

IMPROVING INTERAGENCY AND INTERGOVERNMENTAL COORDINATION ON PFAS FOR MICHIGAN COMMUNITIES BEFORE THE U.S. SENATE COMMITTEE ON HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS

CRAIG L. MINOR, TESTIMONY 8.1.2022 (5-Minute; 700 words)

We are here because we know PFAS is harmful to people. In fact, people are the number one reason we care about PFAS at all. We want our ground and surface water cleaned up because we do not want people to drink, eat, touch, or breath this poison. The priority is clear, people. No agency or person would support a one-sided PFAS strategy that states or implies "we ignore past harms and only focus on preventing future harms."

My testimony today is to highlight a significant past harm, which requires your immediate leadership. From 1982-1997, Wurtsmith AFB citizens drank egregious amounts of PFAS in the tap water; daily and for 10-years!

Beginning in 1982, Wurtsmith firefighters began to routinely dispose of PFAS-ladened AFFF along the grassy edge of the operational apron near the fire station. This AFFF dump site was only 500-yards upstream in the aquifer from the main drinking water wells. **Dumping AFFF on the ground was never an approved disposal practice.** A 1982 3M 'Product Environmental Data Sheet' clearly states: "DISPOSAL OF PRODUCT: Bleed to a wastewater treatment system in accordance with local regulations." Because of the known toxicity of AFFF, Air Force and Navy research documents from this period stated the same. Had excess firefighter foam been disposed of in a wastewater treatment facility and not dumped on the ground, I would not be testifying in front you today.

When Wurtsmith military operations ended in 1993, base officials labeled the operational apron AFFF dump site SS-60. According to Air Force documents, the practice of dumping AFFF at site SS-60 ended in 1992. **For 10-years, from 1982 to 1992, AFFF with PFAS was dumped directly on the ground, entered the groundwater, and was drawn into the main water wells supplying all Wurtsmith's potable water via the water tower.** After 1992 and until 1997, smaller amounts of PFAS-ladened water continued to enter the base water-system from the PFAS saturated aquifer. In 1997, a local municipal water-system replaced the Wurtsmith wells.

The amount of PFAS entering the water wells was not trivial. The Michigan Department of Environmental Quality (MDEQ) would discover, ~25-years later, that PFAS concentrations in

the groundwater at site SS-60 were over 43,000 parts-per-trillion (ppt). Further, MDEQ measured high PFAS concentration from SS-60, stretching to the historical water wells. The MDEQ also discovered trapped water in twenty-two abandoned fire hydrants, a hot water heater, and water softener from when Wurtsmith was active. As expected, all the trapped water contained various concentrations of PFAS. The highest concentration measured was 7,500 ppt.

My wife (Carrie) and I worked and lived on base from 1985 to 1990. In October 1989, our son Mitchell was born at Wurtsmith with severe cerebral palsy and microcephaly, and he passed 30-years later, 2-weeks after filming his story in the 'No Defense' documentary. In 1989, I was hospitalized on base for an unidentifiable prostate issue. In addition, I had a large tumor removed from my back. Two years after our profoundly handicapped son was born, Carrie miscarried our next child. We did not discover PFAS was in the Wurtsmith water until 2019; 2-weeks after God prompted us to write "OVERWHELMED: A Civilian Casualty of Cold War Poison." Go to mitchellsmemoir.com to learn more. In 2019 my overall blood PFAS levels were 3.5 times higher than the national average and my perfluorohexane sulfonate (PFHxS) levels, a signature component of AFFF, was nearly 20 times higher than national exposure levels. Today, my liver and spleen are enlarged, and my kidneys are low functioning, and this is just the beginning of the list. I have met another veteran with the similar blood results and health issues.

It is now 40-years since Wurtsmith citizens began drinking PFAS from AFFF in egregious amounts and it is time for local, state, and federal leadership to officially recognize this event. To start, governments and applicable agencies need to cut through the red tape and add this poisoning event to the 'VA Presumptive List' until Congress can organize a more comprehensive solution to care for all the US citizens poisoned. The DoD should be the loudest voice, taking lead to triage its cold war battlefield casualties. Why DoD? Because we leave no one behind!

