2023 ANNUAL REPORT REVIEW
CAYUGA MINE, CARGILL, INC.

Seneca and Tompkins Counties, New York

Prepared For

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

By

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Report No. 2499.008
MAY 2024

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May 14, 2024
File: 2499.008

New York State Department of Environmental Conservation
Bureau of Resource Management & Development
Division of Mineral Resources
625 Broadway, Third Floor
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Attention: Mr. Matthew Podniesinski
Chief, Resource Development Section
Bureau of Resource
Management & Development

Subject: 2023 Annual Report Review
Cayuga Mine, Cargill, Inc.
Seneca and Tompkins Counties, New York

Ladies and Gentlemen:

At the request of the New York State Department of Environmental Conservation (NYSDEC), Dr. Keith A. Heasley, Executive Consultant – Geotechnical, of John T. Boyd Company (BOYD) reviewed the Annual Report for the Cayuga Mine signed by Shawn G. Wilczynski. The signed report[1] file, was received by Matthew Podniesinski, New York State Department of Environmental Conservation via email on February 15, 2024. Supporting data were received by BOYD in March and April 2024 via a secured shared internet drive.

On February 15, 2006, Mr. Steven M. Potter, then the Director, Bureau of Resource Management & Development, NYSDEC, requested that BOYD review all documents, digital data, and annual reports received by BOYD starting with the 2006 Annual Report.

[1] Wilczynski, Shawn G.,2024, Annual Report for Mine File #709-3-29-0052; Cayuga Salt Mine, Permit ID#0-9999-00075-00001, Towns of Lansing and Ulysses, County of Tompkins, Town of Covert, County of Seneca, File: Cargill DEC annual report for Jan - Dec 2023.docx, Cargill Salt letter to Matthew Podniesinski, New York State Department of Environmental Conservation, February 23.

The received documents were reviewed for their adherence to conditions of the revised Permit[2]. Condition 16 of the permit notes, “Consultant Services - Cargill is responsible for retaining and funding Consultant Services to be provided by a qualified, independent mining engineering geotechnical consultant.” BOYD is providing the Consulting Services for this annual review.

Discussion of Annual Report

The Permit has several conditions that affect the Annual Report and its review including:

Condition 9

Condition 9 of the Permit notes, “Frontenac Point Anomaly - No mining shall occur under the Frontenac Point Anomaly. No mining or mining activities shall be conducted within 1000 feet of the Frontenac Point Anomaly.”

Condition 10

Condition 10 of the Permit notes, “Further Investigations - Cargill shall conduct further investigations and report on the adequacy of the thin rock overburden at the northern extent of the mineral lease area where the solid rock overburden becomes thinner where the glacial till and lake sediments thicken and lake depth increases. Additionally, further investigation and reporting shall be conducted for areas identified as anomalies A and B (and any other anomalous areas identified through additional investigations) if Cargill proposes to mine under these areas, or up to these areas without an established standoff. The aforementioned conditions must be thoroughly analyzed for stability by Cargill and reviewed by the Department before mining proceeds in these areas.”

Past and current discussion points regarding Condition 10 follow:

- Based upon the additional seismic survey and consultant reports, Cargill will maintain the planned 1,000 ft setback around the Frontenac Point Anomaly. Further investigation is to be completed and submitted to the Department for review and approval prior to mining within this 1,000 ft buffer.
- The required additional investigations and reports have been performed for Anomaly C. Further, undermining of Anomaly C was completed from June, 2018 through July 2019 using a large pillar configuration rather than the more yielding production pillar

[2] New York State Department of Environmental Conservation, 2021, Permit, Under the Environmental Conservation Law,” permit Issued to: Cargill Incorporated, for facility: Cayuga Salt Mine, DEC ID 0-9999-00075, effective date with modifications February 12, 2021, expiration date April 23, 2024, Permit Administrator Elizabeth A. Tracy, February 12.

previously used at the Cayuga Mine[3]. The undermining of the C Anomaly "did not present any indications of geologic or geotechnical concerns associated with potential scouring of overlying rock mass," and the C Anomaly exploration borehole "has shown no evidence of water or gas or dissolution since it was completed in 2017."

