



# PFAS Contamination at the Former Wurtsmith Air Force Base: The True Story

**Setting the record straight** about what the Air Force, the Department of Defense, and the state of Michigan have actually done (or not done) to protect people and natural resources in Oscoda (1974-2021)



# Introduction

The U.S. military's heavy and long-standing use of aqueous film forming foam ("AFFF") has contributed to one of the worst environmental crises of our time. For over fifty years, the U.S. military has used AFFF containing high concentrations of toxic chemicals called per- and polyfluoroalkyl substances ("PFASs"). PFASs are a family of chemicals that are extraordinarily toxic and persistent in the environment. They have been linked to cancer, kidney disease, and numerous birth and developmental disorders. Also known as "forever chemicals," PFASs are widespread in the environment because they take decades to break down, and many tend to bioaccumulate in people, fish, and wildlife. Moreover, PFASs are exceptionally numerous—there are thousands of individual PFAS compounds—and their durability and resistance to water, oils, and heat make them ubiquitous in both commercial and industrial settings.

Scientists first discovered toxic PFAS contamination at the former Wurtsmith Air Force base in Oscoda, Michigan, over two decades ago.<sup>1</sup> From the 1970s until at least the base's closure in 1993, the Air Force sprayed PFAS-laden AFFF at Wurtsmith during training exercises to extinguish fires, and regularly disposed of spent AFFF in grassy areas of the base.<sup>2</sup> It should come as no surprise that these activities caused massive groundwater contamination—contamination that is running largely unchecked through the Oscoda area due to the Air Force's failure to control and clean up the PFAS plumes from the base.

The Air Force has known about the toxic nature of PFASs since the 1970s.<sup>3</sup> Despite this knowledge, the Air Force has been extremely slow to address the devastating effects of its historic discharges of AFFF at Wurtsmith. When it has responded, the Air Force has taken inadequate actions that have only worsened the public health crisis in Oscoda. Adding insult to injury, the Air Force has repeatedly attempted to assure Wurtsmith veterans and Oscoda residents that it takes their health and its own cleanup responsibility seriously. In doing so, the Air Force has hidden behind lax federal guidelines<sup>4</sup> and denied its need to comply with Michigan's stricter standards.<sup>5</sup>

The state of Michigan's actions have also been deficient. Although the state has played a significant role in uncovering the extent of PFAS contamination at Wurtsmith, it has frequently been slow, opaque, and ineffective in warning Michiganders of the dangers of exposure to PFAS contamination from Wurtsmith. Furthermore, because its attempts to push back on the Air Force's positions have been weak or unavailing, the state has generally failed to use the strict PFAS cleanup standards that it developed over the past few years to its advantage.

Despite their dubious track records protecting public health in Oscoda, both the Air Force and the state of Michigan have often defended and even praised their own actions, even when those actions have resulted in delays and missteps. This document aims to set the record straight regarding what the Air Force and the state have actually done—and failed to do—about the rampant PFAS contamination in Oscoda.



Photo credit: Michigan Department of Environmental Quality



In this June 6, 2018 photo, residents demand answers and solutions outside of Robert J. Parks Library, in a rally for safe water before a Restoration Advisory Board meeting in Oscoda, Mich. These residents are asking the Air Force to claim responsibility for damages after findings of high levels of the toxic chemical PFOS in the foam near a plume coming from the former nuclear bomber base. PFAS foam continues to rise up on the shoreline of Van Etten Lake almost daily, and residents are demanding answers and solutions.

Photo credit: Jake May/The Flint Journal via AP

# The Air Force and the Department of Defense

The Air Force, and the Department of Defense more generally, have known for decades about the toxicity of PFASs, and about its heavy use of AFFF at military bases, including Wurtsmith. Yet instead of claiming accountability for their releases of PFASs into the environment, the Department of Defense and the Air Force have adopted a strategy of avoidance, using tactics such as delay and deflection in an attempt to limit their liability for the large-scale environmental havoc they have wreaked. At Wurtsmith in particular, the Air Force has routinely attempted to dodge responsibility for cleaning up PFAS contamination: it has frequently delayed necessary actions and made promises regarding cleanup upon which they later went back on their word. And when the agency has taken action, those actions have been inconsistent with the known dangers of PFASs and the pervasive contamination emanating from Wurtsmith.



Photo credit: iStockPhoto/kzenon

## Actions Inconsistent with the Known Severity of the Problem

**1970s–80s: Numerous Air Force reports indicated that PFAS are highly toxic.<sup>6</sup>**

### WHAT SHOULD HAVE HAPPENED

- The Department of Defense and Air Force should have been cautious with their use of AFFF in light of growing amounts of concerning data.

### WHAT REALLY HAPPENED

- Neither the Department of Defense nor the Air Force warned service members or the public about the possible dangers of use of and exposure to PFAS via AFFF, and continued to use AFFF heavily.

**Nov. 1999: Academic research, eventually published in a scientific journal with the help of federal funding, demonstrated that PFAS were present in groundwater at Wurtsmith.<sup>7</sup>**

### WHAT SHOULD HAVE HAPPENED

- Upon receiving this troubling information, the Air Force should have initiated an investigation of PFAS contamination at Wurtsmith.

### WHAT REALLY HAPPENED

- The Air Force failed to investigate any further until such inaction became untenable when the state of Michigan discovered PFAS contamination at Wurtsmith over a decade later.

**Jun. 2009: Based on the Air Force’s historic use of AFFF, EGLE (known as MDEQ until early 2019<sup>8</sup>) recommended that the Air Force sample for PFOS and PFOA at Wurtsmith.<sup>9</sup>**

### WHAT SHOULD HAVE HAPPENED

- The Air Force should have followed EGLE’s advice and acted immediately.

### WHAT REALLY HAPPENED

- The Air Force ignored EGLE’s advice, delaying confirmation that Wurtsmith had PFAS contamination until April 2010, when EGLE discovered PFASs in the soil at the base.<sup>10</sup> Further sampling that year by EGLE showed PFAS contamination throughout the entire base.<sup>11</sup>

**Mar. 2011: The Department of Defense released a Chemical and Material Emerging Risk Alert for AFFF, warning of the “human health and environmental risks” associated with PFOS and PFOA.<sup>12</sup>**

### WHAT SHOULD HAVE HAPPENED

- The Air Force should have quickly initiated a sitewide investigation of PFAS contamination at Wurtsmith, in light of its widespread use of AFFF at the former base.

### WHAT REALLY HAPPENED

- The Air Force did not take immediate action, waiting until 2013 to analyze its own groundwater samples.<sup>13</sup>

**Apr. 2015: The Air Force installed a single pump-and-treat system at Wurtsmith and later claimed that it was successfully intercepting PFAS-contaminated groundwater from Fire Training Area #2 before the groundwater reached surface water.<sup>14</sup>**

## Actions Inconsistent with the Known Severity of the Problem (continued)

### WHAT SHOULD HAVE HAPPENED

- The Air Force should have installed a more robust system, and should have ensured that its system for intercepting PFAS-contaminated groundwater actually worked properly.

### WHAT REALLY HAPPENED

- Contrary to the Air Force's assertions, the system failed to intercept or contain PFAS-contaminated groundwater or to prevent expansion of the PFAS plumes migrating off the former base.<sup>15</sup>

**Dec. 2015: The Air Force began sampling private residential drinking water wells to the east and south of the base.<sup>16</sup> Several wells had water containing total PFAS concentrations above 70 ppt, but at first, only one well tested above 70 ppt combined PFOS and PFOA.<sup>17</sup>**

### WHAT SHOULD HAVE HAPPENED

- Especially considering the Air Force's knowledge of its use of AFFF at Wurtsmith, the agency should have begun sampling residential wells far earlier. It also should have provided an alternate source of drinking water to all affected private well water users, and taken action to prevent further off-base movement of PFAS-impacted groundwater.

