



(Photo: Nick Musloe, resident)

# **LESSONS FROM ROCHESTER'S CHEMICAL RELEASES**

Preparing for Industrial Emergencies in Beaver County, PA

Author: Jake Wiedemer

Beaver County Marcellus Awareness Community Outreach Coordinator

# TABLE OF CONTENTS

<b>BACKGROUND</b>	<b>03</b>
<b>THE INCIDENT</b>	<b>04</b>
<b>WHAT MADE UP THE PLUME?</b>	<b>07</b>
<b>\$3 MILLION CLEANUP COST</b>	<b>08</b>
<b>QUESTIONS WE ARE LEFT WITH</b>	<b>10</b>
<b>REFERENCES</b>	<b>14</b>



(Photo: Nick Musloe, resident)

## BACKGROUND

The town of Rochester, located in Beaver County, is composed of Rochester Borough, Rochester Township and East Rochester; its location borders the convergence of the Ohio and Beaver Rivers.

Now closed, Pool Doctor - Beaver Alkali Products, a swimming pool chemical supply business and laboratory, was located at 25 New York Ave., directly adjacent to Beaver Valley Bowl (operating its lab on a floor in this shared larger building). The site was most recently owned by Harold B. Davidson, who had inherited the business from his father, Harold W. Davidson. The business did not operate under any DEP permits.

According to the Pennsylvania Department of Environmental Protection, "In approximately 2016, DEP received an anonymous complaint which prompted an investigation and visit to the site. DEP also reached out to the property owner seeking information but received no response.<sup>1</sup>" It would not be until June 2018 that the DEP could get in touch with the mortgagee company and begin the process of a Hazardous Site Cleanup.

In March 2019, the DEP was given access to the site and assigned contractor Michael Baker for cleanup assistance.

On May 23, 2019, Paul Vogel, who had been running the DEP's Hazardous Sites Cleanup Program, wrote to Rochester Borough Manager John Barret: "This is to inform you that Department of Environmental Protection has determined that the Pool Doctor / Beaver Alkali Site. . . poses a threat to human health and the environment due to the many containers of abandoned chemicals being stored at the site"; Vogel also noted the "dilapidated" buildings.<sup>2</sup>

On June 24, the smaller building "almost completely collapsed." The DEP later notes that "The reaction and subsequent fire appear to have started from a reaction within an inaccessible portion of the smaller building."<sup>3</sup>

On July 1, 2019, the DEP, along with contractor Michael Baker, actually began the process of removing hazardous materials and found unmarked, mislabeled and improperly stored chemicals. Over 1,000 containers of waste, most of which was hazardous, were disposed of or recycled.

Pool Doctor - Beaver Alkali's property owner, Harold Davidson, had not been reporting any of the hazardous chemicals stored on the property for several years prior to this incident.

## THE INCIDENT

Friday July 12, 2019: Investigators believe the building's collapsing roof caused a mixing of chemicals that erupted in flames. At 9:06 p.m. on Friday, "County 911 received the initial call . . . that the former Beaver Alkali Products property on New York Avenue was on fire and emitting yellow smoke." Around 9:15 p.m., "County emergency services officials issued text, email and phone alerts" to people within a five-mile radius, advising them to "shelter-in-place."<sup>4</sup>

This initial alert to roughly 27,000 people did not detail the nature of the incident, that there had been a chemical release from a reaction at Pool Doctor-Beaver Alkali; instead it cautioned, "Anyone receiving this message, you are requested to shelter in place due to an incident until further notice," a message which some recipients found to be vague.<sup>5</sup> Other residents did not receive a notification until 11:51 pm.

Chief Michael Mamone of the Rochester Fire Department, and several other fire departments, fought the initial fire for eight hours. Mamone attributed the formation of the chlorine plume prompting the shelter-in-place recommendation to water from his department's hoses, but he also said the alternative "would have been a possible spread of the fire to the adjacent building which contains similar chemicals."<sup>6</sup>



As The Beaver County Times reported, residents living within a five-mile radius of Rochester were advised to stay indoors just before midnight on Friday and "again Saturday morning after a chemical fire at a former industrial site along the Ohio River." The Times also reported Chief Mamone as saying that "six dumpsters adjacent to the site, which is part of a project overseen by the state Department of Environmental Protection, could cause additional chemical releases if the chlorine tablets inside spontaneously combust again."<sup>7</sup>

Beaver County 911 said Route 65 was closed in both directions Friday night and Saturday morning, as well as the Rochester-Monaca Bridge. The Beaver municipal pool delayed opening until noon Saturday because of the incident.<sup>8</sup>

Saturday morning, July 13: Shelter-in-place orders for residents who were signed up to receive them were lifted early Saturday morning before 5 a.m. Later in the morning at about 9:30 a.m., a second notification was sent out when firefighters reported that "chemicals in a dumpster adjacent to the former Pool Doctor-Beaver Alkali Products site spontaneously combusted," causing "another strong chlorine release."<sup>9</sup>

