



December 27, 2011

Cargill Deicing Technology  
Cayuga Mine  
P.O. Box B  
191 Portland Point Road  
Lansing, NY 14882



Mr. Matthew Podniesinski  
Chief, Resource Development Section  
Bureau of Resource Management & Development  
Division of Mineral Resources  
New York State Department of Environmental Conservation  
625 Broadway, Third Floor  
Albany, New York 12233-6500

RE: 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

Dear Mr. Podniesinski:

Enclosed is an annual report required in accordance with the Special Conditions section (item numbers 13.a through 13.g) of DEC permit number 0-9999-00075/00001. This report will address each reporting requirement separately (13a.1, 13.a.2, etc.) and drawings are attached as required. As requested, all technical data associated with monitoring of mine stability will be sent to J.T. Boyd and Associates with attention to Dr. Vincent Scovazzo. A second copy of this report is in the mail to Steve Army, the Region 7 Mined Land Reclamation Specialist.

If any questions arise please bring them to my attention at your earliest convenience.

With Best Regards,

Russell Givens  
Mine Manager – Cargill Deicing Technology

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## Reporting, Monitoring, and Notifications

### 13.a.1 - Cargill Cayuga Mine Manager Certification:

I, Russell S. Givens, Mine Manager – Cargill Deicing Technology, certify that all mining activities, to the best of my knowledge, conducted during the reporting period from January 1, 2011 to present were in conformance with the DEC Permit # 0-9999-00075/00001 and the approved plans. No variances occurred and none were reported.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

12-28-2011

### 13.a.2 - Summary of all non-routine mining incidents:

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

On occasion, the underground production crews encounter rock structures that delay or hinder our mining plan. The Cayuga Mine continues to encounter a rock formation when mining to the east from the southern development (E-8 and E-9). As was discussed during the September meeting with the DEC, mining has been temporarily suspended in the southern workings pending evaluation of atypical microseismic noises heard there during July. Mining will resume there when Cargill has deemed it prudent to do so.

### 13.a.3 - 3 Year Mining Plan

A map is attached depicting the current and proposed mining for the next three years.

The Cayuga Mine is currently operating in the northern region of the mine. The mining is located in panels U-60 and U-62 to the west and U-63 and U-65 (NW-3) to the east. Upon completion of U-60 mining will be started in U-67. The U-65 panel has turned to the Northwest and is now the NW-3 main development. This unit will be pushed north to open up future mining panels.

### 13.a.4 - Summary of In-situ Measurements of Rock Mechanics:

The Cayuga Mine continues to collect mine convergence data in accordance with the guidelines previously established in the Mined Land Use Plan. Convergence stations are typically installed at the "face" of active tunnels in mining panels with a profile of three stations located in the center and edges of the panel. The convergence stations are usually read daily during the first week and then shifted to a weekly schedule until the next profile is installed. The initial profile will then be monitored on a monthly or quarterly schedule for the duration of mining of the panel. After abandonment of the panel, specific convergence stations are monitored quarterly. Currently, there are over 300 convergence stations being monitored. Once the data from the convergence stations has been collected it is evaluated both internally and externally for trends to ensure that each panel and the mine are behaving properly.

Roof sag, measured with extensometers, is also monitored as conditions warrant. This data is reviewed internally and externally as well.

Evaluations of weekly and quarterly convergence data indicate that no unusual trends have been identified and the mine is behaving as expected, with the exception of the U-40B and U12 areas. Since backfill placement in the U40B area has been completed the convergence rates have slowed and are trending back toward historical rates. The U-12 panel also shows higher than normal closure near the breakthrough with SW-2 and near the U-12A sub-panel. These areas are being monitored more frequently as we try to understand why the rates are increased. Both of these areas in U-12 were backfilled during the 1990's.

#### 13.a.5 - Summary of Subsidence Monitoring:

Surface subsidence measurements continue to be performed in accordance with the Mined Land Use Plan. A survey of the west shore of Cayuga lake was performed this year and the data is being evaluated now. Plans are being made to conduct subsidence surveys of the east shore line in the 2012 calendar year. Past measurements indicate that the mine is behaving as expected with no anomalous subsidence zones.

#### 13.a.6 Source and Volume of Water Inflow Into the Mine and Disposition of Such Water:

The following is a list of sources and associated flow rates of water into the Cayuga Mine:

- Production Shaft (#1 shaft) – 16 gallons per minute
- Ventilation Shaft (#2 shaft) – 4 gallons per minute
- ED Plant Concentrate discharge – 7 gallons per minute
  
- Total Water Inflow = 27 gallons per minute

All of the water is 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 on 4-level as well as to various areas of the mine for dust control. Recent volume calculations indicated that at our current rate of storage (about 11,000,000 gallons per year) we have approximately 17 years of disposal life remaining on 4-level. The underground storage pond levels have not been checked this year, so the pond limits are estimated based on the measured flow rates. See the attached underground (4 level) pond map.

