

Perfluorinated Chemicals in Drinking Water Wells in Oscoda Township

Responses to Community Concerns as of June 6, 2016

During the March 23, 2016 open house and public meeting about the perfluorinated chemical (PFC) contamination issue at the former Wurtsmith Air Force Base in Oscoda, several community members gave a list of questions to the agencies involved. The responses are listed below. The agencies and offices involved are:

- Charter Township of Oscoda
- District Health Department #2 (DHD2)
- Michigan Department of Environmental Quality (MDEQ)
 - Office of Drinking Water and Municipal Assistance (ODWMA)
 - Remediation and Redevelopment Division (RRD)
 - Water Resources Division
- Michigan Department of Health and Human Services (MDHHS)
- Oscoda Airport Authority (OAA)
- U.S. Air Force (AF)

Please contact District Health Department #2 with any additional questions at 989-362-6183. As needed, they will forward the question to the appropriate agency.

Acronym List

AF	(United States) Air Force
AFFF	Aqueous film-forming foam
CWS	Community Water Supply
DHD2	District Health Department #2
EPA	(United States) Environmental Protection Agency
GAC	Granular Activated Carbon
HA	Lifetime Health Advisory Level
HSRUA	Huron Shores Regional Utility Authority
MDEQ	Michigan Department of Environmental Quality
MDHHS	Michigan Department of Health and Human Services
MDNR	Michigan Department of Natural Resources
NPL	National Priorities List
OCC	Oscoda Community Center
OWAA	Oscoda Wurtsmith Airport Authority
PFAS	Per- and polyfluorinated alkyl substances, also known as PFC
PFC	Perfluorinated Chemical, also known as PFAS
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonic acid
WAFB	Wurtsmith Air Force Base

General Questions

- 1. Is this the same problem that caused the former Wurtsmith Air Force Base (WAFB) and YMCA Camp to be put on municipal water years ago, or is this a newly found situation?**

MDEQ: The off base homes, businesses and the YMCA camp were originally offered a municipal water hook-up in response to fuel and industrial solvent contamination of the groundwater east of the former base. In 1997, the former base drinking water system was switched to the Huron Shores Regional Utility Authority (HSRUA) municipal drinking water system for operational reasons. Neither switch was in response to PFC contamination. PFC contamination was first discovered by the MDEQ at the former base's fire training site in 2010, long after the municipal water was provided to residents.

- 2. What was the initial cause of the leakage/plume?**

MDEQ: There are several plumes of PFCs. Most appear to be from past use of firefighting foam. These foams were used at many locations on the former base, causing contamination to the ground and groundwater. PFCs may be also present in and coming from the base landfills. The Air Force is investigating the sources of the PFC contamination.

- 3. Where is the new plume coming from?**

MDEQ: The PFCs that were recently discovered in residential wells are coming from many places where firefighting foams were used on the base. Examples include former air plane hangars, firefighting training sites, fuel storage areas, fire equipment cleaning sites, fuel filling areas, and jet engine testing buildings. It is likely there are other places where PFCs were used on the base in addition to those listed above. The Air Force is investigating these as potential sources of the PFC contamination. MDEQ staff will be providing oversight of the Air Force's investigation and will be taking duplicate samples to check the Air Force's findings.

- 4. How can a 20+ year old problem cause a bigger problem now?**

MDEQ: This is an important question for understanding the problem and the challenges ahead. PFCs are still in the environment from use at the base from at least the 1970s, and will continue to be in the environment without human intervention. PFCs are very challenging to clean up as they are nearly indestructible in the environment. That is one major reason they are used in so many products. As an example, they do not breakdown in high temperature fuel fires. They continue to work when other substances will break down.

AF: The PFC issue was unknown in 1993 when the base closed. The EPA issued a Provisional Health Advisory level for PFCs in 2009, more than 16 years later. The Air Force is working to determine whether PFCs pose a risk to drinking water supplies of communities associated with the former WAFB. If PFCs from Air Force activities pose a risk of

contamination to community drinking water supplies above standards, the Air Force will take action to protect those supplies.

