

Cayuga Salt Mine

2014 Annual Report and Review Points of Interest

Review (From John Boyd Co. to DEC):

- Filed March 18th, 2015

Stratigraphy

- Accepted, but “additional information is required for further evaluation.” This includes a **map** of “thin rock overburden” (**Frontenac Point Anomaly**), a 1000 ft setback from this anomaly and “mine projections.” Also, requesting **well data and seismic data** to better characterize presence of brine in and around the Salina salts. No distinction drawn here between native (formation) brine and anthropogenically-emplaced brine.
- Requests for items in next year’s report (2015) include assessment of salt dissolution/pillar stability issues on **Level 4**.
- Based on RESPEC report (citation below), seismic survey indicates thin rock overburden may overlap with the Frontenac Point anomaly (no definition of anomaly given)

⁷ DeVries, Kerry L., William M. Goodman, and Cody A. Vining, 2014, “Mine Stability Assessment, Cargill Deicing Technology, Cayuga Mine, Lansing, New York,” RESPEC Topical Report RSI-2371, prepared for Cargill Deicing Technology, April.

- Consultant “Mr. Petersen” apparently hired by Cargill recommends elimination of panel breakthroughs in case of flooding, and **no intersecting panels near the Northern Anomaly** to avoid “higher closure and problems.” Possibly referring to Frontenac Point anomaly.
- JM: No indication as to the current status of flooding risk. Do we have access to Petersen’s report?

Subsidence

- Requests for a “**prudent subsidence monitoring plan**” in the subsequent report (survey, survey frequency, monument installation, data assessment) may imply that there was not one in place at this time. At least, it implies the data was not shared with the contractor/DEC.

- Cargill has **promised a subsidence survey in each annual report 2012-2014**. For the east shore of Cayuga Lake. If these surveys ever happened, they were not part of the annual reports, as they apparently should have been.

Water

- **Rate of water storage** is currently reported at 16.8 MMGal/yr, however extrapolating their reported inflow rates (given in gpm) returns an inflow value of ~23 MMGal/yr. Does this call into question the accuracy of their inflow data? (See "Parameters of Interest" spreadsheet).
- JM: Is there any stored water chemistry data available? Given issues with pillar stability near injection site, you'd assume they'd keep an eye on the chemical profile of the water their storing in the Level 4 ponds. This can result in **mine collapse** and is referenced as the top inspection priority for a TBD site visit.

Room Closure

- Unexpected room closure at U12 and U40B.
- Overall, **41% of closure monitoring** stations had their highest closure measurement of the year on the final reading of the year. Reviewer attributes this to humidity in the late summer-fall.
- Closure in **active** mining areas is not perceived as an issue by the reviewer (panels U62 and U68 had highest closure of active areas). In the **inactive** mined regions, anomalous backfilled panels U40 and U12 have closure rates **~1 in/year**. One convergence station in U40B **could not be located**.
- RESPEC expects total closure of 4 ft. in U40B
- U12's backfill **not sufficiently preventing room closure** at this time

Miscellaneous

- **Velocity logs** completed on Corehole 18 by ESG Canada Inc.