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Bureau of Mining Programs

AMD Treatment
New Stanton District Mining Operations

Mining and Reclamation Advisory Board
Meeting of April 19, 2018

Tom Wolf, Governor

Patrick McDonnell, Secretary

MRAB Field Trip- July 18, 2018

- Tentative Schedule
  - 9:00 Depart New Stanton DMO
  - 10:30 Arrive at Mount Morris Passive Treatment System
  - 12:15 Lunch in Washington, PA
  - 2:00 Arrive at Mathies H2O2 Treatment System
  - 3:45 Approximate return to New Stanton DMO

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Mt. Morris Passive Treatment System

Patriot Mining Company

Mt. Morris Surface Mine

SMP 30010101

Perry and Dunkard Townships, Greene County

Google Earth Tour- 12/31/2002

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Google Earth Tour- 6/6/2005

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Google Earth Tour- 6/7/2009

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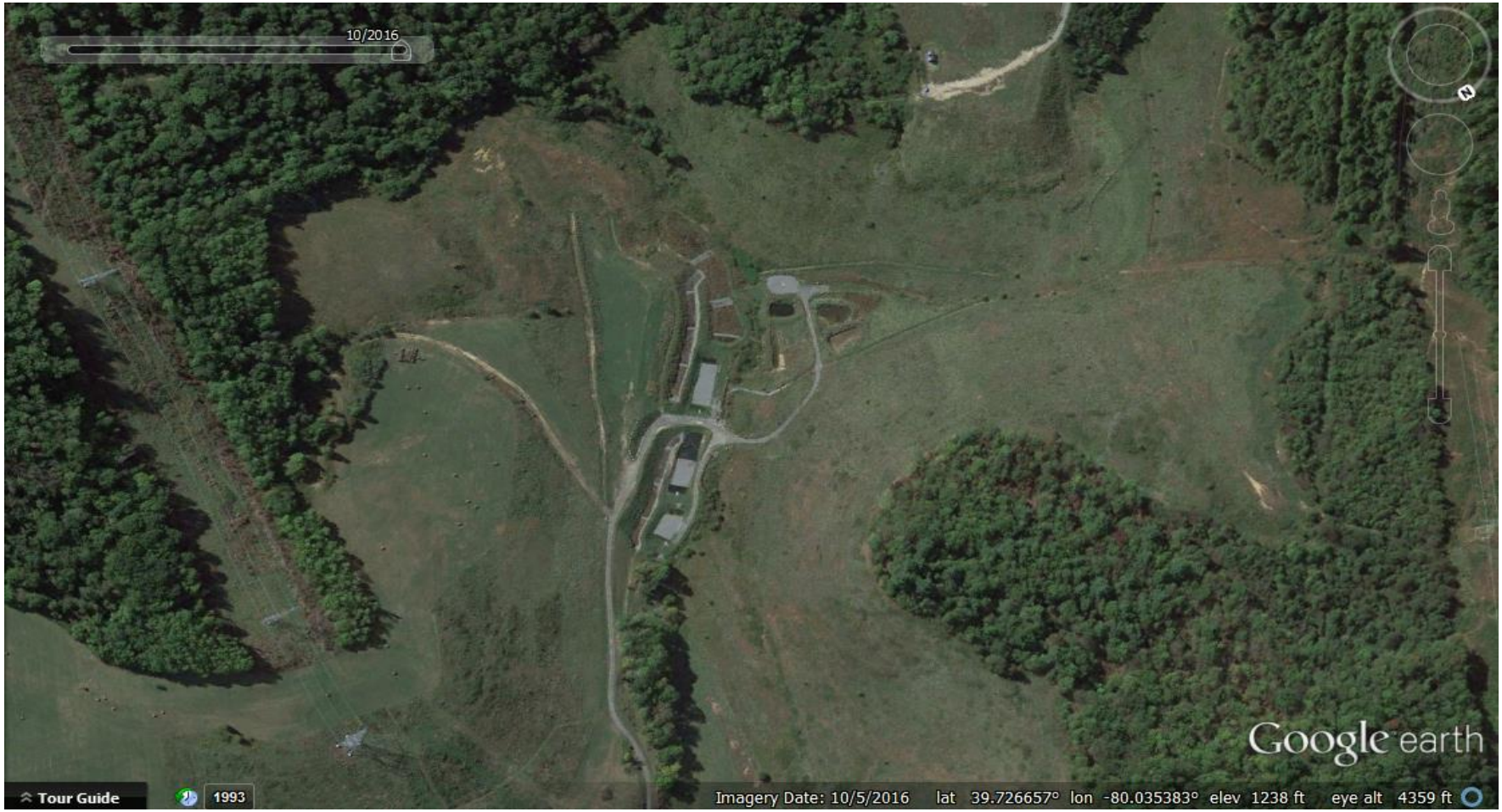
Google Earth Tour- 10/5/2016