MDHHS: The EPA recently updated the Provisional Health Advisory levels for two PFCs (PFOA and PFOS) to final lifetime Health Advisory (HA) levels. An HA is the amount of a chemical in drinking water that is not expected to harm human health but is *not* an enforceable drinking water standard. The HA for PFOA and PFOS is 70 parts per trillion, for either chemical alone or in combination with the other.

At this time, no drinking water samples from residential wells in the Oscoda area have exceeded the HA for PFOA and PFOS.

5. Is there an underground storage tank that has cracked causing a new leak into the ground water & runoff? What material was used for storage?

MDEQ: Normally these chemicals did not get into the environment from tanks or drums at the former base. They were released by the Air Force as part of the normal operations at the former base. The Air Force and the Navy are finding these chemicals at many of their former and currently active bases.

AF: None of the potential PFC release sites identified at the former WAFB have been associated with leaking tanks above or below ground.

6. Could these have cracked/leaked and it not have been known?

AF: No tank-related releases have been identified.

MDEQ: These chemicals were released mostly during normal operations of the base. The Air Force, with MDEQ oversight, is conducting a major groundwater investigation at the former base to determine where these chemicals escaped into the environment. If tanks leaked that had PFCs, it is expected that they will be found during this investigation or in future investigations.

7. If storage bins, have they been located and removed?

MDEQ: It is not likely that storage sites caused many, if any, of the known contamination at the base. There are still containers of the material on the former base as they are part of the fire suppression systems at the current airport and hanger systems. However, the Air Force will be removing the material in the next few months.

8. What can be done to stop this problem?

AF: The Air Force has installed a groundwater extraction system at the former fire training area that captures the PFC contamination before it reaches Clark's Marsh. An investigation is underway to assess if other plumes threaten wells at levels above EPA's Health Advisory levels.

9. What are the authorities involved doing about this problem?

AF: The Air Force has launched a three-stage program to identify possible PFC discharges, determine if drinking water supplies are or could be affected, and implement solutions to prevent contamination, if needed. Our team identified the fire training area where PFCs in firefighting foam were discharged in sufficient amounts to cause contamination. We installed a groundwater extraction system that captures the PFC contamination and filters it out before it reaches Clark's Marsh. Additionally, the Air Force has conducted a detailed records review to identify releases, screened drinking water wells downgradient of the base, is conducting field investigations to understand plume locations, and will use the investigation data to assess potential impacts. If any drinking water wells are impacted above EPA's Health Advisory levels, the Air Force will immediately provide bottled water and work with the owner to implement a long-term alternate water supply.

MDEQ: MDEQ is aggressively working with the Air Force to stop the discharge of PFCs to surface water, is actively asking the Air Force to provide a remedy to this problem, and is assisting the Air Force in further defining the extent of PFC contamination on and around the base. Additionally, MDEQ is offering PFC sampling of private drinking water wells at no cost to homeowners and working closely with MDHHS to provide residents with long-term drinking water solutions.

DHD2: District Health Department No. 2 has implemented a system for those affected by the Advisory to have access to donated bottled water, and as available, a free 5-gallon water container and a location to fill containers with municipal water.

MDHHS: MDHHS's role is to evaluate the public health impact of the contamination, to determine if and how people are being exposed, if that exposure might be harmful, providing information, and working with other agencies and the community to prevent harm to human health.

MDHHS evaluated the PFC data for well water from the area between the former WAFB and Van Etten Lake and recommended that people not drink or cook with well water that has PFCs from the former WAFB in it. This recommendation is *not* based on the amount of PFCs found in the samples but is based on the uncertainty of the situation, as described in the MDHHS fact sheet, "[Perfluorinated Chemicals \(PFCs\) in Drinking Water Wells Near the Former Wurtsmith Air Force Base](#)".