### WHAT REALLY HAPPENED

- The Air Force refused to provide an alternate source of drinking water to all but one household, where the well water tested over 3000 ppt combined PFOS and PFOA.<sup>18</sup> Initially, the Air Force justified this refusal by stating that the sampling results were below the EPA's provisional health advisories for PFOS (200 ppt) and PFOA (400 ppt).<sup>19</sup> Later, after the EPA published a final lifetime health advisory for combined PFOS and PFOA (70 ppt), and after the state of Michigan provided alternate water supplies to affected well owners, the Air Force refused to reimburse the state for that cost, insisting that the EPA's lifetime health advisory was sufficiently protective of human health.<sup>20</sup>
- Despite the Air Force's sampling coming over five years after EGLE first found PFASs at Wurtsmith, the agency was quick to pat itself on the back for supplying bottled water to this single household "immediately" and later connecting that household to municipal water.<sup>21</sup>

**Apr. 2016: EGLE asked the Air Force to test drinking water on the base due to concern about residual PFAS contamination in the water distribution system piping.<sup>22</sup>**

### WHAT SHOULD HAVE HAPPENED

- The Air Force should have complied with EGLE's request so that the agencies could work together to better and more quickly understand the PFAS crisis in Oscoda.

### WHAT REALLY HAPPENED

- The Air Force did not perform the sampling. EGLE eventually ended up checking the system itself and found PFAS levels that were higher than the local utility that now provides water.<sup>23</sup>

**Oct. 2017: The Air Force submitted a revised site evaluation work plan, proposing to change its sampling approach and stating that it was "no longer collecting samples at private properties, i.e. along [ ] Van Etten Lake and Van Etten Creek."<sup>24</sup>**

### WHAT SHOULD HAVE HAPPENED

- At the very least, the Air Force should have maintained its sampling of threatened or tainted residential wells. Continued, frequent monitoring would have helped protect the numerous private well users in Oscoda, and would have assisted the Air Force in gathering data to delineate the plume emanating from Wurtsmith.

### WHAT REALLY HAPPENED

- Ultimately, the Air Force agreed to conduct quarterly sampling in 2018 for the 45 private water wells that it sampled in the summer of 2017, and annually for the following two years.<sup>25</sup>

**Mar. 2018: The Air Force indicated that it had "no plans to investigate areas east of [Van Etten Lake] until there is evidence PFOS/PFOA has migrated there from the base."<sup>26</sup>**

### WHAT SHOULD HAVE HAPPENED

- By this point, there were numerous water and wildlife consumption advisories in place all around the former base. Van Etten Lake itself was contaminated with PFASs.<sup>27</sup> In addition, the Air Force did not fully understand and was not adequately controlling the Wurtsmith plume. Thus, the Air Force should have proactively sought to identify and monitor all areas in Oscoda where contamination might continue to spread.

### WHAT REALLY HAPPENED

- Soon afterward, PFAS contamination was found in the groundwater on the east side of Van Etten Lake and in Lake Huron.<sup>28</sup> Then, the Air Force denied responsibility for causing that contamination.

**Jul. 2018: The Department of Defense said that it believed a combined 380 ppt was an appropriate maximum cleanup threshold for PFOS and PFOA.<sup>29</sup>**

### WHAT SHOULD HAVE HAPPENED

- 380 ppt is more than 30 times a level suggested as safe for drinking water by the federal Agency for Toxic Substances and Disease Registry, and more than 5 times the EPA's health advisory level.<sup>30</sup> If the Department of Defense took its responsibility to protect public health seriously, it would not have proposed such a high level.

## Actions Inconsistent with the Known Severity of the Problem (continued)

### WHAT REALLY HAPPENED

- The Department of Defense faces billions of dollars in remediation costs from its widespread use of AFFF, and knows that more health-protective cleanup standards (such as Michigan's) will result in higher cleanup costs.<sup>31</sup> The agency clearly prioritized its desire to limit its liability for PFAS contamination that it caused over public health.

**Dec. 2018: The state of Michigan sent a notice of violation to the Air Force resulting from the Air Force's treatment system's persistent failures to comply with Michigan's 12 ppt of PFAS water quality standard for non-drinking water sources.**<sup>32</sup>

### WHAT SHOULD HAVE HAPPENED

- The Air Force should have engaged with the state to address its discharges concerning amounts of PFASs.

### WHAT REALLY HAPPENED

- The Air Force refused to take any new actions to stem the flow of contamination entering Clark's Marsh, citing the absence of a federal hazardous substance designation.<sup>33</sup> In addition, the Air Force claimed that it did not need to comply with Michigan's 12 ppt PFOS standard,

limiting how much PFAS can enter surface water from groundwater because of the federal government's sovereign immunity from state laws.<sup>34</sup>

**Feb. 2020: The Air Force stopped sampling wells on the west side of Van Etten Lake, citing "five years of quarterly sample results that showed levels well below the EPA lifetime health advisory."**<sup>35</sup>

### WHAT SHOULD HAVE HAPPENED

- The Air Force should have continued to sample these wells, particularly given the unpredictable nature of PFAS contamination plume movement, and because testing below the EPA's lifetime health advisory is not necessarily indicative of the well water's safety.

### WHAT REALLY HAPPENED

- The Air Force has not resumed residential well sampling in this area.

**Mar. 2020: The Air Force declined to take interim actions to remove and prevent further spread of PFAS contamination while planning its remedial investigation.**<sup>36</sup>

### WHAT SHOULD HAVE HAPPENED

- After years of interacting with the community and other stakeholders, the Air Force should have understood the need to act quickly to contain and remove existing PFAS contamination in Oscoda.

### WHAT REALLY HAPPENED

- Faced with intense pressure from the community, the Air Force backtracked from its original position and agreed to perform two interim remedial actions to address PFAS contamination.<sup>37</sup>

**Apr. 2020: The Air Force said that there is no imminent human health harm because nobody in Oscoda is drinking water that is contaminated above the EPA health advisory level.**<sup>38</sup>

### WHAT SHOULD HAVE HAPPENED

- The Air Force should not have attempted to minimize the scope of the problem, because people have been and are likely still being harmed by PFAS contamination from Wurtsmith.

### WHAT REALLY HAPPENED

- For one, the EPA's lifetime health advisory level (70 ppt PFOS + PFOA) is far higher than Michigan's maximum contaminant levels ("MCLs") for PFASs in drinking water,<sup>39</sup> and is too lax to protect public health. Moreover, the Air Force's statement ignored the fact that there may be dire consequences from people's continued consumption of highly contaminated fish and wildlife at Clark's Marsh.<sup>40</sup>



Photo credit: Drew Youngedyke

## False Promises

**Mar. 2017: The Air Force assured the Michigan state Senate that it was working to comply with the state's surface water quality criteria ("Rule 57") for groundwater discharges into Clark's Marsh.<sup>41</sup>**

### WHAT REALLY HAPPENED

- One month later, the Air Force refused to investigate Wurtsmith plumes discharging PFOS into adjoining surface waters, arguing that Rule 57 does not apply to groundwater discharges.<sup>42</sup>

**Nov. 2019: The Air Force vowed that its "first priority is protecting human drinking water because drinking water is a direct pathway to human consumption."<sup>43</sup>**

### WHAT REALLY HAPPENED

- Despite these assertions, the Air Force has failed to respect Michigan's new MCLs for PFASs. It has refused

to provide alternate water supplies to residents whose well water has exceeded state MCLs for PFOA or PFOS but not EPA's under-protective lifetime health advisory. In order to adequately protect people and drinking water from PFAS contamination, including groundwater that private well users have traditionally relied on,<sup>44</sup> the Air Force should be complying with Michigan's new MCLs now.