Drinking PFAS From AFFF at The Former Wurtsmith AFB

Craig L. Minor 5.27.2022

EXECUTIVE SUMMARY

In 1970, the US Air Force began using Aqueous Film Forming Foam (AFFF), which contains toxic perfluoroalkyl substances (PFAS). Firefighters routinely trained to extinguish jet-fuel fires at a designated fire pit at the west edge of the Wurtsmith Air Force Base (Wurtsmith) runway. Beginning in 1982, Wurtsmith firefighters routinely disposed of AFFF off the operational apron, which was located east of the runway near the fire station. When Wurtsmith military operations ended in 1993, this AFFF disposal site was labeled SS-60 by Air Force officials transitioning Wurtsmith to civilian use. The practice of dumping AFFF at SS-60 ended in 1992. From 1982 to 1992, the wells supplying the majority of Wurtsmith's potable water, directly downstream in the aquifer, contained large amounts of PFAS from AFFF. After 1992 and until 1997, smaller amounts of PFAS-laden water continued to enter the base water-system from the PFAS saturated aquifer. In 1997, the Wurtsmith well-system was replaced by a local municipal water-system, sourcing fresh water about a mile off the shores of Lake Huron.

The Michigan Department of Environmental Quality (MDEQ) confirmed the toxicity of the PFAS from AFFF in the SS-60 site groundwater about 25-years later. Wells monitored nearby recorded concentrations as high as ~43,000 parts-per-trillion (ppt). MDEQ also measured high concentrations of PFAS, originating from SS-60, forming two groundwater plumes passing directly through the historical main water-wells, heading towards Van Etan Lake. The contaminated water from these wells entered the water tower and was used and consumed by base residents and workers. Soiled water was sent to the Wurtsmith waste-water treatment plant resulting in high PFAS concentrations in Clark's Marsh from the plant's waste discharge. In addition, MDEQ discovered trapped water in twenty-two abandoned fire hydrants, a hot water heater, and water softener from when Wurtsmith was active. As expected, all the trapped water contained various concentrations of PFAS (highest was 7,500 ppt), proving PFAS contaminated water was sent to residential and operations buildings from the water tower.

From 1982 though 1997, veterans, civilians, children, guests, and pregnant mothers unknowingly consumed PFAS in large quantities as they worked and lived at Wurtsmith. Roughly 25-years later, the PFAS levels in the blood of two veterans stationed at Wurtsmith between 1982 and 1992, still show PFAS concentrations 3.5 times higher than national

exposure levels. Further, perfluorohexane sulfonate (PFHxS), a signature component of AFFF, was nearly 20 times higher than national exposure levels. In the 15-years PFAS was in the Wurtsmith well-water system, the transient Wurtsmith community drank high concentrations of PFAS from AFFF! What follows is a detail account of the main wells impacted by the SS-60 AFFF disposal site.

BACKGROUND

The "front lines" of the Cold War were not in Russia, but instead on military bases like Wurtsmith; a seven square-mile patch of land adjacent to the quiet beach community of Oscoda, Michigan. Oscoda is on the east side of the state, only 194 roadway miles north of Detroit. Van Eattan Lake forms the north-east border of the former base. To the south and through Clark's Marsh and Tuckers Swamp is the Ausable River. Less than a mile to the west and through the middle of Oscoda Township, is the Great Lake Huron. Connecting all the surface waterways is the underground aquifer; a distinct 65-foot-deep mixture of water, dirt, sand, and stone beginning roughly 15-feet below the surface. At the bottom of the aquifer is a thick bed of impermeable clay.

The federal government began using Oscoda's land in the 1920s. As our nation's air power emerged, a small Army Air Field emerged. Ten months after the end of World War II, this Army Air Field became Oscoda Air Force Base as the newly minted Air Force began to form. No one knew at the time a cold war would begin and last 44 years (1947-1991). As the allied battle-lines in Europe and the Pacific made victorious retreats, new battle lines slowly emerged across the deep rural communities of the United States. These new encampments grew in stature and responsibility as nuclear deterrence took shape, embodying phrases like "Peace through Strength" and "Mutual Assured Destruction." The new threat was communist expansionism and the Cold War was in full swing when Oscoda Air Force Base was renamed Wurtsmith Air Force Base on February 15, 1953. Wurtsmith's Strategic Air Command (SAC) Cold War mission would last 38-year. Make no mistake, towns like Oscoda were the frontline of the Cold War, where the Atlantic Ocean became a neutral zone in a high stakes stand-off for global influence.