Briefly, there are much higher amounts of PFCs in groundwater on the base, which is upstream from residential drinking water wells. It is not known how long PFCs have been in the residential wells, what the amounts were in the past, or what they could be in the future. Research on animals and studies in people who have been exposed to PFCs shows there may be concerns for public health. PFCs can stay in the body a long time (years). MDHHS has provided legislators with information about filters as one possible interim measure.

MDHHS first became involved at the former WAFB in 2012 when fish (pumpkinseed and bluegill) sampled from the ponds in Clark's Marsh were found to have high levels of PFCs.

MDHHS issued a “do not eat” advisory for fish caught from the Clark’s Marsh ponds and also for non-migratory fish in the lower Au Sable River (downstream of Foote Dam to the mouth).

All of MDHHS’s materials can be found at their webpage for the former WAFB, <http://www.mi.gov/envirohealth>, under “In the Community”, then “Health Assessments and Related Documents” and scroll down to “Former Wurtsmith Air Force Base”.

Oscoda Township: An update on the Township’s actions to date on behalf of our affected citizens can be found in an excerpt from the Superintendents March 28, 2016 board meeting report:

PRIVATE WATER WELL / PFCs UPDATE

Following discussion at our work session of March 16, 2016 some new developments relative to the private water well/PFCs situation have taken place. First, in order to address short-term potable water access concerns, the Township has collaborated with the local health department to make municipal water available to affected residents. This will occur at the Community Center (OCC) based upon a voucher distribution process established by the local health. This arrangement was publicly explained at the informational meeting of March 23rd regarding this subject. We will need to consider an alternate source of water assuming this program is maintained given that the OCC typically closes at the end of April. Additional information regarding assistance from other agencies may have an impact on necessity to continue service provision.

Board members will find attached a preliminary estimate of cost from Spicer for two water main expansion projects intended to provide municipal water to affected residents. It should be noted that this is a conceptual estimate and refinement will be necessary at some point in the future. The estimate is based upon providing service to properties with private wells with positive test results based on current information. Because the private well testing program has not been completed there is potential for the "project" to require expansion in the future if it moves forward to construction. It is noteworthy that several affected properties appear to have access to municipal water currently. To that end it should be further noted that a portion of the water main to which connection could be made is owned by the Huron Shores Regional Utility Authority. Accordingly, approval to access these water mains will need to be sought and obtained from the authority. .

Also attached for the Boards’ information is a proposal from Weston and Sampson to provide environmental consulting services. This company provides services to the City of Portsmouth New Hampshire in relation to the former Pease Air Force Base. Based on feedback from the consultant and city representatives the firm appears to have experience directly relevant to the scenario emerging in Oscoda. There are undoubtedly other companies with appropriate qualifications but this should provide some perspective on potential services available and related costs.

Finally, it should be noted that there has been an active outreach to State and Federal legislative representatives. The intent of this effort is to make them aware of the situation and, more importantly, to establish a dialogue about potential long term solutions and funding to support them. As indicated at the March 23rd informational meeting, there appears to be a major policy difference between the State and Federal governments relative to this topic. Legislative involvement will hopefully be of benefit in bridging this gap.

The Township is awaiting feedback from inquires to other agencies as referenced above.

10. How long will the Military /U.S. Government remain involved in the water monitoring?

AF: The Air Force will be involved with all aspects of PFC management until releases from the base no longer pose an unacceptable risk to human health or the environment. The investigation and subsequent response is expected to take years.

11. If/When the Military stops monitoring, who will take lead responsibility?

MDEQ: Monitoring of this problem is in the early stages of development. There is no foreseeable end to the monitoring of this problem by either the Air Force or MDEQ.

AF: The AF will not stop its PFC management efforts until there is no longer a risk from base-related PFC releases.

12. The Township Board stated in the March 15, 2016 Board Meeting that they had not been contacted by either the Iosco Health Department or the State of Michigan regarding this problem, going forward will they be included in the information stream?