Photo credit: Drew Youngedyke

## Endless Delays

**Apr.–Oct. 2016: EGLE sent substantive requirements documents to the Air Force requiring the Air Force to install three permanent multi-stage activated carbon treatment systems to achieve discharge limitations by the end of 2017.<sup>45</sup>**

### WHAT REALLY HAPPENED

- The Air Force failed to install all required treatment systems until December 2019.<sup>46</sup>

**Oct. 2016: The Air Force said that it planned to award an initial remedial investigation ("RI") of PFAS contamination at Wurtsmith some time in 2017.<sup>47</sup> Under CERCLA, remedial investigations serve as the mechanism for collecting data to determine the nature and extent of contamination, assess risk to human health and the environment, and evaluate treatment technologies.**

### WHAT REALLY HAPPENED

- The Air Force did not award the RI contract until July 2020.<sup>48</sup>

**Apr. 2018: The Air Force refused to provide a timeline for cleanup actions at Wurtsmith, stating that it would determine "whether further action is warranted" at the conclusion of the supplemental site inspection ("SSI") phase.<sup>49</sup>**

### WHAT REALLY HAPPENED

- In April 2020, the Air Force finally said that the earliest any new cleanup efforts might begin is not until 2024.<sup>50</sup>

**Feb. 2020: After Congress appropriated \$13.5 million in the fiscal year 2020 National Defense Authorization Act to PFAS cleanup at Wurtsmith, the Air Force planned to spend all of those funds on studies, claiming that more data is needed.<sup>51</sup>**

### WHAT REALLY HAPPENED

- Because Congress set aside those funds for the purpose of cleanup, the Air Force should have followed that mandate. The bulk of the appropriations should have been used on interim response measures, rather than further investigation of the PFAS problem that the Air Force and state of Michigan had already studied for years.
- Eventually, the Air Force partially reversed course, promising to award contracts for interim cleanup measures designed to expand capture fields around Wurtsmith.<sup>52</sup>

*The Air Force can and must do better in addressing PFAS contamination in Oscoda. It should start by increasing transparency in its processes and becoming more responsive to public concerns. In addition, the Air Force must stop unreasonably drawing out the cleanup process through countless delays, and take actions that will actually remove and prevent the further spread of pollution. The Air Force must act quickly both to prevent harm to people, fish, and wildlife, and to stop remediation costs from spiraling out of control. The longer the Air Force postpones putting multiple treatment measures in place or expanding existing treatment mechanisms, the more expensive the taxpayer-funded cleanup will become.*

# State of Michigan

Although it has sometimes displayed a desire to address the PFAS contamination in Oscoda, the state of Michigan has diminished the value of its efforts by failing to timely and transparently communicate the extent and risks of the PFAS contamination. Consequently, Oscoda residents have understandably lost trust in the state's ability to protect their environment and health. Moreover, the state has repeatedly stumbled and failed to show the community that it will do all in its power to fight on their behalf. All in all, the state has consistently been either unable or unwilling to protect its citizens and natural resources.

## Inability or Unwillingness to Protect People and Natural Resources in Oscoda

**May 2012:** EGLE sampling of fish tissue collected from Clark's Marsh showed PFOS concentrations ranging from 334 to 9580 ppb in pumpkinseed, bluegill, yellow perch, and largemouth bass.<sup>53</sup> Sampling of fish tissue from the lower Au Sable River, Van Etten Lake, Allen Lake, and Lake Huron also showed high concentrations of PFOS.<sup>54</sup>

### WHAT THE STATE SHOULD HAVE DONE

- The state should have immediately warned people, especially local residents and the large number of tourists who visit the area, to not eat fish from these water bodies.

### WHAT THE STATE REALLY DID

- Although the state did issue a do-not-eat-fish advisory for Clark's Marsh and the Au Sable river soon after receiving the troubling sampling results, it did not post fish advisory signs along the Au Sable River, and at Clark's Marsh, Allen Lake, and the Au Sable River, until June 2013.<sup>55</sup>

**Aug. 2012:** Robert Delaney, an MDEQ scientist, delivered a 93-page report that he and Dr. Richard DeGrandchamp, a University of Colorado scientist, had authored on PFAS contamination to then-MDEQ Director Dan Wyant.<sup>56</sup> The report, titled "Michigan's Contaminant Induced Human Health Crisis," warned that extremely high levels of PFAS in fish from the Au Sable and Clark's Marsh areas were likely leading to dangerous levels of PFAS in the blood of some residents of Oscoda.<sup>57</sup> The report also contained significant warnings about the extent of PFAS contamination across the entire state.<sup>58</sup>

### WHAT THE STATE SHOULD HAVE DONE

- In light of the serious threat detailed extensively in the report, Director Wyant and his agency should have immediately acted upon this information to protect public health and the environment.

### WHAT THE STATE REALLY DID

- EGLE hid the report from the public for over five years. In October 2017, Robert Delaney disclosed the report to the public in a radio interview, leaving the agency with no other choice but to acknowledge the report.<sup>59</sup>



Photo credit: Jennifer Hill

- To date, neither the state of Michigan nor the Air Force have implemented methods for identifying, locating, or assisting residents who may have abnormally high levels of PFAS in their blood.

**Jun. 2015:** EGLE published a site assessment stating that 20 PFASs had been detected at the site and multiple plumes exceeding Michigan's water quality criteria were entering water bodies. The site assessment also acknowledged that people who use the natural resources

## Inability or Unwillingness to Protect People and Natural Resources in Oscoda (continued)

around the base might be experiencing high-level toxic exposure.<sup>60</sup>

### WHAT THE STATE SHOULD HAVE DONE

- The state should have quickly and clearly communicated this information, particularly the concerns about natural resource usage around Wurtsmith, to Michiganders.

### WHAT THE STATE REALLY DID

- By failing to adequately share this information at this stage of the PFAS investigation in Oscoda, the state left people in the dark about potential human exposure to contaminated wildlife around Wurtsmith.

**Sept. 2015: MDHHS noted a lack of PFAS sampling in wildlife near Wurtsmith and recommended that such sampling be conducted to evaluate the effects of wild game consumption on human health.<sup>61</sup>**

### WHAT THE STATE SHOULD HAVE DONE

- The state should have commenced wildlife sampling right away so that it could swiftly make appropriate recommendations regarding the safety of wildlife consumption around Wurtsmith.

### WHAT THE STATE REALLY DID

- MDNR sampled muskrat tissue from Clark's Marsh and Tuttle Marsh in Feb. 2016, which showed high levels of PFAS (up to 1,750,000 ppt PFOS).<sup>62</sup> MDNR did not sample deer until 2017, when it sampled 20 deer around Wurtsmith, and found one to have an incredibly high 547 ppb of PFOS in its muscle tissue.<sup>63</sup>

**Feb. 2016: After evaluating private residential well water samples, the state told residents living downstream of the base not to use their water for drinking or cooking.<sup>64</sup>**

### WHAT THE STATE SHOULD HAVE DONE

- The state should have been transparent and candid in informing Oscoda residents of the risks of past and continued consumption of contaminated water. Moreover, the state should have responded with a permanent, protective solution: immediately connecting to municipal water all residences with private wells that were affected by the PFAS plumes, as well as those residences with wells that were likely in the future to be affected.

### WHAT THE STATE REALLY DID

- MDHHS distributed a pamphlet playing down the severity of the problem: for example, it claimed that “[n]o one can say for sure if drinking water that has PFAS in it will harm you.”<sup>65</sup> Furthermore, the state has only helped connect 27 residences to municipal water,<sup>66</sup> refusing to provide the funding needed to connect

residences on the east side of Van Etten Lake to the municipal supply.

**Mar. 2016: The state told residents east of Van Etten Lake not to worry about PFAS contamination from Wurtsmith.<sup>67</sup>**

### WHAT THE STATE SHOULD HAVE DONE

- The state should not have made these assurances without knowing for certain that contamination was not spreading to the east side of Van Etten Lake.

### WHAT THE STATE REALLY DID

- PFAS contamination was later detected in the groundwater on the east side of Van Etten Lake and in Lake Huron.<sup>68</sup> In 2020, EGLE acknowledged that the contaminated groundwater on the southeastern end of Van Etten Lake could be due to infiltration of lake water to near-shore groundwater.<sup>69</sup> At the same time, EGLE continues to claim that it is unable to track the source of the PFAS contamination on the east side of Van Etten Lake.

**Apr. 2017: After previously assuring the Michigan Senate that it was working to comply with Rule 57 for groundwater discharges into Clark's Marsh, the Air Force refused to investigate Wurtsmith plumes discharging PFOS into adjoining surface waters, arguing that Rule 57 does not apply to groundwater discharges.<sup>70</sup>**

### WHAT THE STATE SHOULD HAVE DONE

- The state should have defended the applicability of its own legal standard to these circumstances.

### WHAT THE STATE REALLY DID

- For reasons unknown, the state did not argue against the Air Force's position for several months.

**Jul. 2017: EGLE and the Air Force confirmed that surface water foam from Van Etten Lake was highly contaminated with PFASs, with one sample having over 164,000 ppt PFOS.<sup>71</sup>**

### WHAT THE STATE SHOULD HAVE DONE

- In the absence of reliable information on the safety of touching PFAS foam, the state should have taken a precautionary approach, particularly as children swim in the lake. The state should have issued a foam advisory urging people to avoid all contact with foam at Van Etten Lake.