Action plans are in place to continue to reduce the inflow into the mine over the next year. A system for collecting the #1 shaft water inflow and for pumping it to surface for processing has been installed but is not yet operational awaiting installation of the piping in the #1 shaft. Once the piping installation is completed, the system is expected to reduce inflow by an additional 6 gpm (~3,000,000 gpm).

#### 13.a.7 - Summary of SPDES Monitoring Data:

The following is a summary of the past year's outfall results (December 2010 – November 2011) and waste water treatment plant results (December 2010 – November 2011). There were two exceedances of the Chloride limit on outfall 001, in February and in July. In the event one happens they are reported to the DEC in two ways. Once an exceedance has been identified the DEC is informed via telephone of the occurrence. Each event is also captured in the monthly Report of Non-Compliance, which also lists corrective action taken. Several years ago, outfalls 004 and 005 were physically routed into outfall 003 so there is no longer any data from them. The data is included here as an attached spreadsheet.

13.b - Notification of Non-routine Mining Incidents:

There were no incidents meeting the guidelines for notification as identified in section 13.a.2.

13.c. - MSHA Correspondence Involving Non-routine Mining Incidents:

The Cayuga Mine has not received any citations or correspondence from MSHA regarding non-routine mining incidents.

13.d. - Changes in Mining Method:

There have been no changes to the Cayuga Mine layout in the past year.

13.e. - Surface Subsidence:

Surface subsidence surveys continue to be done in accordance with the Mined Land Use Plan. See section 13.a.5 of this report.

13.f. - In-situ Rock Mechanics Measurements:

See section 13.a.4 of this report.

13.g. - Written Citizen Complaints:

One written citizen complaint has been received by Cargill concerning the Cayuga Mine. Your office was notified of this complaint on December 12, and Cargill is investigating the concerns at this time. The complainant alleges that Cargill is mining beneath his property which is outside Cargill's mineral rights area. The nearest mining to the property in question was over 4,500 feet away and was abandoned before 1975.

# 2011 DEC Report Outfall Results (Dec 2010 through Nov 2011)

Red = exceedance

## CYANIDE

	OUTFALLS								
Permit Limit	001	002	003	004	005	006	007	008	012
Month/Year	1.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
December 2010	0.14	<.01	<.01	Combined	Combined	<.01	<.01	Eliminated	<.01
January 2011	0.14	<.01	<.01	with #003	with #003	NF	<.01		NF
February	0.26	<.01	NF			NF	NF		NF
March	0.051	<.01	<.01			<.01	<.01		<.01
April	0.038	0.014	<.01			<.01	<.01		<.01
May	<.01	<.01	<.01			<.01	<.01		<.01
June	0.17	<.01	<.01			<.01	<.01		<.01
July	0.83	NF	<.01			NF	NF		NF
August	0.13	NF	<.01			NF	NF		NF
September	0.37	NF	<.01			<.01	<.01		NF
October	0.66	<.01	<.01			<.01	<.01		<.01
November	0.071	NF	<.01			<.01	<.01		<.01

## CHLORIDE

	OUTFALLS								
Permit Limit	001	002	003	004	005	006	007	008	012
Month/Year	40,000 mg/l	10,000 mg/l	10,000 mg/l			5,000 mg/l	5,000 mg/l		5,000 mg/l
December 2010	5,000	16,000	330	Combined	Combined	280	300	Eliminated	640
January 2011	16,000	2,600	1,200	with #003	with #003	NF	1,300		NF
February	44,000	700	NF			NF	NF		NF
March	14,000	350	1,900			2,500	550		2,000
April	11,000	1,200	1,100			1,900	340		1,200
May	56	56	51			1,000	220		54
June	13,000	1,100	1,100			1,900	380		2,400
July	49,000	NF	1,000			NF	NF		NF
August	36,000	NF	1,100			NF	NF		NF
September	22,000	NF	1,600			2,950	1,500		NF
October	7,500	1,600	850			940	260		2,000
November	6,500	NF	720			1,100	370		1,700

## TDS

	OUTFALLS								
Permit Limit	001	002	003	004	005	006	007	008	012
Month/Year	80,000 mg/l	40,000 mg/l	40,000 mg/l			10,000 mg/l	10,000 mg/l		10,000 mg/l
December 2010	9,100	24,000	770	Combined	Combined	710	720	Eliminated	1,600
January 2011	20,000	5,000	2,900	with #003	with #003	NF	2,200		NF
February	70,000	18,000	NF			NF	NF		NF
March	21,000	840	3,500			4,300	1,100		3,700
April	16,000	2,500	2,400			3,300	770		2,200
May	210	200	210			2,200	740		190
June	20,000	2,700	2,600			3,100	990		3,900
July	53,000	NF	3,200			NF	NF		NF
August	3,200	NF	2,600			NF	NF		NF
September	31,000	NF	3,300			8,500	3,200		NF
October	13,000	3,000	2,100			2,100	800		3,400
November	11,000	NF	2,100			2,100	890		3,100