- Cargill has agreed that no additional mining will occur under Anomaly E and no mining will occur under Anomaly D and the Frontenac Point Anomaly. Additional investigations and reports will need to be undertaken for Anomalies A and B, and mining in these areas should be avoided until reviewed and approved by the NYSDEC.
- in 2023, a report was prepared[4] and presented[5] on the reprocessing and associated reinterpretation of the seismic data from 14 historic, 2-D seismic lines above the Cayuga Mine. After reviewing the seismic reprocessing and reinterpretation, BOYD agreed[6]: "(1) with Cargill's acceptance of the 4C Exploration, Ltd reprocessing and reinterpretation of the historic seismic data as the most extensive, accurate (and realistic) representation of the Cayuga Lake-bottom glacial scours, (2) that the Onondaga carbonate beam is only slightly scoured (less than 20 ft) and retains a substantial thickness (more than 400 ft) for mining to occur 1,000 ft below, and (3) that Cargill has provided sufficient affirmative "further investigation" to comply with Permit Special Conditions 10 (formerly 9B) and that mining can proceed under the B and A scours."

Condition 17.a.

Condition 17.a. requires "For each year the mine is in operation, Cargill shall submit to the Department an Annual Report. The report shall be due on or before each anniversary date of the issuance of the permit."

<u>Condition 17.a.(1)</u>

Condition 17.a.(1) requires "Certification signed by the Cargill Lansing Mine Manager that all mining related activities, to the best of his knowledge, conducted during the reporting year were in conformance with this permit and the approved plans, or that variances have been reported and managed."

- A certification was included on page 2 and the certification was signed by Mr. Shawn G. Wilczynski, Mine Manager, on February 15, 2024. This certification notes "that all

[3] Scopa, Zoe, 2023, Cayuga Mine – Further Investigation of Reserves under A and B Scour Zones. Memorandum to Keith Heasley, John T. Boyd Company, August 25.

[4] 4C Exploration Ltd, 2023b, 2D Seismic Depth Imaging Results Lansing Salt Mine, Cayuga County, NY, March 2023.

[5] 4C Exploration Ltd, 2023a, The Use of Depth Migration to Improve Seismic Imaging at Lansing Salt Mine, Cayuga County, NY, PowerPoint presentation, Cargill Salt, July 11.

[6] BOYD, 2023, Seismic Reprocessing of Anomalies A and B Cayuga Mine, Cargill, Inc., October 20.

mining activities, to the best of my knowledge, conducted during the reporting period from January 1st of 2023 through December 31st of 2023 were in conformance with the DEC Permit # 0-9999-00075/00001 and the approved plans. No variances occurred and none were reported."

Condition 17.a.(2)

Condition 17.a.(2) requires "A summary of non-routine mining incidents as defined in Special Condition 19 of this permit and any action taken by Cargill in response thereto or resolution thereof." And Special Condition 19 states regarding Non-Routine Incidents - "Cargill shall immediately notify the Department's Region 7 Mined Land Reclamation Specialist of any non-routine mining incidents both surface and subsurface associated with activities related to this permit. Non-routine mining incidents shall mean incidents during mining, processing, or other mine related activities that may adversely affect mine stability, ground and surface water and other natural resources, or the health, safety, welfare or property of the general public. The Department shall require Cargill to record any data the Department believes may be of future value for adequate evaluation of a non-routine mining incident."

On Page 2 of the Annual Report, it is noted "The Cayuga Mine is not aware of any non-routine incidents associated with the mining, processing, or other mine related activities that would have adversely affected any of the following:

- Mine stability
- Ground and surface water
- Natural resources
- Health, safety, welfare or property of the general public."

Condition 17.a.(3)

Condition 17.a.(3) requires: "An updated Mining Plan Map depicting the current extent of mining activities, and the proposed advancement of the working faces for the subsequent three years."

Included with the Annual Report data was a map[7] depicting the recent northern workings of the Cargill mine, the planned mining for the next three fiscal years, the shorelines of Cayuga Lake, and the Frontenac Point, A and B anomalies.

The Annual Report notes "The Cayuga Mine is currently operating in the northern region of the mine. Active mining is located in panels U-78, U-84, U-86, and U-88."

[7] Cargill, Inc., 2023, Cayuga Mine, 3 Yr Mine Plan, 3yr Mine Plan Cayuga.pdf, February 15.