All Agencies: Communications between agencies and township officials have occurred, however the situation evolved rapidly, requiring quick action by the agencies and resulting in some gaps in relaying information to local leaders. We apologize for these missteps and will strive to be more diligent in keeping community leaders and members up to date. All of the agencies involved at this site are committed to working together for the benefit of the community.

13. Because of our lack of confidence in the State level due to the Flint water problems, has the Federal Environmental Protection Agency (EPA) been brought into this?

MDEQ: Before the lifetime Health Advisory levels (HAs) for PFOA and PFOS were released by EPA, MDEQ reached out to the EPA and formally asked them to expedite the release of long-term health values for PFCs. These two compounds are currently the only PFCs to which the EPA has assigned an HA level.

14. Can we request the Federal EPA be involved starting now if they aren't?

MDEQ: At one time the EPA was engaged in activities involving the former WAFB. Due to national priorities, the EPA has deferred to State agencies to take the lead role.

15. Who has to make a request for Federal EPA involvement?

MDEQ: Anyone can contact the EPA and make a request. Currently, the former Wurtsmith Air Force Base is not on the EPA Superfund Program's National Priorities List (NPL). The MDEQ has had recent discussions with EPA Superfund Region 5 about the possibility of adding the site to the NPL. Local input and preferences are an important factor taken into account by the EPA and State when determining whether to proceed with placing a site on the NPL.

16. What involvement and responsibility does Kalitta Air have in this problem?

OWAA: Kalitta Air has no responsibility for the PFC contamination problem. The PFC contamination originates from U.S. Air Force use of the firefighting agent known as Aqueous Film Forming Foam (AFFF). Those activities occurred prior to the 1993 closing of Wurtsmith Air Force Base. Kalitta Air began leasing former WAFB properties during 2002. There have been no fuel fires or aircraft crashes requiring use of AFFF or other incidents in which PFC contamination has been released as a result of Kalitta Air operations.

17. Has anyone looked into what Kalitta is dumping down their drains or on their grounds that maybe causing new problems? Or adding to the existing problem?

18. What responsibility does the Wurtsmith AirPort Authority have?

19. Since these 2 entities have daily operations running, who has audited their practices

20. When were the last inspections/audits conducted?

21. Where can the public access those reports?

The response to questions 17-21 is found below.

OWAA / Kalitta Air: Commercial airlines, aircraft maintenance facilities and airports are intensely regulated and inspected operations. In addition to conforming to applicable sections of the catalog of Federal Aviation Regulations, Kalitta Air and Oscoda-Wurtsmith Airport are also tasked with satisfying federal and state mandated environmental protection awareness and protection programs. An important part of Kalitta Air and Airport's procedures begins during employee indoctrination when all newly hired employees are initially trained about proper storage, handling and disposal of materials that could impact the environment. All employees then attend on-going refresher awareness training each year - - at minimum.

Oscoda-Wurtsmith Airport and Kalitta Air operate in compliance with environmental protection regulatory requirements and oversight - - which include; securing permits, implementing best management practice plans / procedures and passing recurring

inspections. Those environmental protection programs, and the agencies that oversee them, are listed below:

‘Spill Prevention Control and Countermeasures Plan’ in accordance with federal EPA regulations 40 CFR Part 112.

‘Storm Water Pollution Prevention Plan’ in compliance with conditions of a ‘National Pollutant Discharge Elimination Systems’ (NPDES) permit that is issued and monitored via Water Resources Division of Michigan Department of Environmental Quality (MDEQ).

‘Hazardous Waste Management and Disposal Plan’ in compliance with MDEQ Administrative Rules Part 111 and 121.

Above Ground Storage Tank management and monitoring in accordance with Michigan Public Act 207 of 1941 and as inspected by Michigan Bureau of Fire Services.

