Moorestown Drinking Water Crisis

Yu Chen, Harry Duffield, Anthony Morici, Patrick Rush, and Shawn Seroka

Background, and Sources of Contamination

Presented By: Anthony Morici

Background

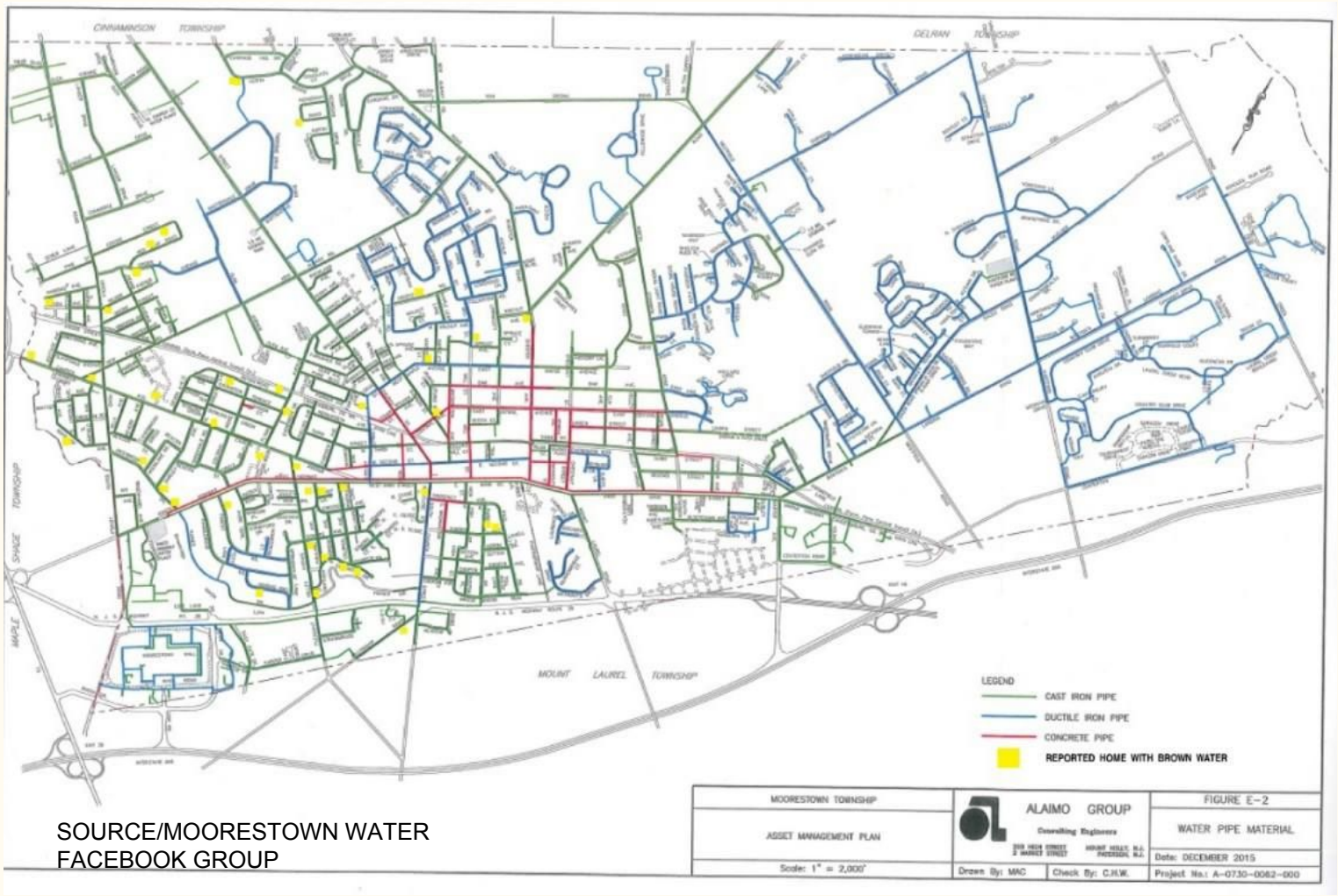
- In 2013, large amounts of Trichloropropane 1,2,3 (**TCP** 123) and Trichloroethylene (**TCE**) were found in wells in Moorestown NJ
- The Source of the contamination has yet to be discovered
- Since its discovery, the town has been annually purchasing an average of **344 Million Gallons** of water at a cost of **$2.2 Million**
- Plans have been put into place to correct the issue

SOURCE/MOORESTOWN WATER FACEBOOK GROUP

Potential Sources of Contamination

- Superfund site in Cinnaminson is considered to be a potential source for contaminants
- Councilman Mike Locatell states that it would be difficult to hold anyone responsible for the contamination when TCP was regarded as an unregulated contaminant.

SOURCE/GOOGLE MAP



SOURCE/MOORESTOWN WATER FACEBOOK GROUP

North Church Street Water Treatment Plant

- North Church Street has a capacity of treating 2.88 MGD
- Capacity is currently limited to 1.728MGD due to temporary treatment process
- The plant has undergone several openings and closing starting in 2014 due to findings of TCP, TCE, and gross alpha particles.