This was the backdrop in 1970 when a firefighter foam called Light Water was deployed on military installations across the United States. This firefighter foam, also known as Aqueous Film Forming Foam (AFFF), was already in-use on warships and Navy coastal installations roughly five years earlier. The name of the AFFF itself, designed in the research laboratories of

the United States Navy and manufactured in the beginning by the 3M Company for the Department of Defense, engenders trust, as if made from something familiar and safe. However, the active ingredient of Light Water, a fluorinated substance, is neither safe nor familiar. Fluorinated substances have properties of a neurotoxin and are dubbed the 'forever chemical.' A nickname that foretells its durability and lasting impact on society. Light Water would be spilled and sprayed atop the Wurtsmith ground and then seep into the soil in egregious amounts as firefighters doused petroleum fires in a training pit and when they routinely calibrated and cleaned their dispensing equipment. Time and distance calibrations of the spraying equipment likely dispensed more AFFF onto the ground than any used in training. In addition to training, calibration, and cleaning, the AFFF was also dispensed on petroleum fires during real emergencies.

WURTSMITH BEGINS USING AFFF

The approved Department of Defense AFFF was acquired from the companies like 3M, National Foam, and Tyco/Ansul. The 3M Company was the DOD's sole supplier of AFFF from roughly 1967 to 1973. After 1973 and until Wurtsmith officially closed, June 30, 1993, any three of the approved chemical manufactures could have provided the AFFF found in the former Wurtsmith Air Force Base aquifer today. The practice of disposing of fire-fighter foam on the ground at Wurtsmith ended in 1992 after the Michigan Department of Natural Resources (MDNR) informed the base that butyl carbitol, making up roughly 20% of the AFFF mixture, was a pollutant. Butyl Carbitol is not widely known, but is toxic to humans.ⁱ Although butyl carbitol breaks down in the environment, it is highly likely butyl carbitol reached the water faucets on base in harmful amounts given the proximity of the wells to the AFFF disposal site. This is another untold story of toxic chemicals contaminating the Wurtsmith population.

The active ingredient in AFFF is perfluorooctane sulfonate (PFOS). The AFFF was sold containing 3% or 6% of fluorinated substances. Although PFOS was the desired chemical in the AFFF mixture, only 70% of the fluorinated substances created for the AFFF mixture were actually PFOS. The other 30% were similar fluorinated substances like perfluorooctanoate (PFOA), perfluorohexane sulfonate (PFHxS), and the like. To avoid confusion, PFAS is sometimes referred to as perfluorochemicals (PFC), which is a general term encompassing over 4000+ fluorinated substances.

Studies record that no samples remain of the AFFF manufactured prior to 1989. In addition, the composition of fluorinated substances in AFFF was different from year-to-year. This is because the electrochemical fluorination (ECF) process used to synthesize PFOS, the

active ingredient in AFFF, was not pure. Also, some of the larger fluorinated substances released in the aquifer, broke apart to make different and smaller fluorinated substances. Knowing the exact fluorinated substances entering the aquifer is not as important as understanding the amount and types of PFAS in the aquifer, which is known to cause harm to humans, animals, and plant life.

What is quantifiable in the groundwater today is a slow-fading snapshot of a roughly 30-year Cold-War practice of releasing AFFF into the Wurtsmith environment. Further, the same contamination footprints show where persons living and working on Wurtsmith came in direct contact with PFAS and other AFFF constituents. Although the handling and touching of PFAS is not safe, the most egregious and dangerous contact is ingesting PFAS-contaminated water. Let it be known, every person working and living on Wurtsmith from 1982 through 1997 either drank, cooked, cleaned, and/or showered with egregious and dangerous amounts of PFAS-contaminated water from the base water tower. What follows is how PFAS found its way into Wurtsmith's potable water source, forever changing the lives of an untold number of men, women, and children serving and supporting our great nation.

PFAS FROM AFFF IN THE WURTSMITH WATER TOWER: 1982-1997

Shortly after Wurtsmith military operations ended in 1993, a "Final Environmental Impact Statement" report listed the Installation Restoration Program (IRP) site SS-60 as a prominent AFFF disposal site. From 1982ⁱⁱ until 1992, site SS-60 is where firefighters routinely disposed of AFFF along a grassy edge of the operational apron; close to the fire station.ⁱⁱⁱ Site SS-60 was directly upstream in the aquifer and near the main wells supplying water to the entire base.^{iv} In 2016, PFAS concentrations as high as 42,962 ppt were measured from a nearby monitoring well.^v Because the PFAS-laden AFFF was drawn into the wells, the Wurtsmith waste-water treatment plant received egregious and dangerous amounts of PFAS. PFAS entering the waste-water treatment plant was ultimately discharged into Clark's Marsh, which contains some of the highest concentrations of PFAS and is further evidence of how PFAS was present in the Wurtsmith main water-system. In 2017, the Michigan Department of Environmental Quality (MDEQ) (known today as the Department of Environment, Great Lakes and Energy, or EGLE) presented their findings concerning past base personnel exposure to PFAS in a report titled "PFC Concentrations in Water Retained within Fire Hydrants at Former Wurtsmith AFB (WAFB)." Twenty-two abandoned fire hydrants, a hot water heater, and water softener, from when Wurtsmith was militarily active, still contained PFAS as high as 7,500 ppt^{vi} The PFAS trapped in the fire hydrants and old equipment, likely reflects PFAS concentrations after the