About PFCs

1. What chemicals make up the group being called PFC’s?

MDHHS: PFCs are known by a variety of names and other abbreviations. The whole class of chemicals is called “per- and polyfluorinated alkyl substances” or PFASs. MDHHS uses the term “PFCs” which stands for “perfluorinated chemicals.” The main chemical structure of PFCs are chains of carbon molecules, of varying lengths, with fluorine molecules attached. The carbon-fluorine chemical bond is extremely strong, making it difficult for these chemicals to break down in the environment. They are very persistent, which means they stay in the environment for a very long time.

PFCs have been used in stain-resistant and water-resistant materials (such as Stainmaster® carpeting, Scotchguard®, and Goretex®), as well as fire-fighting foams, surfactants (such as detergents and foaming agents), and many other materials and processes.

2. Can the PFC chemicals be neutralized with additional chemicals? Or filtered?

MDEQ: There are no known methods to chemically neutralize PFCs in drinking water. While many PFCs may effectively be removed from drinking water by adsorptive and filtration treatment methods, the better long-term method to minimize risk is to replace affected private drinking water sources with a connection to a municipal water supply such as HSRUA which is overseen by certified personnel, regularly monitors for chemicals of concern and bacteriologic quality, and reliably provides consistent service.

If interim treatment measures are needed, most (but not all) PFCs are effectively removed from drinking water by a combination of granulated activated carbon (GAC) filters and reverse osmosis (RO) membranes. There are many of these systems that can be installed in individual homes.

3. What are the cleanup efforts and how will these costs be absorbed?

AF: See the response to question 9 on page 3 for a summary of Air Force actions. These actions are funded under the Air Force environmental cleanup program.

4. What are the health effects from both short and long term exposure to this group of chemicals?

MDHHS: Animal studies have shown that PFCs can affect the animal's liver, pancreas, thyroid, and endocrine (hormone) system. Human studies on people who have been exposed to PFCs suggest the chemicals could affect the endocrine and immune system, affecting fertility and cholesterol, and could harm a developing fetus and child. Some PFCs may increase the risk of cancer. This [fact sheet](http://www.atsdr.cdc.gov/pfc/docs/pfas_fact_sheet.pdf) (http://www.atsdr.cdc.gov/pfc/docs/pfas_fact_sheet.pdf) answers some frequently asked questions about PFCs, also known as PFASs.

The Health Advisory levels for PFOA and PFOS are protective of both short-term and long-term exposure. They are protective of a developing fetus, a breast-fed or formula-fed baby, growing children, and adults.

Swimming Safety

1. We are very concerned about using the lake for swimming, for ourselves, family, and friends. How does this affect watersports/swimming, etc.? Is this still safe? What about for children/people with compromised immune systems, open wounds and pets who may drink the water?

DHD2: The MDHHS Toxicologist has informed District Health Department No. 2 that the water is safe to swim in and skin contact is not an issue.

MDHHS: Based on our understanding of PFCs, skin contact with water that has PFCs in it will not harm you.

2. How will visitors to the lake and the State campground (with 2 boat launches) be notified of this water problem and the “don't eat the fish” recommendation?

MDHHS: Recreational use of the lake is encouraged. Based on our understanding of PFCs, skin contact with water that has PFCs in it will not harm you. Van Etten Lake is *not* used for drinking water.

MDHHS has not found higher levels of PFCs in fish caught from Van Etten Lake and has not issued “do not eat” guidelines there. MDHHS has issued a “do not eat” recommendation for fish caught from Clark's Marsh and resident fish caught from the lower Au Sable River (fish that in the river year round). To find the MDHHS “Eat Safe Fish” guidelines, visit <http://www.mi.gov/eatsafefish>.

Well Related Questions

- 1. Will the wells on Colbath Road be tested? We feel (for our peace of mind) that the wells should be tested for PFC's at no cost to the homeowner or at a significantly reduced cost.**

MDEQ: MDEQ took a sample of a well on Colbath Road on April 13, 2016. The results from the sample showed PFCs have entered that well. However, groundwater does not move in that direction, suggesting the PFCs are from another source and are *not* from the former WAFB. MDEQ will investigate this area further to determine where the PFCs came from.