### WHAT THE STATE REALLY DID

- After initially indicating that it was safe to ingest the foam,<sup>72</sup> MDHHS and EGLE delayed issuing a foam advisory for Van Etten Lake until September 2017.<sup>73</sup> That advisory recommended, “out of an abundance of caution,” that residents avoid accidentally ingesting foam from the



## Inability or Unwillingness to Protect People and Natural Resources in Oscoda (continued)

lake.<sup>74</sup> The advisory noted that “[s]kin contact with the foam is not considered to be of concern.”<sup>75</sup>

- In 2019, the state reversed its position, telling people to avoid coming into contact with the foam at all.<sup>76</sup>

**Dec. 2017: EGLE invoked dispute resolution pursuant to the DSMOA between the Department of Defense and the state of Michigan to resolve various issues stemming from the Air Force’s refusal to do enough to address PFAS contamination at Wurtsmith.<sup>77</sup>**

### WHAT THE STATE SHOULD HAVE DONE

- The state should have used this process to push hard for changes to benefit the Oscoda community.

### WHAT THE STATE REALLY DID

- In July 2020, EGLE told the Air Force that the issues it raised in 2017 have been resolved, thus ending the dispute resolution process.<sup>78</sup> EGLE could have chosen to further escalate the dispute but chose not to, resulting in a weak final outcome.

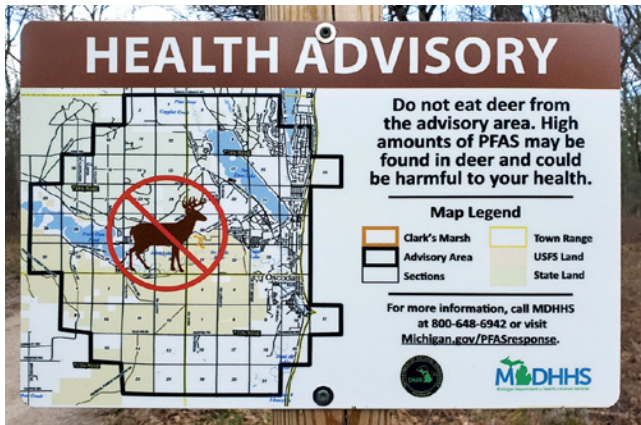


Photo credit: Jennifer Hill

**Oct. 2018: EGLE and MDHHS issued a “do not eat” advisory for deer taken within five miles of Clark’s Marsh.<sup>79</sup>**

### WHAT THE STATE SHOULD HAVE DONE

- Many Oscoda residents rely on hunting wildlife, including deer, for food.<sup>80</sup> The state should have begun sampling in the environment several years earlier—as soon as it became clear that there was widespread contamination in water and soil near Wurtsmith—so that it could have issued this advisory far earlier to protect public health.

### WHAT THE STATE REALLY DID

- The state issued the advisory over eight years after it first discovered widespread PFAS contamination at Wurtsmith, and over three years after MDHHS recommended that wild game near Wurtsmith be sampled for PFASs.<sup>81</sup>

**Dec. 2019: EGLE issued a do not eat advisory for all aquatic and semi-aquatic wildlife taken from the Clark’s Marsh area.<sup>82</sup>**

### WHAT THE STATE SHOULD HAVE DONE

- In order to reach all people affected by the expanded advisory, the state should have very publicly and prominently announced the new advisory.

### WHAT THE STATE REALLY DID

- The state published the advisory notice in a very limited number of fora—on a district health department website and in new advisory signs around the marsh.<sup>83</sup>

**Jul. 2019: EGLE boasted about a verbal deal with the Air Force that a news release said would “accelerate” the investigation into PFAS pollution at Wurtsmith.<sup>84</sup>**

### WHAT THE STATE SHOULD HAVE DONE

- EGLE should have let its actions do the talking by coming to an agreement that compelled the Air Force to act more quickly to clean up the pollution.

### WHAT THE STATE REALLY DID

- The agreement did not commit the Air Force to any new actions, and the Air Force continues to draw out the cleanup process to this day. Meanwhile, EGLE has since failed to expeditiously use all available tools at its disposal to force the Air Force to act in ways that will benefit the state’s people, wildlife, and natural resources. For example, Governor Whitmer’s administration delayed invoking the state’s legal authority to compel the Air Force to clean up PFAS contamination to Michigan’s PFAS standards—an action it should have taken in early 2020—until the end of March 2021.<sup>85</sup> Prior to that action, the administration had merely stated its “expect[ation]” that the Air Force meet the state’s PFAS cleanup standards in Oscoda.<sup>86</sup>

*The state of Michigan must work to repair its relationship with the Oscoda community, and it must more competently protect its people and natural resources. For one, the state needs to be more transparent with the public about the serious risks of the PFAS contamination in Oscoda, and about its strategy to respond to and mitigate those risks. And as a general rule, the state must be far more aggressive in its actions: it must vigorously defend the applicability of its own PFAS cleanup standards to the Air Force’s pollution, and it must proactively use all authorities available to it to keep people, wildlife, and natural resources safe. If the state adopts such an approach, the state will be much more effective in protecting the environment and public health in Oscoda, and it will begin to restore the community’s trust.*

