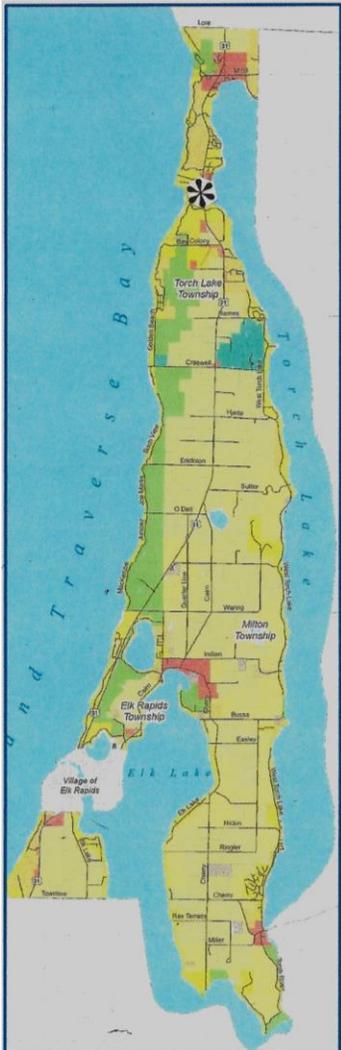


* Plume Location



This DEQ report was requested by TNN in response to residents' inquiries.

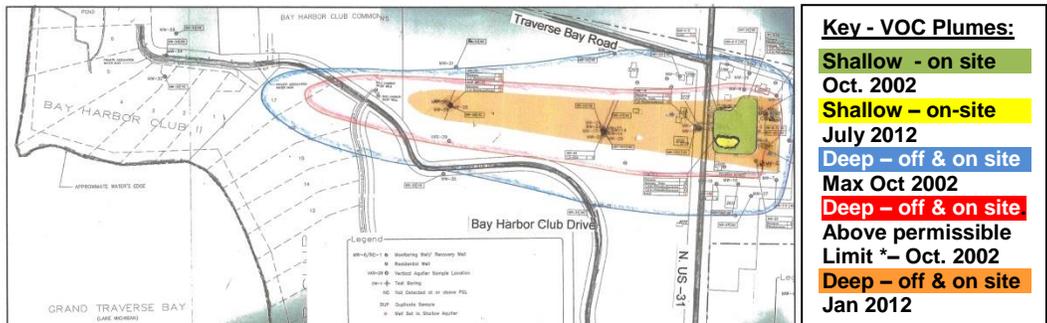
DEQ PROGRESS REPORT – VOC Plumes in Torch Lake Village

BY: Randall L. Rothe, Supervisor - DEQ-Remediation and Redevelopment - Gaylord.

Current situation. Three residential wells were contaminated by gasoline leaks from underground tanks of a former gas station - two in 1978 and one in 1992. These leaks resulted in a shallow VOC plume (green) on-site and a deep plume (brown) which migrated off-site. These water wells serving 20 homes in the Bay Harbor Club were relocated and replaced in June 2004 by the State of Michigan.

The shallow plume on the vacated gas station site is “shrinking” - the deep plume is also “shrinking”. The deep plume is no longer “pulled” west by water wells. VOC polluted groundwater did not reach Torch Lake - 800-feet east of the site, or East Grand Traverse Bay, 3,000-feet west of the site.

Deep and Shallow VOC Plumes Map



Source: Randall Rothe - DEQ

*Above Permissible Residential Clean-up Standards

What Was Done – 2010. Investigation revealed that two aquifers had been contaminated. Through 2010, vapors were “vacuumed” from water and soil in the shallow aquifer to eliminate contamination which did not meet safety standards for drinking water or groundwater. Impacted water wells for the Bay Harbor Club were relocated 1900 feet south, to an area that is out of reach of the plume.

2013 to 2015 A trailer-mounted remediation system was brought on-site in June 2013 and retrofitted through Oct. 2014. It bubbles air beneath the water table. Extraction wells in the soil above the water table collect volatile vapors for treatment through activated carbon prior to being discharged to the air. The treatment system ran successfully for a 10 day trial in October 2014.