MDHHS: The total amount of PFCs in the tested well on Colbath Road did not exceed the Health Advisory level. Because the amount of PFCs were lower than the Health Advisory level, and the PFCs are not from the former WAFB, MDHHS is *not* recommending that the well owner find an alternate water supply. MDHHS will update drinking water advice if new information leads to different conclusions.

- 2. What about wells that have been put in since the original plume was detected? At the time, some of the wells were set at different depths than when the original problem was detected. Will these be reconsidered for testing?**

MDEQ: The Air Force and MDEQ staff are in the midst of sampling all wells that are thought to be near the known contamination coming from the base. That will continue until all residential wells in those areas are sampled and tested. Originally that included sampling the homes on the west side of Van Etten Lake and Van Etten Creek, and north of the Au Sable River. It is MDEQ's and the Air Force's intent to test all the residential wells east of the base in the area described above.

Since that time of that decision by the MDEQ and the Air Force, MDEQ sampling has detected PFC contamination on the east side of Van Etten Lake, the east side of Van Etten Creek, north of the base on Colbath Road and near the Oscoda Area High School along East River Road. MDEQ is expanding its sampling of residential wells in these areas to evaluate the extent of exposure to residents by these chemicals. Information on MDEQ's findings in these areas will be provided to home owners as soon as possible after MDEQ, MDHHS, and Local Health Department # 2 have received them.

- 3. What is the depth and width of this new plume?**

MDEQ: There are many plumes up to 60 feet below the land surface. The Air Force is investigating the extent of possible PFC contamination from the plumes and will report its findings as soon as possible. Most of the groundwater under the former base and the groundwater that flows from the base to Van Etten Lake, Van Etten Creek and the Au Sable River is impacted with these chemicals. Most of the usable aquifer down to 60 feet below the land surface is impacted or could become impacted.

4. Does it reach the surface water?

MDEQ: The PFC plumes from the former base discharge to surface waters around the base. All surface waters directly to the south and directly to the east of the former base that have been sampled have PFCs in them. Some of the PFCs are there because PFCs are found in the environment world-wide, while the rest of the PFCs likely came from the contaminated groundwater at the base.

Most of the time, the groundwater from which homeowners draw their drinking water flows into the Van Etten Lake and out to Lake Huron, where it is diluted in the vast volume of water there. It is possible that Van Etten Lake water recharges (re-enters) groundwater near the lake when the dam raises the lake level. MDEQ is investigating this possibility.

5. Is the water considered safe to drink/bathe/cook in/with? What are the exact restrictions?

DHD2: For properties affected by the Health Advisory as identified by MDEQ, an alternate water supply is advised for drinking and food preparation. Specific effects of and questions related to PFCs should be directed to the MDHHS Toxicologist.

MDHHS: The main way PFCs impact human health is by swallowing them. For the properties affected by the Health Advisory, we recommended you do not use your well water for drinking, cooking, making baby formula or food, or washing fruits and vegetables.

PFCs do not easily absorb into the skin. It is safe to bathe, as well as doing your laundry and household cleaning. It is also safe to swim in and use Van Etten Lake recreationally. Getting water with PFCs on your skin will not harm you.

For more information, see the MDHHS fact sheet, [Perfluorinated Chemicals \(PFCs\) in Drinking Water Wells Near the Former Wurtsmith Air Force Base](http://www.michigan.gov/envirohealth) at <http://www.michigan.gov/envirohealth> under “In the Community”, then “Health Assessments and Related Documents” and scroll down to “Former Wurtsmith Air Force Base”. As we learn more about PFCs, we will update the advice and MDHHS fact sheets.

6. If it is deemed the drinking water is unsafe, and the homes need to be hooked up to municipal water, who will absorb that cost? Township/Air Force/Homeowner/Special Assessment?