## Endnotes

- 1 Cheryl M. Bartel, Occurrence and Distribution of Perfluorinated Surfactants in Groundwater Contaminated by Fire-Fighting Activity (Nov. 23, 1999) (Ph.D. thesis, Oregon State University); Cheryl A. Moody, Gretchen N. Hebert, Steven H. Strauss, & Jennifer A. Field, *Occurrence and Persistence of Perfluorooctanesulfonate and Other Perfluorinated Surfactants in Groundwater at a Fire-Training Area at Wurtsmith Air Force Base, Michigan, USA*, 5 J. Evtl. Monitoring 341 (2003), <https://pubmed.ncbi.nlm.nih.gov/12729279/>;
- 2 Craig Minor, Introduction of PFAS/AFFF to Wurtsmith Air Force Base Groundwater Contamination 1970-1997, [mitchellsmemoir.com](https://www.mitchellsmemoir.com/introduction-of-pfas-afff-to-wurtsmith-air-force-base-groundwater-contamination-1970-1997/), <https://www.mitchellsmemoir.com/introduction-of-pfas-afff-to-wurtsmith-air-force-base-groundwater-contamination-1970-1997/> (last visited Jan. 22, 2021).
- 3 See, e.g., Ronald H. Kroop, Treatability of Aqueous Film-Forming Foams Used for Fire Fighting, iii/iv, 3 (Feb. 1974) (Air Force report citing toxic effects of AFFF and noting that activated carbon was a “practical” treatment method); Edward E. LeFebvre & Roger C. Inman, Biodegradability and Toxicity of Light Waters FC206 Aqueous Film Forming Foam, at E-25 (Nov. 1974) (Air Force report cited toxic effects of AFFF on fish and recommended that wastewater from firefighting training operations be treated); Melvin E. Andersen et al., The Toxicity of Perfluoro-n-decanoic acid and 2,3,7,8-Tetrachlorodibenzo-p-dioxin in L5178Y Mouse Lymphoma Cells (Mar. 1983) (Air Force report finding PFDA is associated with toxic effects in mice); Memorandum from Curtis Bowling re: Aqueous Film Forming (AFFF) Workshop (2001) (Department of Defense memorandum acknowledging EPA data showing that PFOS is “persistent, bioaccumulating, and toxic”).
- 4 The EPA issued a “lifetime health advisory” for PFOS and PFOA in 2016 to “describe non-regulatory concentrations of drinking water contaminants at or below which adverse health effects are not anticipated to occur over specific exposure durations.” *PFAS Laws and Regulations*, EPA, <https://www.epa.gov/pfas/pfas-laws-and-regulations> (last visited Jan. 22, 2021). That advisory was set at 70 ppt for PFOS and PFOA combined.
- 5 Michigan issued human health surface water quality criteria, known as “Rule 57 values,” for PFOA in 2011 (420 ppt for drinking water sources and 1200 ppt for non-drinking water sources) and for PFOS in 2014 (11 ppt for drinking waters and 12 ppt for non-drinking waters). In addition, in 2020, Michigan set drinking water maximum contaminant levels for seven PFASs (PFNA, PFOA, PFHxA, PFOS, PFHxS, PFBS, and HFPO-DA), and adopted new groundwater cleanup standards for those PFASs, including 16 PPT for PFOS and 8 ppt for PFOA.
- 6 Ronald H. Kroop, Treatability of Aqueous Film-Forming Foams Used for Fire Fighting, iii/iv, 3 (Feb. 1974); Edward E. LeFebvre & Roger C. Inman, Biodegradability and Toxicity of Light Waters FC206 Aqueous Film Forming Foam, at E-25 (Nov. 1974); Melvin E. Andersen et al., The Toxicity of Perfluoro-n-decanoic acid and 2,3,7,8-Tetrachlorodibenzo-p-dioxin in L5178Y Mouse Lymphoma Cells (Mar. 1983) (Air Force report finding PFDA is associated with toxic effects in mice);
- 7 Cheryl M. Bartel, Occurrence and Distribution of Perfluorinated Surfactants in Groundwater Contaminated by Fire-Fighting Activity (Nov. 23, 1999) (Ph.D. thesis, Oregon State University), [https://ir.library.oregonstate.edu/concern/graduate\\_thesis\\_or\\_dissertations/b2773x806](https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/b2773x806). With the assistance of funding from the National Institute of Environmental Health Sciences (“NIEHS”), findings based on this research were later published in a scientific journal in 2003, see *supra* note 1.
- 8 In a 2019 executive order, Governor Whitmer reorganized MDEQ as EGLE. Mich. Exec. Order No. 2019-06 (Feb. 20, 2019). For purposes of clarity, this document will refer to the agency as “EGLE” when describing the agency both pre- and post-reorganization.
- 9 Robert Delaney, *Michigan PFAS Response Timeline*, at 1 (Nov. 7, 2018) (on file with Need Our Water) [hereinafter Delaney timeline].
- 10 Delaney timeline at 2; Garret Ellison, Major Warning About Michigan PFAS Crisis Came 6 Years Ago, MLive, Jul. 10, 2018, [https://www.mlive.com/news/2018/07/meq\\_pfas\\_delaney\\_2012\\_report.html](https://www.mlive.com/news/2018/07/meq_pfas_delaney_2012_report.html).
- 11 Delaney timeline at 2.
- 12 Dep’t of Def., *Risk Alert #03-11, Chemical & Material Emerging Risk Alert: Aqueous Film Forming Foam (AFFF)*, at 1 (Mar. 2011).
- 13 Delaney timeline at 2-3.
- 14 Letter from Stephen G. TerMaath to Robert Wagner re: Your letter dated 29 Feb 16, Residential Well Protection Perfluoroalkyl and Polyfluoroalkyl Chemicals, Former Wurtsmith Air Force Base, Iosco County, Michigan, at 1 (Mar. 18, 2016), [https://www.michigan.gov/documents/deq/2016-02-29\\_WAFB\\_DEQ\\_and\\_AF\\_Letters\\_Feb\\_to\\_March\\_618959\\_7.pdf](https://www.michigan.gov/documents/deq/2016-02-29_WAFB_DEQ_and_AF_Letters_Feb_to_March_618959_7.pdf); David Strange, *Former Wurtsmith AFB Community Meeting Presentation*, at 7 (Oct. 25, 2016), [https://www.michigan.gov/documents/mdhhs/AF\\_Wurtsmith\\_PublicMeeting\\_Oct25\\_v3\\_545603\\_7.pdf](https://www.michigan.gov/documents/mdhhs/AF_Wurtsmith_PublicMeeting_Oct25_v3_545603_7.pdf).

- 15 Letter from Kathleen Shirey to Benjamin Marrs re: Notice of Invocation of Dispute Resolution Concerning the Former Wurtsmith United States Air Force Base (WAFB) and Response to Impacts to Drinking Water from Per- and Polyfluoroalkyl Substances (PFAS); Site ID No. 35000058, (Dec. 14, 2017), [https://www.michigan.gov/documents/som/Letter\\_to\\_AFCEC\\_Marrs\\_from\\_DEQ\\_Shirey\\_dated\\_121417\\_608968\\_7.pdf](https://www.michigan.gov/documents/som/Letter_to_AFCEC_Marrs_from_DEQ_Shirey_dated_121417_608968_7.pdf).
- 16 MDHHS, *Former Wurtsmith Air Force Base—PFCs in Fish and Drinking Water*, at 17 (Mar. 23, 2016), [https://www.michigan.gov/documents/mdhhs/MDHHSpublicmtg-3-23-16\\_520797\\_7.pdf](https://www.michigan.gov/documents/mdhhs/MDHHSpublicmtg-3-23-16_520797_7.pdf).
- 17 Delaney timeline at 7.
- 18 Letter from Stephen G. TerMaath to Kathleen Shirey, at 2-3 (Jan. 11, 2018), [https://www.michigan.gov/documents/deq/2018-01-11\\_AF\\_Response\\_to\\_DSMOA\\_Dispute\\_618969\\_7.pdf](https://www.michigan.gov/documents/deq/2018-01-11_AF_Response_to_DSMOA_Dispute_618969_7.pdf).
- 19 Letter from Stephen G. TerMaath to Robert Wagner re: Your letter dated 29 Feb 16, Residential Well Protection Perfluoroalkyl and Polyfluoroalkyl Chemicals, Former Wurtsmith Air Force Base, Iosco County, Michigan, at 2 (Mar. 18, 2016), [https://www.michigan.gov/documents/deq/2016-02-29\\_WAFB\\_DEQ\\_and\\_AF\\_Letters\\_Feb\\_to\\_March\\_618959\\_7.pdf](https://www.michigan.gov/documents/deq/2016-02-29_WAFB_DEQ_and_AF_Letters_Feb_to_March_618959_7.pdf).
- 20 Letter from Stephen G. TerMaath to Kathleen Shirey, at 2-3 (Jan. 11, 2018), [https://www.michigan.gov/documents/deq/2018-01-11\\_AF\\_Response\\_to\\_DSMOA\\_Dispute\\_618969\\_7.pdf](https://www.michigan.gov/documents/deq/2018-01-11_AF_Response_to_DSMOA_Dispute_618969_7.pdf).
- 21 David Strainge, *Former Wurtsmith AFB Community Meeting*, at 6 (Oct. 25, 2016), [https://www.michigan.gov/documents/mdhhs/AF\\_Wurtsmith\\_PublicMeeting\\_Oct25\\_v3\\_545603\\_7.pdf](https://www.michigan.gov/documents/mdhhs/AF_Wurtsmith_PublicMeeting_Oct25_v3_545603_7.pdf).
- 22 Delaney timeline at 8.
- 23 *Id.*
- 24 Letter from Kathleen Shirey to Benjamin Marrs, at 2 (Dec. 14, 2017), [https://www.michigan.gov/documents/som/Letter\\_to\\_AFCEC\\_Marrs\\_from\\_DEQ\\_Shirey\\_dated\\_121417\\_608968\\_7.pdf](https://www.michigan.gov/documents/som/Letter_to_AFCEC_Marrs_from_DEQ_Shirey_dated_121417_608968_7.pdf).
- 25 Letter from Stephen G. TerMaath to Kathleen Shirey re: Notice of Invocation of Dispute Resolution Concerning the Former Wurtsmith United States Air Force Base (WAFB) and Response to Impacts to Drinking Water from Per- and Polyfluoroalkyl Substances (PFAS); Site ID No. 35000058, at 1 (Jan. 11, 2018), [https://www.michigan.gov/documents/deq/2018-01-11\\_AF\\_Response\\_to\\_DSMOA\\_Dispute\\_618969\\_7.pdf](https://www.michigan.gov/documents/deq/2018-01-11_AF_Response_to_DSMOA_Dispute_618969_7.pdf).
- 26 Letter from Stephen G. TerMaath to Kathleen Shirey re: Dispute Resolution (DR) Concerning the Former Wurtsmith Air Force Base and Response to Impacts to Drinking Water from PFOS / PFOA Substances, Site ID No. 35000058, at 4 (Mar. 15, 2018), [https://www.michigan.gov/documents/deq/2018-03-15\\_AF\\_Response\\_to\\_DSMOA\\_Dispute\\_Letter\\_Feb\\_8\\_thru\\_Mar\\_2\\_618970\\_7.pdf](https://www.michigan.gov/documents/deq/2018-03-15_AF_Response_to_DSMOA_Dispute_Letter_Feb_8_thru_Mar_2_618970_7.pdf).
- 27 Delaney timeline at 4.
- 28 Paula Gardner & Garret Ellison, *Michigan's Next Water Crisis Is PFAS—and You May Already Be Affected*, *mLive.com*, Jul. 10, 2018, [https://www.mlive.com/news/page/michigans\\_water\\_crisis\\_pfas.html](https://www.mlive.com/news/page/michigans_water_crisis_pfas.html).
- 29 Dep't of Def., *Alternatives to Aqueous Film Forming Foam 8* (Jun. 2018), <https://www.documentcloud.org/documents/5766754-2018-06-DOD-AFFF-Alt-Report-to-Congress-July2018-1.html>.
- 30 Eric Lipton & Julie Turkewitz, *Pentagon Pushes for Weaker Standards on Chemicals Contaminating Drinking Water*, *N.Y. Times*, Mar. 14, 2019, <https://www.nytimes.com/2019/03/14/us/politics/chemical-standards-water-epa-pentagon.html>; Agency for Toxic Substances & Disease Registry, *Toxicological Profile for Perfluoroalkyls: Draft for Public Comment* (Jun. 2018), <https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf>.
- 31 Jeffrey Dintzer & Clynton Namuo, *Federal Agencies Dig In for Prolonged PFAS Fight*, *Law360*, May 22, 2019.
- 32 Letter from Teresa Seidel to Benjamin Marrs re: Violation Notice No. VN-008900, Substantive Requirements Document (SRD) No. MIU990034, Designated Name: USAF-Wurtsmith AFB (Oct. 19, 2018), [https://www.michigan.gov/documents/pfasresponse/Letter\\_from\\_DEQ\\_Seidel\\_to\\_USAF\\_Marrs\\_dated\\_101918\\_648332\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/Letter_from_DEQ_Seidel_to_USAF_Marrs_dated_101918_648332_7.pdf); *see also* Garret Ellison, *Quit 'horsing around' at Wurtsmith, Oscoda residents tell Air Force*, *mLive.com*, Apr. 24, 2019, <https://www.mlive.com/news/2019/04/quit-horsing-around-at-wurtsmith-oscoda-residents-tell-air-force.html>.
- 33 Letter from Stephen G. TerMaath to Teresa Seidel re: Violation Notice No. VN-0082900, Substantive Requirements Document (SRD) No. MIU990034 Designated Name: USAF-Wurtsmith AFB, MI, at 3-4 (Dec. 7, 2018), [https://www.michigan.gov/documents/pfasresponse/Letter\\_from\\_USAF\\_Termaath\\_to\\_DEQ\\_Seidel\\_dated\\_120718\\_648045\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/Letter_from_USAF_Termaath_to_DEQ_Seidel_dated_120718_648045_7.pdf).
- 34 *Id.* at 2-4.
- 35 Letter from Stephen G. TerMaath to Mike Neller re: Dispute Resolution Concerning the Former Wurtsmith United