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08.05.2015


Drain
W Seep
112
109
Outfall
08.05.2015

Gated Outlet Structures

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Mt. Morris Water Quality

Average Raw Water

- pH 5.5
- Acidity 100 mg/L
- Alkalinity 20 mg/L
- Iron 40 mg/L
- Manganese 30 mg/L
- Aluminum 3 mg/L
- Sulfate 1500 mg/L

Average Treated Water

- pH 7.7
- Acidity 0 mg/L
- Alkalinity 150 mg/L
- Iron 0.1 mg/L
- Manganese <0.1 mg/L
- Aluminum <0.2 mg/L
- Sulfate 600 mg/L

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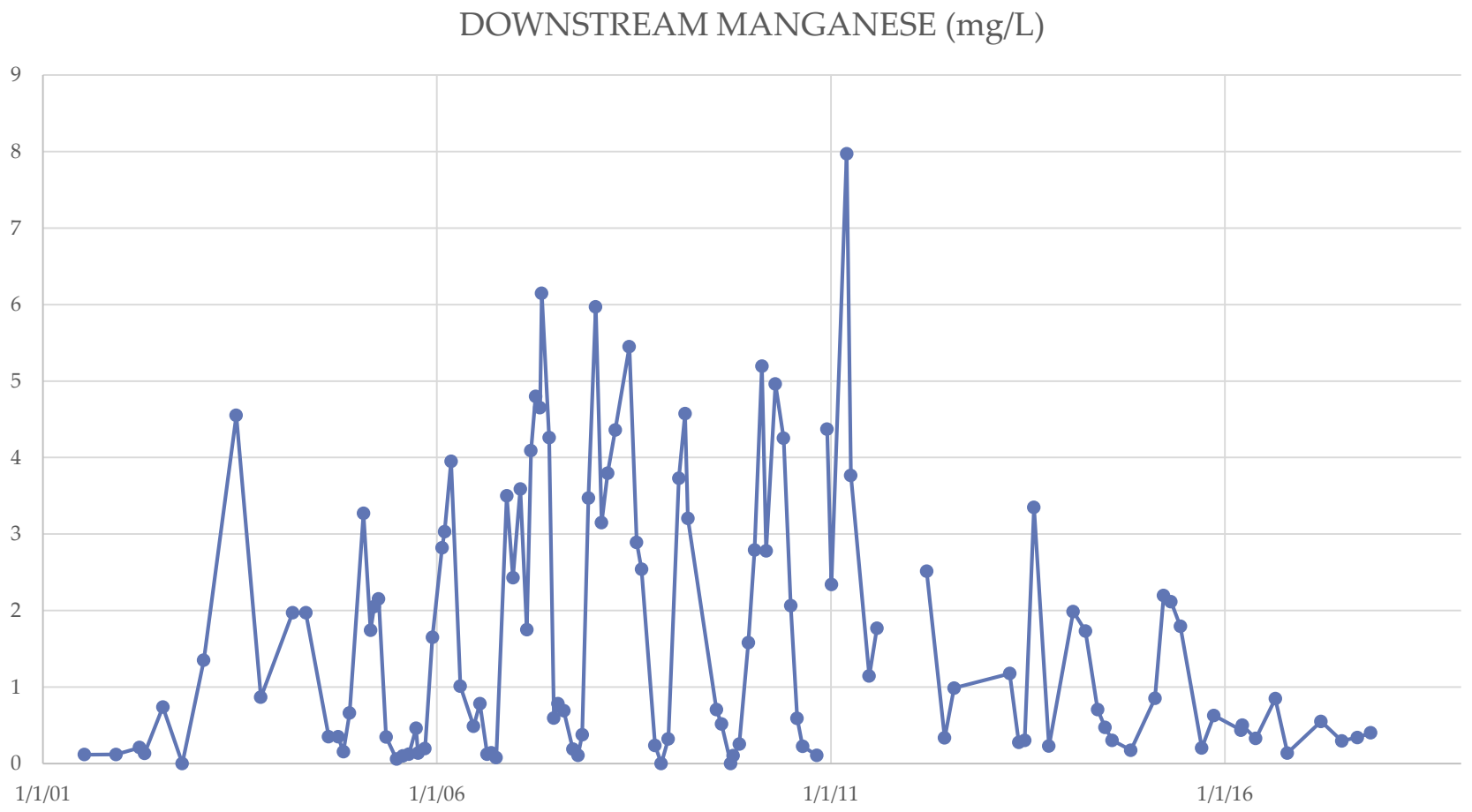
Downstream Water Quality



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Hydrogen Peroxide Treatment System

Mathies Mine

Union Township, Washington County

Tom Wolf, Governor

Patrick McDonnell, Secretary

Mathies Mine Treatment System Overview

Mathies Mine Water Quality

	1992 - 2010	2011 - 2018
Flow	1344.2 est. gpm	1196.1 est. gpm
pH	6.9	7.0
Alkalinity	294.1 mg/L	376.7 mg/L
Acidity	-294.6 mg/L	-310.4 mg/L
Iron	27.5 mg/L	46.1 mg/L
Manganese	1.8 mg/L	1.6 mg/L
Aluminum	2.2 mg/L	4.7 mg/L
Sulfates	1120.3 mg/L	862.3 mg/L
Total Suspended Solids	49.1 mg/L	89.5 mg/L