Oscoda Township: At this time, the availability and source of funding is undetermined. However, Township representatives are soliciting cost estimates, and because of the Township’s non-involvement in the creation of this problem, it will be seeking funding assistance from the responsible parties.

AF: If any wells are identified with PFCs above the HA or future drinking water standards, the Air Force will immediately provide bottled water and work with the homeowner to implement an alternate water source.

Lake/Property Related Questions

- 1. What about the underground streams that flow into Van Etten Lake, will those springs/streams be tested?**

MDEQ: All areas of groundwater and surface water potentially affected by the former WAFB will eventually be tested for PFCs. Further, the site geology and groundwater movement is being investigated in order to understand where PFCs are moving, where they are coming from and where they are likely to move to.

- 2. Once the contamination reaches Van Etten Lake, how long does it take to reach Lake Huron?**

MDHHS: The Pine River-Van Etten Lake Watershed Coalition was formed in 1999 to address water quality concerns (algal blooms, invasive species, loss of shoreline vegetation, excess sedimentation) and prepares management plans to address those concerns. In their 2008 management plan, they stated that Van Etten Lake flushes its total volume about eight times a year or every 45 days. For more information about the watershed, contact Huron Pines at info@huronpines.org or (989) 448-2293.

- 3. We are concerned about our property value, even if we are not in the so called 'affected' area. Public knowledge of this program is bound to reduce the value of the homes on the lake.**

All Agencies: This is often a concern of property owners when a contamination issue is discovered in or near their area. We apologize for the stress this can cause. Please see Oscoda Township's reply to question 5, found below.

- 4. Will the property taxes be adjusted for lakefront homes if the lake is deemed not safe to fish and/or for water activities?**

MDHHS: MDHHS has made *no* recommendations for restricted use of Van Etten Lake. The PFC issue has not caused fish consumption guidelines for the lake. It is safe to use the lake for swimming and other recreation. PFCs do not easily absorb into the skin.

- 5. Regarding the 2015 tax assessment, the home values decreased slightly while overall home values are on the rise. Is this related to this situation?**

Oscoda Township: We are reluctant to speculate on property values as they are generally market driven. That being said, the 2015 assessments were based on market trends from sales that occurred between October of 2012 and September of 2014. Based on this 2-year sales study, the overall 2015 assessed values for home in Oscoda Township decreased slightly. The current "issue" had not yet emerged and therefore would not have affected real estate sales values.

- 6. What are the effects of the leakage into Van Etten Lake? It hasn't been included in the "do not eat" fish advisory, however, the PFC's are leaking directly into the Lake.**

MDHHS: The "Eat Safe Fish" guidelines for Van Etten Lake are based on the chemicals PCBs and mercury, not PFCs. Fish (pumpkinseed, rock bass, walleye, and white sucker) were collected from Van Etten Lake and tested for PFCs. These fish samples contained low levels of PFCs. For information about other chemicals in fish, check question 13 in the Lake/Property Related Section.

- 7. What about homes on the lake that don't have septic fields or have failed fields? Will this be addressed? Many of these homes were originally setup with fields to accommodate seasonal use and many people have now moved permanently to these locations.**

DHD2: Complaints regarding failed individual septic systems can be made to District Health Department No. 2 and will be addressed as they are received.

- 8. How are the homes/wells on the opposite side of the lake on Loud Drive affected?**

MDEQ: Since the March 2016 meeting, MDEQ has sampled several residential wells on Loud Drive along the east side of Van Etten Lake. So far, the homes on the north east side of the lake have shown no evidence of PFC contamination from firefighting foams. However, two wells at the south end of Loud Drive did show PCE contamination from degreasing fluids and PFCs. The PFC levels were low, but the findings indicate there is a plume in the area. In response to this new finding, MDEQ, in cooperation with District Health Department #2, sampled residential wells both north and south of the impacted wells. We are waiting for results as of June 10, 2016. Staff also sampled several wells along Loud Drive across the lake from the base where more contaminated plumes from the base have been shown to have reached Van Etten Lake. MDEQ, in cooperation with DHD2, will continue sampling in the area as long as there is evidence of contamination in the area. The goal is to ensure that residents have safe drinking water.

