operates in Cleveland, Ohio, and theoretical mine closure calculations. Computer modeling of the new design was conducted and, along with the other studies, showed that the design would be stable.

With the review of the DEC and its consultant, Cargill began mining a limited distance in order to establish ventilation methods and equipment and to monitor roof and pillar behavior for possible local instability. Mining has advanced about 160' feet into the new design as shown on the attached mine map.

To date the mine roof in the large pillar area is behaving excellently. Mining is very slow due to ventilation issues after blasting has occurred, but more ventilation equipment is being installed to help improve the situation.

Cargill will continue to provide progress reports to the DEC as mining advances.

Dave...