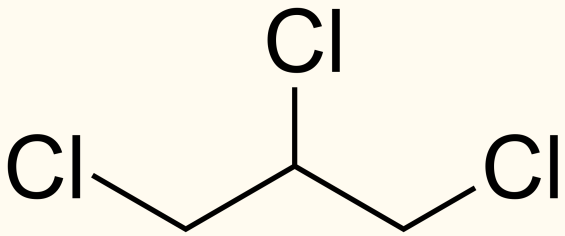
(Photo: Carol Comegno/Photographer)

Contaminant Findings, Properties, and Regulations

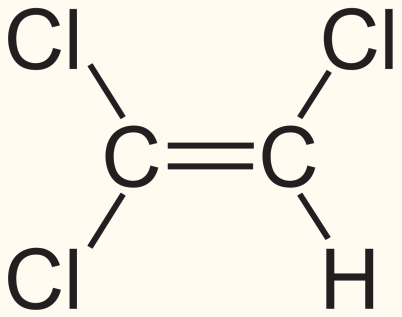
Presented By: Shawn Seroka

Contaminant Found in Moorestown Drinking Water

- Trichloropropane 1,2,3 (TCP 123)
  - A chlorinated hydrocarbon with high chemical stability
  - An impurity in agricultural pesticides and has been used as an industrial solvent and cleaning agent.
  - Not likely to absorb into soil, but may leach from soil into groundwater or evaporate from soil surfaces.
- Trichloroethylene (TCE)
  - A hydrocarbon compound commonly used as an industrial solvent.



Trichloropropane 1,2,3



Trichloroethylene

TCE Findings Since 2012

*Note current NJ Government restriction is .03 µg/L.

Moorestown North Church Street Water Treatment Plant

Trichloroethene (TCE) Results

#7 WELL & TP003013	DATE	WELL RESULT	POE RESULT
	Nov. 21, 2012	0.520 ug/l	0.190 Jug/l
	Jan. 2013	0.730 ug/l	0.370 ug/l
	Nov. 2013	1.070 ug/l	0.590 ug/l
	June 23, 2015	1.49 ug/l	See below
	Aug. 26, 2015	2.43 ug/l	See below
	Nov. 18, 2015	2.28 ug/l	See below
	Feb. 3, 2016	2.14 ug./l	See below
#9 WELL & TP003013	May 30, 2012	0.730 ug/l	0.390 Jug/l
	Jul. 25, 2012	0.650 ug/l	0.360 Jug/l
	Oct. 17, 2012	0.860 ug/l	0.460 Jug/l
	June 2013	0.830 ug/l	0.360 Jug/l
	Aug. 2013	0.870 ug/l	0.430 Jug/l
	Feb. 2014	1.16 ug/l	0.590 ug/l
	April 2014	1.49 ug/l	0.720 ug/l
	June 2014	1.55 ug/l	0.710 ug/l
	Aug. 2014	1.53 ug/l	0.710 ug/l
POE – TP003013	Jan. 17, 2008	N/A	0.250 ug/l
	Apr. 13, 2011	N/A	0.300 Jug/l
	June 23, 2015	See above	0.820 ug/l
	Aug. 26, 2015	See above	1.12 ug/l
	Nov. 18, 2015	See above	1.10 ug/l
	Feb. 3, 2016	See above	1.23 ug./l

TCP Findings Since 2013

*Note current Government restriction is .03 µg/L.

Moorestown North Church Street Water Treatment Plant – TP003013

1,2,3 Trichloropropane (TCP) Results

DATE	WELL RESULT	POE (finished) RESULT
March 12, 2013	N/A (well 7 running)	0.038 ug./l
Sept. 10, 2013	N/A (well 9 running)	0.051 ug./l
June 25, 2014	N/A (well 9 running)	0.066 ug./l
Sept. 10, 2014	N/A (well 9 running)	0.067 ug/l
June 3, 2015	ND (non-detect) (# 7 well)	N/A
June 3, 2015	0.103 ug/l (#9 well)	N/A
July 24, 2015	0.0700 ug/l (7 well)	0.0700 ug/l
Aug. 19, 2015	0.069 ug/l (7 well)	0.066 ug/l
Sept. 23, 2015	0.079 ug/l (7 well)	0.068 ug/l
Oct. 21, 2015	0.071 ug/L (7 well)	0.068 ug/L
Nov. 18, 2015	0.063 ug./l (7 well)	0.058 ug/l
Dec. 2015	Lab Equip. Failure	Notified Karen Fell DEP
Jan. 6, 2016	0.068 ug/l (7 well)	0.064 ug/l
Feb. 3, 2016	0.083 ug./l (7 well)	0.067 ug./l

Government Regulations

Trichloropropane 1,2,3 (TCP 123) and Trichloroethylene (TCE)

- Currently, NJ is one of three states to recognize TCE as a contaminate.
- EPA considers TCP as potential carcinogenic to humans
- The EPA has established enforceable regulations on TCE, imposing a maximum contaminant level (MCL) of 5 μg/L.
- Regulation requires public and private water systems to begin monitoring for the chemical in 2019 and for private wells to be tested during property sales or every five years for rental properties with private wells.