- States Air Force Base (Wurtsmith) and Response to Impacts to Drinking Water from Per- and Polyfluoroalkyl Substances (PFAS); Site ID No. 35000058, at 1 (Sept. 2, 2020), [https://www.michigan.gov/documents/pfasresponse/Letter\\_to\\_EGLE\\_Neller\\_from\\_AFCEC\\_Termaath\\_re\\_Dispute\\_Resolution\\_Concerning\\_WAFB\\_and\\_Response\\_to\\_Impacts\\_to\\_Drinking\\_Water\\_from\\_PFAS\\_703002\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/Letter_to_EGLE_Neller_from_AFCEC_Termaath_re_Dispute_Resolution_Concerning_WAFB_and_Response_to_Impacts_to_Drinking_Water_from_PFAS_703002_7.pdf).
- 36 Letter from Mike Neller to Stephen G. TerMaath re: Interim Actions to Remove Per- and Polyfluoroalkyl Substances (PFAS); Former Wurtsmith United States Air Force Base; Iosco County, Michigan; Site ID No. 35000058, at 1-2 (Jan. 31, 2020), [https://www.michigan.gov/documents/pfasresponse/EGLE\\_Request\\_for\\_Interim\\_Response\\_January\\_31\\_2020\\_687737\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/EGLE_Request_for_Interim_Response_January_31_2020_687737_7.pdf); Letter from Stephen G. TerMaath to Mike Neller re: Interim Actions to Remove Per- and Polyfluoroalkyl Substances (PFAS); Former Wurtsmith United States Air Force Base; Iosco County, Michigan; Site ID No. 35000058, at 1 (Mar. 2, 2020), [https://www.michigan.gov/documents/pfasresponse/Air\\_Force\\_Response\\_to\\_EGLE\\_Request\\_for\\_Interim\\_Response\\_March\\_3\\_2020\\_687738\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/Air_Force_Response_to_EGLE_Request_for_Interim_Response_March_3_2020_687738_7.pdf).
- 37 Garret Ellison, *Air Force Plans New Cleanup at Wurtsmith Base, But Questions Remain*, mlive.com, <https://www.mlive.com/news/2020/06/air-force-plans-new-cleanup-at-wurtsmith-base-but-questions-remain.html>; AFCEC, *Wurtsmith Restoration Advisory Board Meeting 21 Oct 2020*, at 19, [https://www.michigan.gov/documents/pfasresponse/AFCEC\\_Wurtsmith\\_Restoration\\_Advisory\\_Board\\_Meeting\\_-\\_October\\_21\\_2020\\_705831\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/AFCEC_Wurtsmith_Restoration_Advisory_Board_Meeting_-_October_21_2020_705831_7.pdf).
- 38 Garret Ellison, *Air Force Has No Plans to Speed Cleanup at Wurtsmith Base*, mlive.com, Apr. 15, 2020, <https://www.mlive.com/news/2020/04/air-force-has-no-plans-to-speed-cleanup-at-wurtsmith-base.html>.
- 39 *Michigan Adopts Strict PFAS in Drinking Water Standards*, MPART (Jul. 22, 2020), [https://www.michigan.gov/pfasresponse/0,9038,7-365-86513\\_96296-534663--,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86513_96296-534663--,00.html)
- 40 See Keith Matheny, *Restrictions Expanded Near Former Wurtsmith Air Base After PFAS Found in Most Wildlife*, Detroit Free Press, May 28, 2020, <https://www.freep.com/story/news/local/michigan/2020/05/28/study-pfas-wildlife-wurtsmith-base-oscodas-clark-marsh/5269495002/>.
- 41 Letter to Associate Director of the Michigan Senate Fiscal Agency (Mar. 17, 2017) (stating that the “Air Force is ... working ... to ensure compliance with [Rule 57 values] for PFOA and PFOS in groundwater entering Clarks Marsh”).
- 42 Letter from Stephen G. TerMaath to Teresa Seidel re: Violation Notice No. VN-008900, Substantive Requirements Document (SRD) No. MIU990034 Designated Name: USAF-Wurtsmith AFB, MI, at 2 (Dec. 7, 2018), [https://www.michigan.gov/documents/pfasresponse/Letter\\_from\\_USAF\\_Termaath\\_to\\_DEQ\\_Seidel\\_dated\\_120718\\_648045\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/Letter_from_USAF_Termaath_to_DEQ_Seidel_dated_120718_648045_7.pdf)
- 43 Jim Malewitz, *Michigan Found PFAS in Oscoda in 2010. There’s Still No Plan to Clean It Up.*, Bridge Mich., Nov. 18, 2019, <https://www.bridgemi.com/michigan-environment-watch/michigan-found-pfas-oscodas-2010-theres-still-no-plan-clean-it>.
- 44 As of July 8, 2020, the Air Force has connected one residence to the municipal water supply, while District Health Department 2 has provided filters to 196 residences, water coolers to 50 residences, and connections to municipal water to 27 residences. *Iosco County, Oscoda, Oscoda Area*, MPART, [https://www.michigan.gov/pfasresponse/0,9038,7-365-86511\\_82704\\_97100---,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86511_82704_97100---,00.html) (last visited Feb. 4, 2021).
- 45 EGLE, Substantive Requirements Document (SRD) for the Department of Defense - Wurtsmith Air Force Base (WAFB), MIU990034 (Apr. 15, 2016), [https://www.michigan.gov/documents/deq/Wurtsmith\\_USAF\\_FT-02\\_SRD\\_Signed\\_April\\_15\\_2016\\_610281\\_7.pdf](https://www.michigan.gov/documents/deq/Wurtsmith_USAF_FT-02_SRD_Signed_April_15_2016_610281_7.pdf); EGLE, Substantive Requirements Document (SRD) for the Department of Defense - Wurtsmith Air Force Base (WAFB), MIU990027 (Oct. 7, 2016), [https://www.michigan.gov/documents/deq/Wurtsmith\\_Combined\\_SRD\\_Issued\\_100716\\_610282\\_7.pdf](https://www.michigan.gov/documents/deq/Wurtsmith_Combined_SRD_Issued_100716_610282_7.pdf).
- 46 Letter from Teresa Seidel to Benjamin Marrs re: Former Wurtsmith Air Force Base Substantive Requirements Document (SRD) for Arrow Street Pump and Treat System, Benzene Plant Pump and Treat System, and Mission Street Pump and Treat System, at 1-2 (Nov. 3, 2017), [https://www.michigan.gov/documents/deq/Letter\\_to\\_USDAF\\_Marrs\\_from\\_DEQ\\_Seidel\\_dated\\_110317\\_610279\\_7.pdf](https://www.michigan.gov/documents/deq/Letter_to_USDAF_Marrs_from_DEQ_Seidel_dated_110317_610279_7.pdf); *Former Wurtsmith Air Force Base Historical Timeline*, MPART, [https://www.michigan.gov/pfasresponse/0,9038,7-365-86511\\_82704\\_83952-502085--,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86511_82704_83952-502085--,00.html) (last visited Jan. 22, 2021).
- 47 David Strainge, *Former Wurtsmith AFB Community Meeting*, at 10 (Oct. 25, 2016), [https://www.michigan.gov/documents/mdhhs/AF\\_Wurtsmith\\_PublicMeeting\\_Oct25\\_v3\\_545603\\_7.pdf](https://www.michigan.gov/documents/mdhhs/AF_Wurtsmith_PublicMeeting_Oct25_v3_545603_7.pdf).
- 48 Air Force Civ. Engineer Ctr., *Wurtsmith Restoration Advisory Board Meeting*, at 11 (Oct. 21, 2020), [https://www.michigan.gov/documents/pfasresponse/AFCEC\\_Wurtsmith\\_Restoration\\_Advisory\\_Board\\_Meeting\\_-\\_October\\_21\\_2020\\_705831\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/AFCEC_Wurtsmith_Restoration_Advisory_Board_Meeting_-_October_21_2020_705831_7.pdf).
- 49 AFCEC, *RAB Questions 18 April 2018 Wurtsmith RAB Meeting*, [https://www.michigan.gov/documents/pfasresponse/Wurtsmith\\_RAB\\_Meeting\\_Questions\\_-\\_April\\_18\\_2019\\_659672\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/Wurtsmith_RAB_Meeting_Questions_-_April_18_2019_659672_7.pdf) (last visited Jan. 27, 2021).