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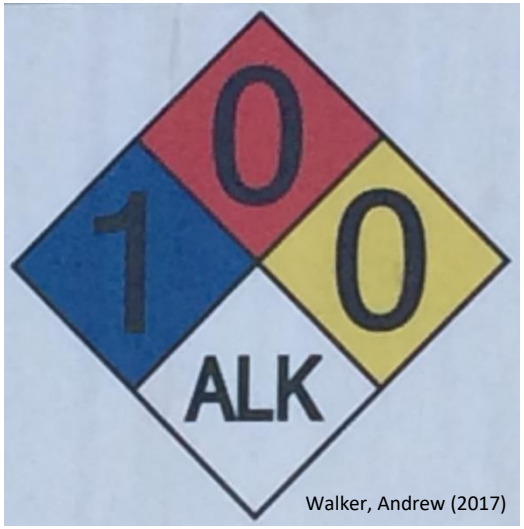
Mathies Mine Treatment System

Originally, the Mathies Mine discharge was treated with hydrated lime. In order to lower treatment costs and prolong the life of the treatment trust fund the Department converted the system to hydrogen peroxide.

The Use of Hydrated Lime

Hydrated Lime – used prior to 2011	
Pros	**Cons**
Cheap to purchase	Produces a heavy sludge
Alkaline	Not 100% calcium bicarbonate
Quicker settling times	Higher maintenance



Walker, Andrew (2017)


https://sciencing.com/lime-used-water-treatment-5023964.html (2017)


Koury, Daniel (2015)

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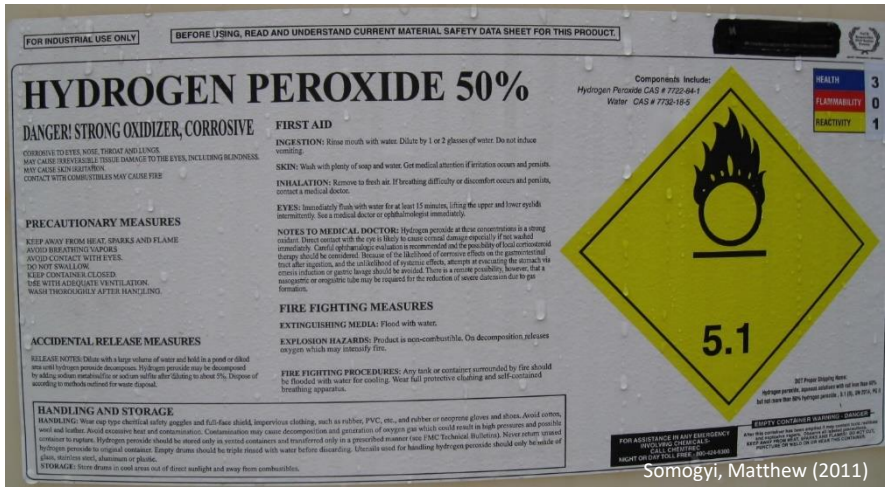
The Use of Hydrogen Peroxide

Hydrogen Peroxide – used after 2011	
Pros	**Cons**
Low maintenance	Expensive to purchase
Produces a very fine particle	Longer settling times
Diluted with distilled water	Highly reactive



Somogyi, Matthew (2011)

Somogyi, Matthew (2018)


Somogyi, Matthew (2018)

Installation of the Hydrogen Peroxide System

Beginning in 2011:

- A synthetic linear was installed in Pond 1
- Pond 3 and the wetland was constructed
- A concrete pad was poured to house the hydrogen peroxide tank and peristaltic pump
- Stainless steel injection lines were installed


Somogyi, Matthew (2018)

Somogyi, Matthew (2018)


Somogyi, Matthew (2018)

Pond 1

Pond 2

Somogyi, Matthew (2018)

Pond 3

Wetland

Somogyi, Matthew (2018)

Treated Water

	Lime (1992 – 2010)	Peroxide (2011 – 2018)
Flow	1344.2 est. gpm	1196.1 est. gpm
pH	8.0	7.4
Alkalinity	262.9 mg/L	366.4 mg/L
Acidity	Negative	-323.5 mg/L
Iron	2.8 mg/L	2.8 mg/L
Manganese	.6 mg/L	1.4 mg/L
Aluminum	.5 mg/L	.5 mg/L
Sulfates	1093.9 mg/L	887.7 mg/L
Total Suspended Solids	69.2 mg/L	23.3 mg/L

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Cost Anaylsis

Since the implication of the hydrogen peroxide system, the Department has saved an estimated **$150,000 annually** in chemical, electrical, and maintenance costs! Paired with a highly competitive hydrogen peroxide industry, our chemical costs continue to decrease.

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New Stanton District Mining Office
724.925.5500

For information on the Monview Mathies Trust Fund please visit
Monview Mathies Trust CO&A | Monview Mathies Trust Participation Agreement