The following maps were included in the data available to BOYD and support this report:

- “Basemap.dwg”, Last modified 03/26/24, contains the latest pillar plan for the mine.
- “Cayuga 5-yr Mine Plan.dwg”, Last Modified 02/15/24, Contains the broad areas that are to be mined in 2024-2028. Also shows the location of anomalies A and B.
- “Cayuga Royalty Map.dwg”, Last Modified 02/15/24, Contains the monthly face advances from 1987 through 2019.
- “ESCAPEWAY MAP DEC 2023.DWG”, Last modified 03/27/24, contains the routes of the primary and secondary escapeways along with the primary ventilation routes and controls.
- “Royalties 2019-2023.dwg”, Last Modified 04/01/24, Contains the monthly face advances for 2019 through 2023, following those in “Cayuga Royalty Map.dwg”.
- “yieldpoint stations and mst network 2023.dwg”, Last Modified 02/16/24, Contains the convergence and extensometer station locations and the last quarterly convergence reading.

Condition 17.a.(4)

Condition 17.a.(4) requires “The summary of in situ measurements of rock mechanics required by Special Condition 18.b. of this permit.” Special Condition 18.b. states: “In situ measurements of rock mechanics shall be collected in accordance with the approved Mined Land Use Plan. A summary of the data collected shall be submitted to the Department as part of the Annual Report. Exceptions to anticipated trends in rock behavior shad be noted and explained to the Department after these data are collected and exceptions to the anticipated behavior are identified. If closure rates are higher than anticipated, Cargill shall increase the frequency of measurement in the affected area and submit for review and approved by the Department a plan and implementation schedule for corrective action.”

Closure Measurements

On Page 2 of the Annual Report Cargill noted “Currently, there are over 300 convergence stations being monitored.” And “Evaluations of the convergence data indicate that overall no unusual trends have been identified and the mine is behaving as expected.”

Cargill provided closure data, including raw and processed data, graphs, and, on occasion, explanations of any inconsistencies and anomalous readings including reasons for abandonment, along with observation in the vicinity of the instrument, in

Excel spreadsheets. The location of closure stations and extensometers were shown on the following maps:

- “yieldpoint stations and mst network 2023.dwg”, Last Modified 02/16/24, Contains the convergence and extensometer station locations.
- “Convergence Map 2023-6level-Model.pdf” containing the map; Cargill Deicing Technology, Cayuga Mine, 6 Level Workings.

Closure measurements can be evaluated to indicate possible instability in three ways:

1. By studying the graphs of the rate of closure over time. The shape of these graphs indicates areas of instability, areas of concern, and areas of stability. Mr. Petersen of Rocktec Solutions (Cargill geotechnical consultant) has evaluated the closure in this manner in the past.
2. By establishing trigger values for total closure. This method is applicable in harder, less viscous rock, but is not applicable for the Cayuga Mine, as stable closure in salt will continue until the openings are closed.
3. By establishing trigger values for long-term closure rates. Since this is not being completed by the other investigators, BOYD applied such trigger rates in its evaluation of the closure readings.

All of the 350+ convergence stations (both manual and the electronically-read yieldpoint system) that were monitored within the last few years were scrutinized for total convergence, convergence rate, and trends; and the 20 stations with the highest convergence rates for the most recent reading are listed in Table 1. After analyzing the location, time since installation, total measured closure, closure rate and closure trends, BOYD determined that the closure stations listed in Table 1 could be divided into four groups with similar characteristics and explanations.

Table 1: Stations with the highest closure rates

Station	Closure Rate (in./year)	Time Since Installation (days)	Total Measured Closure (in)	Group	Notes
W1 - #4	0.674	14,630	24.087	4	drumy floor, floor heave
U40B - #14	0.587	8,224	31.234	2	
U40B - #8E	0.581	8,364		2	
U86 - #2	0.567	325	1.139	1	
U88 - #1	0.549	1,700	3.057	1	Started mining in 2022
U12 - #108E	0.531			3	
NW3 - #56	0.514	1,461	8.175	1	
U12 - #107	0.501	8,189	13.131	3	
U12 - #32	0.501	12,687	26.746	3	
U12 - #28E	0.496	12,460		3	
U40B - #2	0.449	8,475	24.763	2	
NW3 - #62	0.447	1,246	9.068	1	
U44 - #2	0.447	7,895	21.518	2	
NW3 - #68	0.430	1,081	7.545	1	
U63 - #32	0.428	2,331	8.241	4	humidity?, increase reading freq.
NW2 - #56	0.417	6,406	17.169	4	
U36 - #8	0.404	8,373	16.810	4	reset rod
NW3 - #50	0.394	2,064	8.110	1	
U12 - #92	0.391	1,632	0.968	3	
U12 - #106E	0.382			3	