- 50 Garret Ellison, *Air Force Has No Plans to Speed Cleanup at Wurtsmith Base*, mlive.com, Apr. 15, 2020, <https://www.mlive.com/news/2020/04/air-force-has-no-plans-to-speed-cleanup-at-wurtsmith-base.html>.
- 51 Kelly House, *As Michigan Makes PFAS Strides, Oscoda Residents Say Air Force Is Stalling*, Bridge Mich., Aug. 17, 2020, <https://www.bridgemi.com/michigan-environment-watch/michigan-makes-pfas-strides-oscoda-residents-say-air-force-stalling>.
- 52 Ben Thorp, *Air Force Announces Cleanup Efforts in Oscoda But Some Residents Remain Skeptical*, Mich. Radio, Jun. 16, 2020, <https://www.michiganradio.org/post/air-force-announces-cleanup-efforts-oscoda-some-residents-remain-skeptical>.
- 53 Mich. Dep't of Cmty. Health, *PFOS - Fish Sampling Results*, at 2 (last updated Apr. 2015), [https://www.michigan.gov/documents/mdch/fish\\_data\\_handout\\_449030\\_7.pdf](https://www.michigan.gov/documents/mdch/fish_data_handout_449030_7.pdf).
- 54 *Id.*
- 55 Mich. Dep't of Cmty. Health, *PFOS - Fish Sampling Results*, at 1 (last updated Apr. 2015), [https://www.michigan.gov/documents/mdch/fish\\_data\\_handout\\_449030\\_7.pdf](https://www.michigan.gov/documents/mdch/fish_data_handout_449030_7.pdf).
- 56 Garret Ellison, *Major Warning About Michigan PFAS Crisis Came 6 Years Ago*, Mlive.com, Jan. 30, 2019, [mlive.com/news/2018/07/meq\\_pfas\\_delaney\\_2012\\_report.html](https://www.mlive.com/news/2018/07/meq_pfas_delaney_2012_report.html).
- 57 Robert Delaney & Richard DeGrandchamp, *Michigan's Contaminant Induced Human Health Crisis: Addressing Michigan's Future by Facing the Challenge of the Evolving Nature of Environmental Contamination*, Issue Paper #1, at 3 (Aug. 2012), <https://www.hsgac.senate.gov/imo/media/doc/Delaney%20Attachment%204.pdf>.
- 58 *Id.*
- 59 Garret Ellison, *Major Warning About Michigan PFAS Crisis Came 6 Years Ago*, Mlive.com, Jan. 30, 2019, [mlive.com/news/2018/07/meq\\_pfas\\_delaney\\_2012\\_report.html](https://www.mlive.com/news/2018/07/meq_pfas_delaney_2012_report.html).
- 60 Garret Ellison, *Toxic Water Near Old Michigan Air Force Base Prompts New Scrutiny*, mlive.com, May 20, 2016, [https://www.mlive.com/news/2016/05/wurtsmith\\_air\\_force\\_base\\_pfcs.html](https://www.mlive.com/news/2016/05/wurtsmith_air_force_base_pfcs.html).
- 61 Mich. Dep't of Cmty. Health, *Letter Health Consultation: Evaluation of Wild Game near Wurtsmith Air Force Base, Oscoda, Iosco County, Michigan* (Sept. 24, 2015), [https://www.michigan.gov/documents/mdch/Wurtsmith\\_AFB\\_Wild\\_Game\\_\\_LHC\\_500702\\_7.pdf](https://www.michigan.gov/documents/mdch/Wurtsmith_AFB_Wild_Game__LHC_500702_7.pdf).
- 62 Delaney timeline at 8.
- 63 *'Do Not Eat' Advisory Issued for Deer Taken within five miles of Clark's Marsh, Oscoda Township*, MPART (Oct. 19, 2018), [https://www.michigan.gov/pfasresponse/0,9038,7-365-86511\\_82704\\_83952-481207--,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86511_82704_83952-481207--,00.html).
- 64 *Former Wurtsmith Air Force Base, Iosco County*, michigan.gov, [https://www.michigan.gov/som/0,4669,7-192-45414\\_45929\\_45942-285528--,00.html](https://www.michigan.gov/som/0,4669,7-192-45414_45929_45942-285528--,00.html) (last visited Jan. 26, 2021).
- 65 MDHHS, *Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water Wells Near the Former Wurtsmith Air Force Base* (updated Dec. 2017), [https://www.dhd2.org/wp-content/uploads/2017/12/2017-12-04-PFAS-in-Drinking-Water-Wells\\_PUB-APPROVED.pdf](https://www.dhd2.org/wp-content/uploads/2017/12/2017-12-04-PFAS-in-Drinking-Water-Wells_PUB-APPROVED.pdf).
- 66 *Iosco County, Oscoda, Oscoda Area*, MPART, [https://www.michigan.gov/pfasresponse/0,9038,7-365-86511\\_82704\\_97100---,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86511_82704_97100---,00.html) (last visited Feb. 4, 2021).
- 67 Paula Gardner & Garret Ellison, *Michigan's Next Water Crisis Is PFAS—and You May Already Be Affected*, mlive.com, Jul. 10, 2018, [https://www.mlive.com/news/page/michigans\\_water\\_crisis\\_pfas.html](https://www.mlive.com/news/page/michigans_water_crisis_pfas.html).
- 68 Paula Gardner & Garret Ellison, *Michigan's Next Water Crisis Is PFAS—and You May Already Be Affected*, mlive.com, Jul. 10, 2018, [https://www.mlive.com/news/page/michigans\\_water\\_crisis\\_pfas.html](https://www.mlive.com/news/page/michigans_water_crisis_pfas.html).
- 69 AFCEC, *Former Wurtsmith AFB Virtual Restoration Advisory Board (RAB) Meeting 15 April 2020*, at 4-5, [https://www.afcec.af.mil/Portals/17/documents/BRAC/Wurtsmith/200415\\_Wurtsmith\\_RAB/200415\\_Wurtsmith\\_Meeting%20Minutes.pdf?ver=2020-07-15-141510-277](https://www.afcec.af.mil/Portals/17/documents/BRAC/Wurtsmith/200415_Wurtsmith_RAB/200415_Wurtsmith_Meeting%20Minutes.pdf?ver=2020-07-15-141510-277).
- 70 Letter to Associate Director of the Michigan Senate Fiscal Agency (Mar. 17, 2017) (stating that the "Air Force is ... working ... to ensure compliance with [Rule 57 values] for PFOA and PFOS in groundwater entering Clarks Marsh").
- 71 *Van Etten Lake*, MPART, [https://www.michigan.gov/pfasresponse/0,9038,7-365-86511\\_82704\\_83952-512946--,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86511_82704_83952-512946--,00.html) (last visited Jan. 22, 2021).
- 72 Jenny Hagland, *MDHHS Says Van Etten Lake Foam Is Not a Harm to Human Health*, Iosco Cty. News-Herald & Oscoda Press, Aug. 9, 2017, [http://www.iosconews.com/oscoda\\_press/news/article\\_4ceac018-7c62-11e7-b5b2-e7eb54fd2592.html](http://www.iosconews.com/oscoda_press/news/article_4ceac018-7c62-11e7-b5b2-e7eb54fd2592.html).