An extended pilot test ran from May to July 2015 to determine parameters for full-scale operation. Groundwater sampling was included to determine effectiveness of the trailer-mounted device. The system was shut down on July 17, 2015 after vapors were found in nearby homes - vapors diminished after system turn-off

Tri-Township Zoning Districts

Green is **Timber Residential** (Torch Lake Township) - **Environmental** (Milton and Elk Rapids Townships)

TNN KEEPS YOU CURRENT
Conferences attended

- Annual Freshwater Summit
- Great Lakes Beach Assoc.
- ERCOL Watershed Protection Plan Workshop
- Great Lakes Council for Shoreline Protection
- Restore Our waters International

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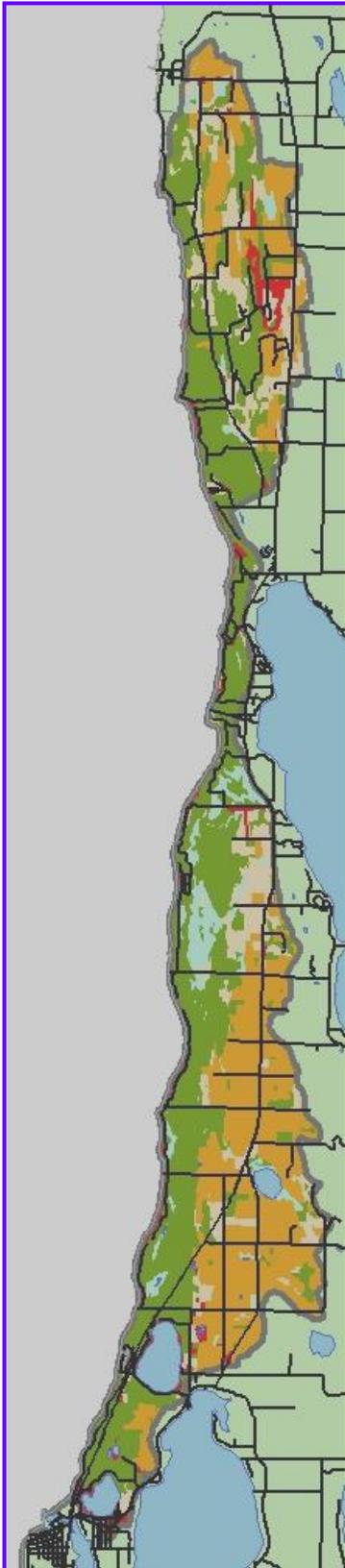
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E.A.S.T Watershed
Elk Rapids to Norwood



MI WETLANDS REGULATIONS – Elk Rapids, Milton, and Torch Lake Twps

By: Heidi Shaffer - Soil Erosion Control Officer in Antrim County.

Wetlands are critical to the pristine water quality and the up-north aesthetics we enjoy in Northern Michigan. These benefits, often referred to as wetland functions and values, play a vital role in recreation, tourism, and the local economy.

- **Flood & storm control** - hydrologic absorption & storage capacity of wetlands.
- **Wildlife habitat** - breeding, nesting, feeding grounds and cover for wildlife, water-fowl (incl. migratory), and rare, threatened, or endangered wildlife species.
- **Protection of subsurface water resources** – protect valuable watersheds and recharge ground water supplies.
- **Pollution treatment** - serves as a biological and chemical oxidation basin.
- **Erosion control** - serves as sedimentation area and filtering basin to absorb silt and organic matter.
- **Sources of nutrients** - water food cycle, nursery grounds, sanctuaries for fish.

It is important that to understand the significance of wetlands on property values, water quality and economic viability dependent on these valuable wetland features.

It is also important for owners to understand wetland protection laws to protect themselves and the environment. Wetland laws in general are below:

Part 303, wetlands are regulated by one or more of the following:

(State Law PA 203 as amended)

- **Connected to one of the Great Lakes** or Lake St. Clair.
- **Located within 1,000 feet of one of the Great Lakes** or Lake St. Clair.
- **Connected to an inland lake, pond, river, or stream.**
- **Located within 500 feet of an inland lake, pond, river or stream.**
- **More than 5 acres in size** - but not connected to one of the Great Lakes or Lake St. Clair, or an inland lake, pond, stream, or river.
- **MDEQ has determined that these wetlands are essential to the preservation of the state's natural resources and has notified the property owner** – but not connected to one of the Great Lakes or Lake St. Clair, or an inland lake, pond, stream, or river, and less than 5 acres in size.

Make sure you know your property. If you are within 1000' the Great Lakes, a permit is required from the MDEQ to dig in or fill a regulated wetland. Matt Kleitch is the DEQ representative for Antrim County. His email is kleitchm@michigan.gov. If you are within 500' of a river, lake or stream and do earthwork, obtain a soil erosion control permit from heidi.shaffer@macd.org; please phone 231-533-8363 to answer environmental questions and obtain help and direction.