Note: the stations numbers followed by the “E” were read electronically by the yieldpoint system

1. Group 1 are the convergence stations that are located near the recent active mining which has occurred in panels U78, U80, U82, U84, U86, and U88. This group of stations are located in the outby end of the sections or in the Northwest 3 (NW3) mains from which the active sections were driven. The areas surrounding all of these convergence stations were recently mined and are still undergoing the relatively quick initial closure after initial mining. Further, all of these stations are still being affected by additional yielding and stresses from the nearby active sections. Since the locations of these convergence stations were somewhat recently mined, the total measured closures are small (1 to 9 in.), and since active mining has moved more distant, the closure rates are all decreasing.

2. The Group 2 convergence stations are all located in or around panel U40B. It appears that panel U40B was originally driven as a yield-pillar production panel around 400-500 ft wide. Then, non-typically, other 400-500 ft wide yield-pillar production panels (U42, U44E, and U46E) were driven directly from U40B. This is in contrast to a sub-main such as E1, NW1, NW2, and NW3, that are typically 270-350 ft wide from which the typical 400-500 ft wide yield-pillar production panel have traditionally been driven. This development scenario has caused a number of

relatively wide yield-pillar extraction areas where the production panels intersect along U40B, and these wide panel intersections are monitored by convergence stations U40B#2, U40B#8, and U40B#14, all of which show significant total closure (21 to 31 in.) and relatively high closure rates. However, the closure rates for the U40B stations have been fairly steady and generally decreasing for the last 20 years and are consistent with a stable viscous closure of the area as would be expected.

3. The Group 3 convergence stations are all located in a zone of concentrated high closure rate in panel U12, that has experienced anomalous mine closure rates since 2018. The U12 panel was originally driven in 1998 and it is slightly wider (475 to 575 ft) than most of the more recent (400-500 ft wide) yield-pillar panels. Because of their age and elevated closure rate, all of the Group 3 convergence stations have significant total closure (13 – 26 in.) and relatively high closure rates. However, similar to panel U40B, the closure rates for the U12 stations have been fairly steady and generally decreasing (with a noted seasonal variation) for the last 20 years and are consistent with a stable viscous closure of the area as would be expected for a salt mine.

4. The Group 4 convergence stations are four random stations with somewhat elevated convergence readings. Station W1 - #4 is located in the original bottom area of the mine and was installed 40 years ago. It does have a relatively high rate of closure 0.67-0.70 in./year and has closed a considerable amount (24.09 in.) since the original installation. However, the closure rate has been fairly constant for the last 37 years and the entry appears to be in a stable closure mode as would be expected for a viscous salt mine entry. It is also noted in the files as having potential floor heave which may have increased the observed closure rate. Closure stations U63 - #32, NW2 - #56 and U36 - #8 are spread throughout the mine, and the station location and local geometry do not necessarily suggest a higher closure rate. Studying the graphs of closure and closure rate for these three stations shows a steady trend of generally decreasing closure rate, (with some variation) for many years, but the most recent closure reading shows a slightly anomalous increase for the last few months, which ranks these stations in the top 20 closure rates. This slightly higher closure rate is not alarming, but should be studied to be verified as natural variation with succeeding closure rate measurements.

Closure rate data are significant because they offer insight into the collapses and the inundation of the Retsof Mine. Sustained closure rates of 15 in./year or less were measured in stable areas of the Retsof Mine, while in the failure areas, closure was regularly measured with sustained rates over 230 in./year with onset of failure around 600 in./year. Although Retsof and Cayuga mines have different overburden and material properties, in the general sense, a comparison seems warranted for a relative indicator of stability. In comparison, the highest closure rate reported in this annual report was 0.674 in./year for the closure station W1 - #4. This rate is 4.5% of the Retsof Mine stable area sustained rate, 0.3% of Retsof Mine’s strained rate, and 0.1% for Retsof Mine’s onset of failure rate.