- 73 *Additional Information*, Dist. Health Dep't No. 2, <https://www.dhd2.org/additional-information> (last visited Jan. 27, 2021).
- 74 *Id.*
- 75 *Id.*
- 76 Garret Ellison, *Don't Touch Toxic PFAS Foam, Michigan Officials Now Warn*, mlive.com, Apr. 30, 2019, <https://www.mlive.com/news/2019/04/dont-touch-toxic-pfas-foam-michigan-officials-now-warn.html>.
- 77 Letter from Kathleen Shirey to Benjamin Marrs re: Notice of Invocation of Dispute Resolution Concerning the Former Wurtsmith United States Air Force Base (WAFB) and Response to Impacts to Drinking Water from Per- and Polyfluoroalkyl Substances (PFAS); Site ID No. 35000058 (Dec. 14, 2017), [https://www.michigan.gov/documents/som/Letter\\_to\\_AFCEC\\_Marrs\\_from\\_DEQ\\_Shirey\\_dated\\_121417\\_608968\\_7.pdf](https://www.michigan.gov/documents/som/Letter_to_AFCEC_Marrs_from_DEQ_Shirey_dated_121417_608968_7.pdf).
- 78 Letter from Mike Neller to Stephen G. TerMaath re: Dispute Resolution Concerning the Former Wurtsmith united States Air Force Base (AF) and Response to impacts to Drinking Water from Per- and Polyfluoroalkyl Substances (PFAS); Site ID No. 35000058 (Jul. 16, 2020), [https://www.michigan.gov/documents/pfasresponse/Wurtsmith\\_AFB\\_Dispute\\_Response-07162020\\_696589\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/Wurtsmith_AFB_Dispute_Response-07162020_696589_7.pdf).
- 79 'Do Not Eat' Advisory Issued for Deer Taken within five miles of Clark's Marsh, Oscoda Township, MPART (Oct. 19, 2018), [https://www.michigan.gov/pfasresponse/0,9038,7-365-86511\\_82704\\_83952-481207--,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86511_82704_83952-481207--,00.html).
- 80 Jennifer Chambers & Beth LeBlanc, *State: Don't Eat Deer in Part of Oscoda Due to PFAS Chemical Contamination*, Detroit News, Oct. 19, 2018, <https://www.detroitnews.com/story/news/local/michigan/2018/10/19/pfas-behind-do-not-eat-advisory-deer-oscodas/1695220002/>.
- 81 Mich. Dep't of Cmty. Health, Letter Health Consultation: Evaluation of Wild Game near Wurtsmith Air Force Base, Oscoda, Iosco County, Michigan (Sept. 24, 2015), [https://www.michigan.gov/documents/mdch/Wurtsmith\\_AFB\\_Wild\\_Game\\_\\_LHC\\_500702\\_7.pdf](https://www.michigan.gov/documents/mdch/Wurtsmith_AFB_Wild_Game__LHC_500702_7.pdf).
- 82 Memorandum from Gary Klase & Abiy Mussa to Deb MacKenzie-Taylor re: Public Health Advisory for Wildlife from Clark's Marsh (Dec. 8, 2019), [https://www.dhd2.org/wp-content/uploads/2019/12/APPROVED-Clarks-Marsh-Memo\\_Do-Not-Eat-Wildlife.pdf](https://www.dhd2.org/wp-content/uploads/2019/12/APPROVED-Clarks-Marsh-Memo_Do-Not-Eat-Wildlife.pdf) (MDHHS memorandum stating that a do not eat advisory for all resident aquatic and semi-aquatic wildlife taken from Clark's Marsh is appropriate).
- 83 Keith Matheny, *Restrictions Expanded Near Former Wurtsmith Air Base After PFAS Found in Most Wildlife*, Detroit Free Press, May 28, 2020, <https://www.freep.com/story/news/local/michigan/2020/05/28/study-pfas-wildlife-wurtsmith-base-oscodas-clark-marsh/5269495002/>.
- 84 EGLE, *EGLE and USAF Announce Progress to Accelerate PFAS Investigation and Treatment at Former Wurtsmith Air Force Base* (Jul. 1, 2019), [https://www.michigan.gov/egle/0,9429,7-135-3308\\_3323-500929--,00.html](https://www.michigan.gov/egle/0,9429,7-135-3308_3323-500929--,00.html); see also Jim Malewitz, *Michigan Found PFAS in Oscoda in 2010. There's Still No Plan to Clean It Up.*, Bridge Mich., Nov. 18, 2019, <https://www.bridgemi.com/michigan-environment-watch/michigan-found-pfas-oscodas-2010-theres-still-no-plan-clean-it>.
- 85 Letter from Governor Gretchen Whitmer to Secretary Lloyd Austin (Mar. 31, 2021), [https://www.michigan.gov/documents/pfasresponse/Letter-2021-03-31-MIGOV-USDOD\\_721009\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/Letter-2021-03-31-MIGOV-USDOD_721009_7.pdf); see also National Defense Authorization Act for Fiscal Year 2020, Pub. L. No. 116-92, § 332(a)(1)–(2), 133 Stat. 1198, 1313-14 (2019) ("Upon request from the Governor or chief executive of a State, the Secretary of Defense shall work expeditiously, pursuant to section 2701(d) of title 10, United States Code, to finalize a cooperative agreement, or amend an existing cooperative agreement to address testing, monitoring, removal, and remedial actions relating to the contamination or suspected contamination of drinking, surface, or ground water from PFAS originating from activities of the Department of Defense by providing the mechanism and funding for the expedited review and approval of documents of the Department related to PFAS investigations and remedial actions from an active or decommissioned military installation, including a facility of the National Guard ... A cooperative agreement finalized or amended under paragraph (1) shall meet or exceed the most stringent of the following standards for PFAS in any environmental media: (A) An enforceable State standard, in effect in that State, for drinking, surface, or ground water ...").
- 86 Letter from Governor Gretchen Whitmer to Air Force Assistant Secretary John Henderson (Sept. 22, 2020), [https://www.michigan.gov/documents/pfasresponse/Letter\\_to\\_ASAG\\_Henderson\\_from\\_MI\\_Gov\\_Whitmer\\_re\\_USAF\\_Compliance\\_with\\_SOM\\_Standards\\_for\\_PFAS\\_in\\_Clean-up\\_at\\_Wurtsmith\\_Air\\_Force\\_Base\\_703435\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/Letter_to_ASAG_Henderson_from_MI_Gov_Whitmer_re_USAF_Compliance_with_SOM_Standards_for_PFAS_in_Clean-up_at_Wurtsmith_Air_Force_Base_703435_7.pdf).