practice of dumping AFFF on the ground ended in 1992. PFAS concentrations in the well-water supply was likely at its greatest from 1982 to 1992. Finally, PFAS levels in the blood of two Air-Force veterans from Wurtsmith show PFAS levels well above national exposure levels. Next is a survey of the wells drawing in large quantities of PFAS from AFFF. See Table-1.

Table 1: Summary of Wurtsmith Wells Drawing in PFAS from AFFF^{vii}[illegible]

From 1942 through 1985 some or all of the wells AF1, AF2, AF3, AF4, AF18, and AF19, provided the potable water to base citizens. Wells AF1, AF2, and AF3 formed one collocated group. Wells AF4 and AF5 formed a second group. Wells AF18 and AF19 formed a third group near the water tower. The Michigan Department of Environmental Quality (MDEQ) in 2011 and as published in 2017, records the concentrations of PFAS in the aquifer around each well. See Figure-1 below. Undoubtedly, high concentrations of PFAS were drawn into main supply wells AF2, AF4, and AF 5. Lessor PFAS amounts were also present in wells AF18 and AF19. In all instances, PFAS was transported from the aquifer to the water tower and distributed base wide.

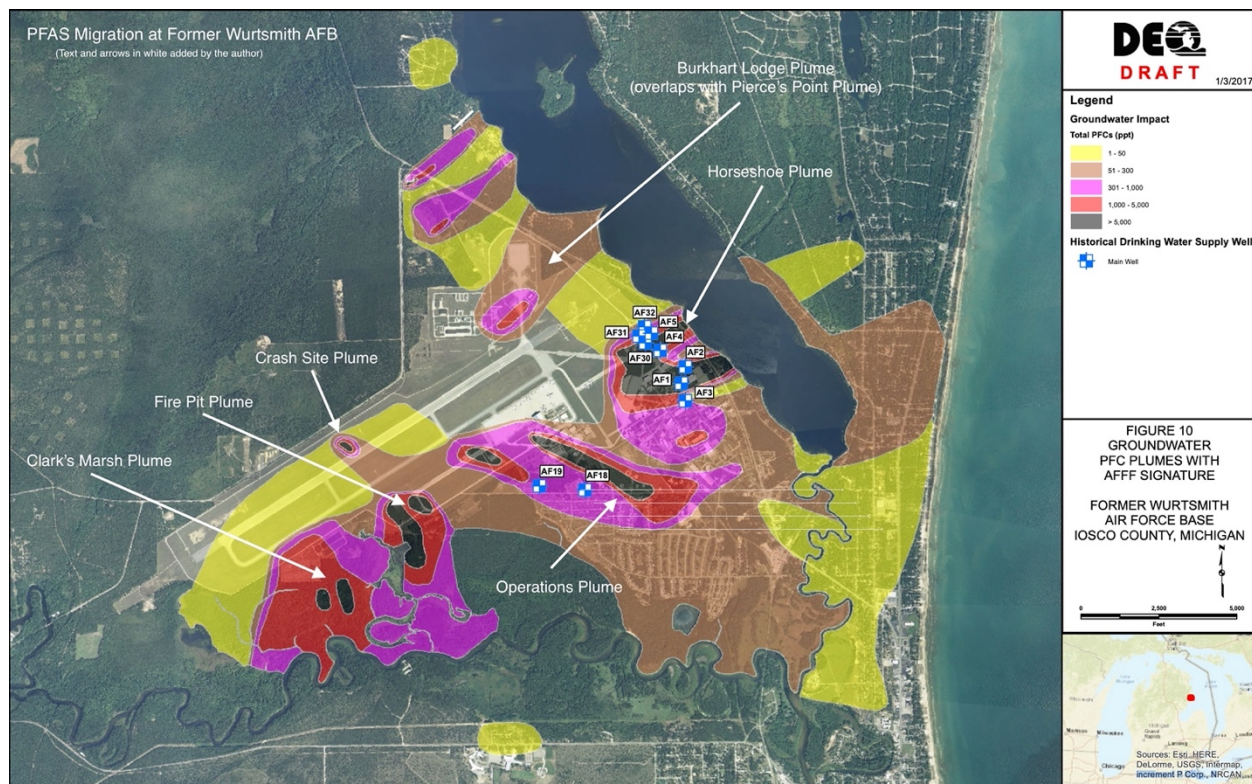


Figure 1: MDEQ "PFAS Migration at Former Wurtsmith AFB" January 3, 2017^{viii}

In March and April of 1985, Wurtsmith replaced the main water supply with wells AF30, AF31, and AF32.^{ix} The location of the three new wells was bundled near wells AF4 and AF5. The three new wells supplied the majority of the Wurtsmith potable water until military operations officially ended in 1993. When the three new wells came on line, wells AF2, AF4, AF5, and AF19 became a supplemental water source during peak demand. The drilling of the new wells, put in service in 1985, was in direct response to volatile chemical contaminations of the base wide water supply system from engine degreaser and jet fuel. The volatile chemical contamination was first discovered in 1977; base residents complained of bad tasting water.^x The volatile chemical contamination grew in scope and would eventually require abandoning several of the original wells. It is important to note that Wurtsmith is an Environmental Protection Agency (EPA) Superfund Site for volatile chemical contaminations and **NOT** PFAS contamination from AFFF.

The decision to place additional wells downstream and near a known AFFF disposal site in 1985, is unfathomable. Especially, on the heels of a major United States Geological Survey (USGS) study from 1979 through 1985, detailing how volatile chemical spills transit the