Extensometer Measurements

Cargill, in addressing their extensometer program, included a statement in the Annual Report on page 2, Section 17.a.(4) that “Roof sag and wall expansion, measured with extensometers, is also monitored as conditions warrant, and is reviewed internally and externally as well. This data indicates the mine is behaving as expected.”

BOYD was provided with data from 31 extensometers, all of them were multiple-point extensometers, and 25 of them were electronically read on the YieldPoint system. With the YieldPoint system (all 3-point extensometers), only the dilation rate for the total gage length was reported (by only analyzing the total gage length, higher strain rates at the shorter gage lengths near the mine roof may be missed.) The location of the extensometers can be divided into 6 areas: the Pamel Pass in 4-Level, the Surge Bin in 4-level, the belt area near the bottom of No. 1 Slope, the belt area near the bottom of No. 2 Slope, the neck of Panel U12, and the shop in U81.

- There are 4 triple-point extensometers with heights ranging from 9-11.5 ft located along a 400 ft section of entry (Pamel Pass) in the 4-Level at the top of the No. 2 slope from the 6-Level. These four extensometers are manually read and have shown very slow steady dilation/movement since being installed in 2009. The largest dilations are in the first 3 to 4 ft of the roof with the greatest total dilation during the last year in extensometers #4 of 1.195 in. and a rate of 0.107 in./yr (a strain rate of 2.2×10^{-3} -/yr).

- The Surge Bin area of 4-level has 2 manually-read, triple-point extensometers (up to a height of 19’ 4”) and 11 electronically-read extensometers on the YieldPoint system. The largest dilation reading reported in this area was in the first 6 ft of the roof at extensometer #50 (in 2022) with a total dilation of 1.846 in. and an average dilation rate of 0.111 in./yr (a strain rate of 1.5×10^{-3} -/yr).

- In the belt entry near the bottom of the No. 1 Slope, there are 3 triple-point extensometers with anchors at 5, 10 and 15 ft that are electronically read by the YieldPoint system. The largest dilation reading in this area for the year was at extensometer #2 with a peak dilation rate of 0.183 in./yr (a strain rate of 1.0×10^{-3} -/yr).

- In the belt entry near the bottom of the No. 2 Slope, there are 7 triple-point extensometers with anchors at 5, 10, and 15 ft that are electronically read by the YieldPoint system. The largest dilation reading in this area for the year was at extensometer #1 (in the center of the intersection) with a peak dilation rate of 0.1156 in./yr (a strain rate of 0.8×10^{-3} -/yr).

- There is one extensometer in the center of intersection A-7 in Panel U12. This extensometer shows a very low dilation rate of 0.0083 in./yr (a strain rate of 0.076×10^{-3} -/yr)

- In the shop area in panel U81 near the active panels, there are 3 triple-point extensometers with anchors at 5, 10, and 15 ft that are electronically read by the YieldPoint system. The largest dilation reading in this area for the year was in the first 5 ft of the roof at extensometer #3 with a peak dilation rate of 0.0518 in./yr (a strain rate of 0.9 x 10^{-3} -/yr).

Like previous reviews, BOYD evaluated the rate measured as strain per year. Using RESPEC's 1995 Cargill salts values:

Dilation Limit	$J_2^{0.5}/I_1 = 0.36$
Creep Rate	$\dot{\varepsilon}^c = 8.3 \times 10^{-30}(\Delta\sigma)^{5.9}$

BOYD assessed the stress state to estimate that a strain rate greater than 8 ×10^{-3} (-/yr) is needed for destructive dilation. The highest calculated strain rate from the 31 extensometers reported by Cargill was 2.2 x 10^{-3} -/yr which is well below the limit of destructive dilation.

Micro-seismic Measurements
The 2023 Annual Report Data included seismic reports by ESG Solutions.

The annual report, on pages two and three, also addresses Cayuga Mine's micro-seismic network, noting that the network "… now has over 120 geophones and covers over 6 square miles of mine workings." And "This data indicates the mine is behaving as expected and global stability continues to be maintained."