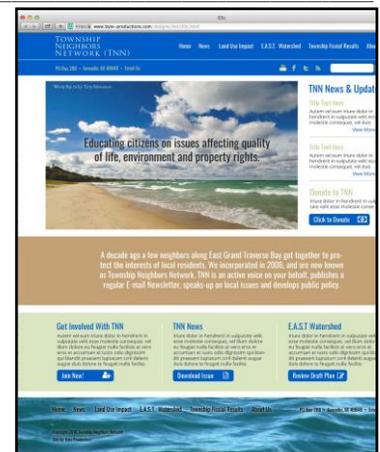
NEW TNN WEBSITE COMING - Built especially for TNN members and the public. Like our locale, it is an “island” with roads/bridges to help visitors to get there. Here are new and improved features:

Optimized Search Engine: high performance - great user experience – key words – web authority.

Great Content: tell the TNN story - make our brand more authentic – timely updates.

Marketing: Nurture connections –attract people with new posts, downloads, case studies, photos.

Facebook: Help people to converse with TNN.



Great Lakes remarkably ice-free compared to past two winters.

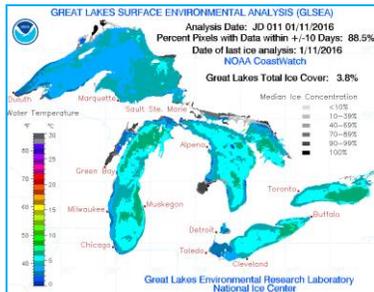
BY: Scott Sutherland Meteorologist/Science Writer

Wednesday, Jan. 13, 2016, 1:44 PM

It's been cold and snowy around the Great Lakes as of late, but despite that, the lakes remain remarkably ice-free for this time of year.

One indication of how cold winter has been so far is to look at exactly how much of the Great Lakes have frozen over. Look back just a year or two, and the Lakes were already well on their way to being in the top 5 years on record for annual ice cover.

In contrast, as of Jan. 13, there is hardly any ice found on the lakes.



Ice on Great Lakes, Jan 11, 2016.

Source: NOAA - GLERL

Only 3.8 per cent of the water is frozen over, compared to 22.5% in 2015 and 38.3% in 2014.

All of this open, relatively warm lake water has been feeding lake effect snow streamers as the winds blow across the lake and tap into that abundant supply of moisture.

Low ice coverage so far this winter, is only slightly behind 2012, when a mild winter meant ice cover reached 3.7% per cent by Jan.15, and maxed out at 12.9% for the year.

Will this year's ice cover get down that low again? Or will cold weather bring about ice growth like 2013 – 3-4% range in Jan. climbing to over 38% by mid-Feb. **Time will tell!**

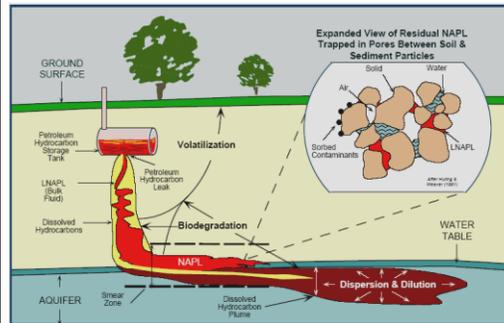
Sources: NOAA GLERL | NASA Worldview

DEQ PROGRESS REPORT – VOC Plumes in TL Village (Cont'd from Front Page)

BY: Randall L. Rothe, Supervisor - DEQ-Remediation and Redevelopment - Gaylord.

Schematic Cross-Section of a Plume

BY: R. Stewart-Environmental Science in 21st Century.



Shallow aquifer – 35/40 ft. down.
Impact on & off-site, has migrated south by east and west over time. Connects to the deep aquifer just south of the site and is the cause of contamination of the **deep** aquifer.

Deep aquifer – 60/130 ft. down.
Impact off-site - has migrated south-west of the site. It was “pulled” by now relocated water wells. Has receded.

Next Steps in 2016: Local health department continues quarterly monitoring of home water wells nearby. The initial sampling of water wells occurred in 1978. Investigations continue to determine the cause of the vapors in homes - and whether treatment system failure(s) led to vapors. The system will not be restarted until data and operations have been analyzed. In February, additional soil borings will commence and also air and ground-water sampling. More monitoring wells, and vapor sampling points will be added. Once analysis is complete, decisions will be made as to the next steps including public review:

- Feasibility studies – compare current to historic conditions,
- Can the current system remove contamination mass on-site?
- Will additional system modifications will be required?
- Or is a different treatment system needed to remediate contamination.

DEQ will report progress in Autumn TNN News and at Community Meetings.

Historical Note: *Torch Lake Township. Contaminant leaks were from past under-ground storage tanks at the vacated TL Standard gas station; 2748 N. US-31. These tanks had not been registered with the State and had been removed years ago prior to regulations to notify DEQ*

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