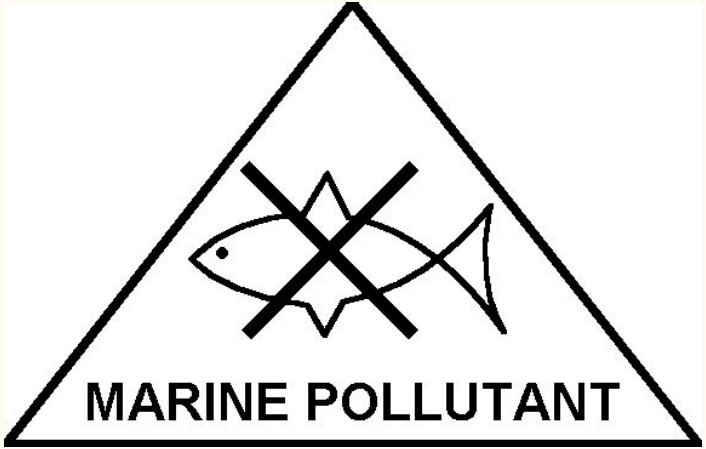
Health and Environmental Impacts

Presented by: Harry Duffield

Health and Environmental Impacts - TCP 123

Health

- Higher SG than water so it sinks to the bottom of aquifers
- According to studies on animals, long-term TCP exposure may lead to kidney failure, weight loss, and cancer.



Environment

- In freshwater, TCP can transform into allyl chloride then allyl alcohol which is toxic to aquatic life.
- Low abiotic and biotic degradation rates, so it can remain in water for a long time

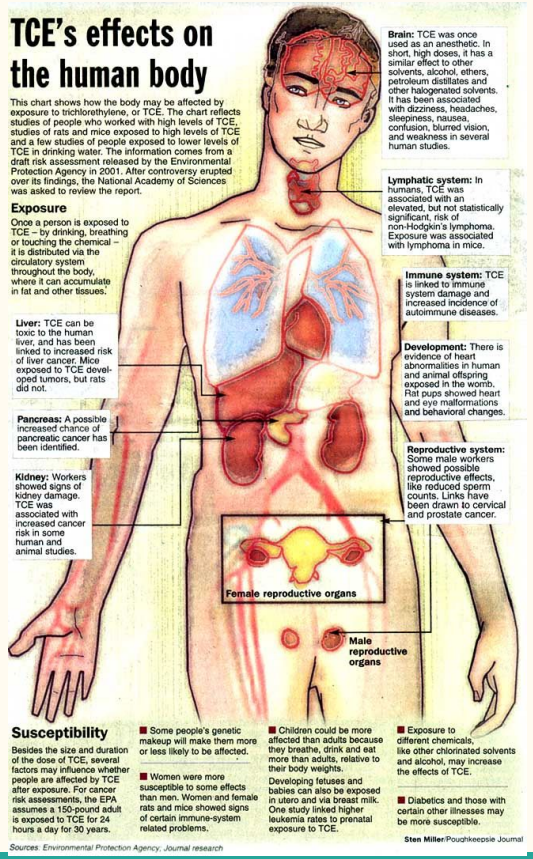
Health and Environmental Impacts - TCE

Health

- Carcinogenic in all forms of exposure
- Chronic exposure: effects on the liver, kidneys, immune system, central nervous system.
- Acute exposure: skin and respiratory irritation, lightheadedness, drowsiness, and headaches
- Can cause infertility in males and females and impaired fetal growth

Environment

- Not anticipated to absorb into the soil, however when it does so, it percolates rapidly.
- Toxic to aquatic life
- When vaporized, has a half-life of about a week, then forms phosgene-toxic to animals



Plans to Fix Treatment Plants

Presented By: Patrick Rush

Plant Improvements

- DEP has set a requirement for the construction on improvements for treatment of contaminants, begin latest January 1, 2019, and end latest January 1, 2020.
- North Church Street Renovations:
  - Modifications to existing pump and filter building
  - Installation of new pumps and motors for Well 7 and 9
  - Radium Removal System
  - Pressure Filtration System
  - Ultraviolet Advanced oxidation system
  - Granular Activated Carbon Filter
- Construction is being performed by Alaimo Group
  - Located in Mount-Holly, NJ

North Church Street Treatment Plant Future

- Well 7 and Well 9 will finally be able to operate at full function, with permanent filters
- The plant will be designed around treating the following chemicals:
  - TCE
  - TCP 123
  - 4-Dioxane
- Estimated $18.7 Million in renovations
- Max contamination levels for TCE & TCP 123 are 0.03 µg/L.

Moorestown Future

- By 2020, reduce its amount of water purchased from New Jersey American Water Company
- North Church Street as well as renovations to the two other treatment plants that serve the area are running at full capacity
- Water is treated and distributed to not only the standard set by the DEP but exceed the standard
- Confirm all contaminants of TCP 123 and TCE are removed
- Township find the source of the contamination in order get refunded for all necessary investments to save the town from a water crisis

Thank you, are there any questions?

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