Cargill notes in the annual report that "The Cayuga Mine operates a micro-seismic monitoring network which now has over 120 geophones and covers over 6 square miles of mine workings. Microseismic monitoring is continuous and the data from this system is reviewed internally by the engineering department and externally by Engineering Seismology Group (ESG) and RESPEC. This data indicates the mine is behaving as expected and global stability continues to be maintained." ESG Solutions prepared 12 monthly reports for 2023 titled, "Seismic Data Processing Results and Health Analysis Report for Cayuga Monitoring System."

<u>Condition 17.a.(5)</u>
Condition 17.a.(5) requires "The summary of subsidence monitoring data required by Special Condition 18.a. of this permit." Special Condition 18.a. states "Subsidence monitoring shall be conducted in accordance with the approved subsidence monitoring plan contained in the approved Mined Land Use Plan. Summaries of data collected shall be submitted to the Department as part of the Annual Report. Exceptions to anticipated

trends shall be noted and explained to the Department after the data are collected and exceptions to anticipated behavior are established."

On June 16, 2022, discussions at a meeting among Cargill, BOYD, and the NYDEC, addressed the LiDAR reporting. LiDAR represents an advance over land surveys as the LiDAR extensive coverage is over an area as opposed to just at limited points along established survey lines. The data points tend to be at a greater density. Such an advance in subsidence monitoring was embraced by the meeting attendees who agreed on the following suggested changes to Condition 17.a.(5):

- A LiDAR survey will be completed every two years of mine affected land, including land survey of control points. Suggested reporting requirements are:

    - An AutoCAD map contoured (color coded) for total movement since the initial LiDAR survey.
    - An AutoCAD map contoured (color coded) for rate movement over last two-year period.
    - A spreadsheet showing control point survey results, and
    - Text discussing the results.

- The agreed upon survey interval will be revisited at the next annual meeting.

Cargill included a statement in the Annual Report, Page 3, that "Surface subsidence measurements continue to be performed in accordance with the Mined Land Use Plan. A baseline LiDAR survey of (subsidence) was completed in November 2021 and a repeat survey was completed in December 2023. A final report from this survey has not yet been received but will be made available to BOYD upon receipt. Previous surveys indicate that the mine subsidence is within expected ranges."

BOYD received the Cargill Lidar Subsidence report on March 20, 2024[8]. The report discusses the planning, data acquisition, post processing, accuracy, and changes (2021 to 2023) of the LiDAR elevations measurements. From the report, it can be determined that the final point cloud density is about one point every ft^2 and the accuracy is about ±2 in. (5 cm). Also, it can be seen in the final map showing elevation changes between -1.5 in. and +1.5 in. (Figure 29) that there is a fair amount of scatter between nearby points.

[8] Wingfield Scale and Measure Company, 2024, "Cargill – Cayuga Mine Aerial Lidar Subsidence Survey 2 – 2023", Dec2023-Cargill-Cayuga-SubsidenceSurvey-U3.pdf, March 20.

In the Cayuga Mine (as seen in the discussion in the “Closure Measurements” section above) in-seam closure readings range between 0 and 0.6 in./yr. Any closure in the mine will be greatly reduced by the depth and angle-of-draw before it appears as surface subsidence. Further, only a small portion of the mine is outside of the boundary of the lake and therefore, directly under the LiDAR elevation measurement area.

With the small amount of potential subsidence expected within two years (<<1.0 in.), and the accuracy of the LiDAR survey (±2 in.), it is not expected to be able to discern any subsidence from the two year LiDAR subsidence difference, and indeed there is no strong areal trend evident in the final report figures

Any surface subsidence derived from the closure in the mine would be expected to produce a very broad (hundreds of feet) subsidence trough. Given the scatter in the point data of Figure 29, it is difficult to see any broad-area trends. We suggest discussing other methods for displaying the LiDAR subsidence at the next annual meeting. An alternative display would be to average the LiDAR data over a larger grid (i.e., 100 ft x 100 ft) in order to highlight broad-area trends as would be expected with any potential mine subsidence.

Condition 17.a.(6)

Condition 17.a.(6) requires “Information regarding the source and volume of any water inflow into the mine, and the disposition of such water.”