Wurtsmith aquifer. Both the 1983 and 1986 "Ground-Water Contamination at Wurtsmith Air Force Base, Michigan" reports left no doubt as to how chemicals moved about in the groundwater. Wurtsmith officials knew or should have known that AFFF was reaching the potable water sources for the entire base. At no time in the past would any base official have consumed AFFF, in any concentration, before it was disposed of on the ground.

CONCLUSION

Data shows extremely high PFAS concentrations: (i) in the aquifer at the AFFF disposal site; (ii) around the historical main wells supplying the base potable water; (iii) in old fire hydrants and other equipment attached to the main water system when the base was operational; (iv) in the waste water treatment plant discharge at Clark's Marsh; and (v) in veterans 3.5 times higher than the national average. Because PFAS is odorless, colorless, and tasteless, unsuspecting Wurtsmith men, women, children, and the unborn drank, cooked, and showered in egregious and dangerous amounts of PFAS-contaminated water from 1982 through 1997. It's time to stand up for those exposed, harmed, and in some cases, killed by PFAS in AFFF at Wurtsmith!

ⁱ "Environmental Aspects of AFFF and AR-AFFF, ANSUL Incorporated, Marinette, WI 54143-2542", White Paper 1017, 2003

ⁱⁱ "Public Health Assessment, Wurtsmith Air Force Base, Oscoda, Iosco County, Michigan EPA Facility ID: MI5570024278, April 30, 2001, page A-30

ⁱⁱⁱ "Final Environmental Impact Statement September 1993; Disposal and Reuse of Wurtsmith Air Force Base, Michigan", Table 3.3-2. 'IRP Site Descriptions and Locations Page 5 of 6'; page 3-50

^{iv} Authors Note: After 1977/1978, wells AF2, AF4, and AF5 became the main water source. Wells AF1, AF3, AF18, and AF19 were closed due to volatile chemical contamination

^v "MDEQ PFC Concentrations in Water Retained within Fire Hydrants at Former Wurtsmith Air Force Base (WAFB)", January 3, 2017, Table-1 Select Groundwater PFC Results, Sample VAS15004-17-20

^{vi} "MDEQ PFC Concentrations in Water Retained within Fire Hydrants at Former Wurtsmith Air Force Base (WAFB)", January 3, 2017; page 16

^{vii} "Health Consultation, Public Comment Version, Re-evaluation of Past Exposures to VOC Contaminates in Drinking Water", July 27, 2018, 'Appendix D: Updated Public Health Conclusions for Individual Wells', pages 57-115

^{viii} "MDEQ PFC Concentrations in Water Retained within Fire Hydrants at Former Wurtsmith Air Force Base (WAFB)", January 3, 2017; 'Figure 10 Groundwater PFC Plumes With AFFF Signature (includes authors noted in white text)'

^{ix} "Assessment of Ground-Water Contamination at Wurtsmith Air Force Base, Michigan, 1982-1985" 1986; page 83

^x "Ground-Water Contamination at Wurtsmith Air Force Base, Michigan, U.S. Geological Survey 1979-1981 Study", 1983, page 5