- 9. How long will the correction take?**

MDEQ: Efforts to reduce human and environmental exposures have already begun and will continue to be the focus of the different agencies. It is impossible to estimate how long it will take to reduce or eliminate the PFC contamination from the former base and surrounding areas.

- 10. What about plant life in the water? Will this be affected by the PFC's?**

MDHHS: It is not known if PFCs will affect aquatic plants, whether it will harm them or enhance their growth.

11. Do these plants hold the contaminants? If so, how long?

MDHHS: The Minnesota Department of Health conducted studies where people's gardens were watered with PFC-contaminated water. In some cases, the soil also had PFCs in it. The results suggested the plants did not absorb PFCs very well and did *not* contain amounts of PFCs that could harm public health.

12. What additional contaminants (other than the known PFC plume) have been found in Van Etten Lake and what is the cause of these contaminants? Are these also being addressed?

MDHHS: Catfish from Van Etten Lake were tested in 1990 and had PCBs in them. MDHHS's "Eat Safe Fish" guideline for catfish in Van Etten Lake recommends Limited servings, 1-2 per year, except for sensitive populations who shouldn't eat any catfish from the lake. Sensitive populations include pregnant or breastfeeding women, children, people of reproductive age, and those with a chronic illness such as cancer or diabetes.

Catfish from the lake have not been tested for PCBs since then, but walleye and white sucker from the lake were tested in 2010 and showed very low levels of PCBs. The source of the PCBs is not known.

Several fish species from the lake have been tested for mercury. Walleye and white sucker have Eat Safe Fish guidelines because of the mercury levels in them. Mercury is a world-wide contaminant and is found in all of Michigan's lakes.

For fish species from Van Etten Lake that have not been tested, refer to the Statewide Safe Fish Guidelines for Eat Safe Fish advice. The Statewide Safe Fish Guidelines can be found at <http://www.michigan.gov/eatsafefish> under the "Going Fishing" button.

13. Right now, are the non-migratory and migratory fish safe to eat? If not, how long before they will be?

MDHHS: Migratory fish cannot enter Van Etten Lake. Some non-migratory fish have been tested from Van Etten Lake. There are no PFC-related guidelines for these fish, however, there are guidelines for mercury and PCBs.

MDHHS recommends that no one eat the non-migratory fish (fish that live in the river year round) caught in the lower Au Sable River. This advice will remain in place until the PFC contamination has been controlled and levels in the fish start to decrease. This may take many years.

Follow the Lake Huron guidelines for migratory fish entering the lower Au Sable River from the lake. There are no PFC-related guidelines for the migratory fish.

The [Eat Safe Fish Guidelines for Iosco County](http://www.michigan.gov/eatsafefish) can be found at <http://www.michigan.gov/eatsafefish> under the "Going Fishing" button.

14. Does this also affect the ducks and geese that live at the lake?

MDHHS: No area waterfowl or game has been tested. Waterfowl using Van Etten Lake exclusively are not likely to have chemicals in them in the amounts that MDHHS would expect to see in waterfowl using only Clark's Marsh. Fish-eating waterfowl would be expected to higher amounts of chemicals in them. The Michigan Department of Natural Resources (MDNR) may have more information.

15. Are the deer and turkey that drink from the lake or streams affected?

MDHHS: Wildlife and game whose territory centers around the Clark's Marsh ponds may be affected based on sampling data for tree swallows nesting next to the ponds and muskrats trapped from the ponds. MDNR may have more information.

16. Are there hunting restrictions on these birds/deer/turkey for the upcoming hunting season?

MDHHS: No area waterfowl, deer, or turkeys have been tested. MDNR is responsible for hunting regulations.

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