Page 3 of the Annual Report notes that the salt brine “inflows are directed to a settling pond located on the 4-level of the mine. The water is then pumped from the settling pond to abandoned areas of the mine as well as active areas of the mine for dust control. A Mining Permit Modification Application was submitted to the DEC on June 30th, 2023 for the purpose of transitioning the water storage to the abandoned S3 mains and adjacent panels.”

Cargill lists the following water flows in the Annual Report:

- Production Shaft (#1 shaft) – 29 gallons per minute (gpm)
- Ventilation Shaft (#2 shaft) – Less than 1 gpm
- Service Shaft (#3 shaft) – 1 gpm
- ED Plant Concentrate discharge – Less than 1 gpm
- Other inflows – 2 gpm
- Total Water Inflow = 33 gpm

Condition 17.a.(7)

Condition 17.a.(7) requires “A summary of all other monitoring data required under the terms of this permit or Department SPDES permit issued to Cargill.”

Discussions on December 2, 2021 limited SPDES data given to BOYD to summary type.

Page 3 of the Annual Report notes that “During Calendar year 2023 Cargill experienced one exceedance. For the month of November outfall 001 chloride results from a sample were 41,000 mg/l vs a permit limit of 40,000 mg/l. NYSDEC was verbally notified of the exceedance on 11/28/23. A Non-compliance event form was submitted with the discharge monitoring reports to the NYSDEC via NetDMR in December. Follow-up sampling on 11/22/23 showed chlorides were well-under the SPDES permit limit as of 11/22/23 (21,000 mg/L).”

Condition 17.b

Condition 17.b requires “Upon transmittal or receipt, Cargill shall submit to the Department copies of all correspondence with the Mine Safety and Health Administration involving non-routine mining incidents as described below.”

Cargill notes on Page 3 of the Annual Report, “The Cayuga Mine has not received any citations or correspondence from MSHA regarding non-routine mining incidents as identified in section 19.”

Condition 17.c

Condition 17.c requires “Prior to undertaking any material change in the approved mining methods or techniques described in the documents listed in Special Conditions #3 & 4, Cargill shall submit to the Department a description of such modification in accordance with all applicable laws including the Uniform Procedures Act and State Environmental Quality Review Act.”

Cargill notes on Page 3 of the Annual Report, “The mining methods used at the Cayuga Mine have not been changed in the last year.”

Condition 17.d

Condition 17.d requires “Cargill must maintain a written record, and make it available to the Department upon request, of all written citizen complaints received by Cargill and any responses by Cargill thereto.”

Cargill notes on Page 3 of the Annual Report, “Cargill maintains a written record of citizen complaints that is available to the Department upon request.” No list of complaints was received.

Condition 18.a

Condition 18.a requires “Subsidence monitoring shall be conducted in accordance with the approved subsidence monitoring plan contained in the approved Mined Land Use Plan. Summaries of data collected shall be submitted to the Department as part of the Annual Report. Exceptions to anticipated trends shall be noted and explained to the Department after the data are collected and exceptions to anticipated behavior are established.”

Condition 18.b

And Condition 18.b requires “In situ measurements of rock mechanics shall be collected in accordance with the approved Mined Land Use Plan. A summary of the data collected shall be submitted to the Department as part of the Annual Report. Exceptions to anticipated trends in rock behavior shad be noted and explained to the Department after these data are collected and exceptions to the anticipated behavior are identified. If closure rates are higher than anticipated, Cargill shall increase the frequency of measurement in the affected area and submit for review and approved by the Department a plan and implementation schedule for corrective action.”

Cargill notes on Page 3 of the Annual Report, “All monitoring of subsidence and in situ measurements of rock mechanics have continued as outlined in 17.a.(4) and 17.a.(5)”.

Site Visit

BOYD recommends the following topics be addressed during the next site visit:

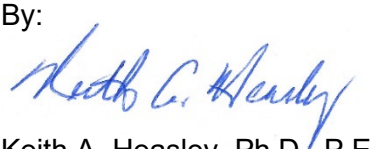
- Analysis and reporting format for the extensometer data.
- Frequency and reporting format of LiDAR and land survey subsidence data.
- Status of the S-3 Sump.

BOYD suggests that in-mine observations be completed for portions of the U-40B panel.

Please contact us if you require additional information or if we may be of further service.

Respectfully submitted,

JOHN T. BOYD COMPANY
By:



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