**ZINC****OUTFALL**

Permit Limit Month/Year	001 20 mg/l
December 2010	0.02
January 2011	0.1
February	0.42
March	0.28
April	0.063
May	0.02
June	0.2
July	0.1
August	0.2
September	0.2
October	0.2
November	0.035

**NON CONTACT COOLING WATER****Outfall #014**

Permit Limit	Min/Max Intake Water Temp. deg. F.	Min/75 Max Effluent Water Temp. deg. F	500 Max Gpm. Flow Rate Effluent Gross
Month/Year	Maximum 5 degree Increase intake to Effluent		

December 2010	52.6/53.3	54./54.5	350
January 2011	56.1/56.3	58.3/58.7	350
February	55.6/55.8	56.1/56.3	350
March	58.3/58.5	60.1/60.4	350
April	59.1/59.8	60.1/60.8	350
May	61.5/62.	62/62.5	350
June	64.3/66.8	65.5/67.1	350
July	NF	NF	NF
August	68.1/68.3	70.2/70.3	350
September	63.2/64.	64.1/65.	350
October	60.6/60.6	65./65.	375
November	61./61.	65./65.	375

**WASTE WATER TREATMENT PLANT****Outfall #009**

Item	Flow Rate Avg	BOD		pH		Total Suspended Solids		Settleable Solids Daily max	Total Residual Chlorine Max Daily Avg	Fecal Coliform # per 100 ml	
		Avg 30 Day	Max 7 Day	Min	Max	Avg 30 Day	Max 7 Day			Avg 30 Day	Max 7 Day
Permit Limit Month/Year	Report	30	45	6	9	30	45	3.0 ml/l	1.0 mg/l	Report	Report
December 2010	1258	27	27	6.9	8.3	19	19	<0.1	0.5	0	0
January 2011	1258	27	27	6.9	8.3	19	19	<0.1	0.5	0	0
February	1617	27	27	6.5	7.5	19	19	<0.1	0.6	0	0
March	966	0	0	6.5	7.2	20	20	<0.1	0.5	0	0
April	1052	7	7	6.6	7.6	12	12	<0.1	0.4	2	2
May	799	16	16	6.5	7.1	4	4	<0.1	0.3	2	2
June	872	20	20	6.5	6.7	16	16	<0.1	0.6	2	2
July	1129	9	9	6.5	7.7	6	6	<0.1	0.8	2	2
August	1148	15	15	7	7.3	4	4	<0.1	0.7	2	2
September	947	13	13	6.6	7.5	5	5	<0.1	0.7	2	2
October	1426	12	12	6.5	7.3	4	4	<0.1	0.3	2	2
November	737	17	17	6.5	6.7	24	24	<0.1	0.9	2	2



**Water Volume Calculation**  
**Ultimate Pond Potential Volume**  
**1-Jan-12**

Area	Total Area	Pillar Area	Fillable Area Ft2	Roof Height	Volume	Gallons
Far East Pond	6,598,278	2,831,750	3,766,528	12	45,198,336	338,083,553
Overflow Basin	832,750	64,788	767,962	10	7,679,620	57,443,558
Small Pond #2	128,409	0	128,409	7	898,863	6,723,495
Bowl Edge Pond	Not planned					
Small Pond #1	Not planned					
Southern Pond	Not planned					
Total Gallons						402,250,606
Incoming gallons per year @ 40gpm						21,021,000
Ultimate Pond Life (yrs) as of 6 Feb2001						19
Water added = (46 months/12 mo.) X 21,024,000 = (6 Feb 2001 - 1 Jan 2005)						80,592,000
Water added during 2005 (measured)						16,030,800
Water added during 2006 (measured)						18,272,329
Water added during 2007 (measured)						13,507,200
Water added during 2008 (measured)						10,886,400
Water added during 2009 (estimated)						10,401,624
Water added during 2010 (estimated)						8,894,769
Water added during 2011 (estimated)						10,669,680
Mar 2010 Adjustment (Final fill -1520 elevation to -1540 elevation)						55,753,706
Volume remaining						177,242,098
Remaining Pond Life @ 10,669,680 gal/yr.						16.6

Pond volumes are calculated by using the "area" function of Auto Cad. A polygon is drawn around the perimeter of the entire pond and Auto Cad is used to calculate the area of the polygon (in square feet). A polygon is drawn around each individual pillar within the pond limits and an area is calculated using Auto Cad. The pillar area's are subtracted from the total area to give the total pond area. Roof heights are determined by visual inspection, historical information where available, and the use of raw estimates. Water added values are estimates from the mine pumping system.