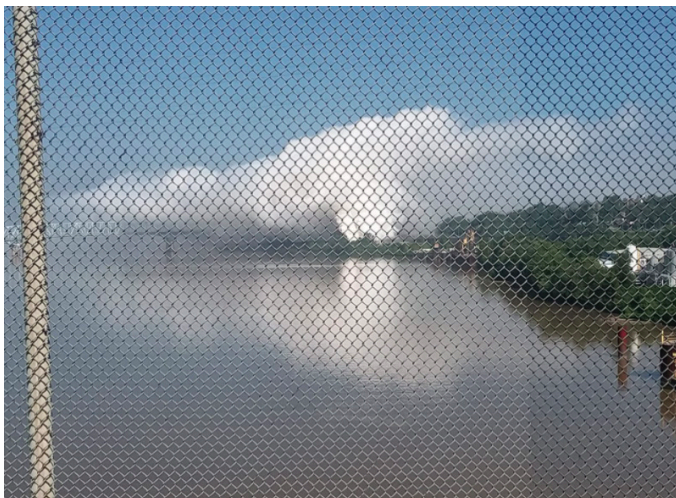


(Photo taken near 713 Virginia Ave, Rochester; credit: Nicole Farris)

This second reaction produced a strong chlorine odor that was "reported in Conway, just north of the Northern Lights Shopping Center, and across the Ohio River in Center Township and Monaca."<sup>10</sup> The Monaca Fire Department posted on their social media that Beaver County had re-issued a shelter in place "due to the chemical fire in Rochester is burning again and is worse than fire in early morning hours of this morning." However, the five-mile shelter-in-place was not reinstated, only a one-mile.

After three more hours of firefighting, at 12:48 p.m. on Saturday, Monaca Fire issued notifications that the orders were lifted again.





Plume from the second chemical reaction on Saturday, July 13. Credit: Nick Musloe

“We found no adverse effects outside of the incident itself,” Mamone said early Saturday. ‘Residents will smell this odor,’ he added, ‘but we’re not picking up anything on the air monitors.’”<sup>11</sup> Chief Mamone also replied over email exchanges that “the hazard never left the hazard area. Air monitoring results at the site were determined to be chlorine. [But] Air monitoring results in the 5 mile radius did not determine to locate any chlorine levels or hazardous conditions for readings.” Mamone underscored his view of the effects over e-mail that read, “My fire report does have that information as I just wrote. It’s my opinion, no residents were harmed by this plume based on the

air monitoring. The area was confined to the Water street areas, where no residential buildings are located.” Commissioner Chairman Daniel Camp expressed a similar view of the incident in stating, “We understand this was a severe event that took place, but if it was a more severe incident, EMS, 911 and Beaver County would have taken additional protocols to alert people.”<sup>12</sup>



HAZMAT workers in Personal Protective Equipment after the chemical reaction on July 12th

## PERSONAL TESTIMONIES

Mr. Greg Muiter, who was impacted by the chemical plume emanating from the Beaver Alkali-Pool Doctor chemical reaction on the morning of July 13, 2019, provided the following eyewitness testimony:<sup>13</sup>

Unfortunately, I was in an open-top vehicle at the time, and I was driving on Route 65 south. And I came to that plume that had just reignited, so it was – to say it was thick was an understatement. It was so thick that I couldn’t see my hands on the steering wheel. And, again, the vehicle was an open top. Think of, like, a Jeep.

So within - really, within minutes, or even seconds, I felt the impacts of the chlorine exposure. My question which I know can’t be answered at this time, is the bromine and what type of bromine was it? (sic). Because a quick search after I just learned there was bromine in that smoke, you know, there’s different types of bromine so I’d be curious to know the answer to that if that could be relayed to me, please?

But within minutes of that exposure, I was shaking, convulsing. My fingertips were numb from my tips up to my elbows. My legs were shaking uncontrollably. My eyes were watering. I had to pull over,

and I called 911. 911 was probably being overwhelmed with calls at that moment. They were very short with me, and when I told them I didn't feel well, they actually basically just hung up on me.

So I continued on down the highway and when I got to my destination, which was Sewickley, I collapsed out of my car to which 911 was called and I was taken to (UPMC) Mercy Hospital.

So I just wanted to go on record as to that was what happened. That's the very short version. I'm truncating a lot of the effects that happened to me afterwards and then I continue to feel. [sic]

Mr. Muiter was not an outlier: many different people were affected by the chemical plumes burning their eyes and lungs. Neighbors who live on Pennsylvania Avenue in Rochester, some of the closest residents to the site of the incident, described a "massive plume of chemicals sitting over their homes, with a cloud so thick they couldn't see the river in front of them or the stop sign at the end of the street." WPXI reported hearing from dozens of people who said they "didn't get emergency alerts about the chemical fire and learned about the shelter-in-place order from watching the news." <sup>14</sup>

Another resident I corresponded with, Natalee Marie, described how the plume affected her the previous day: "Not only could you smell it, but if you were outside . . . this was before anyone knew what was on fire, it burned your lungs and eyes. We weren't notified until the next day. And I was very upset. Mostly because before having gone out myself, I had my dog outside unaware that it wasn't just fog. I also had a window open. I think the notification came in around midnight?"

The deployment of notifications was slow, with over two and a half hours passing between the beginning of the chemical reaction at Pool-Doctor on Friday and the documented time of many residents receiving their first notification to shelter in place.

Resident Torie Elizabeth Ann Kenny was also affected by the plume on Friday. She lives "parallel to the bowling alley, just on the other side of 65," and explained to me that before she left for her night shift, while she did not receive an alert at this time, she brought her child and pet out of the area to her parents' home in Aliquippa. Government Technology Magazine included the story of Resident Jim Woolley of Beaver, who "was upset that he didn't hear anything about the incident until a second chemical release occurred Saturday, when Beaver officials sent alerts out on their borough communication system. He wanted to know why the county didn't post anything sooner." Tracey Lewis, whose apartment is less than one mile away on Brighton Avenue, told me, "My apartment was filled with that gas. Made it hard to breathe." Nick Musloe, who was affected by the incident, shared with me, "I live in downtown Monaca and it was burning our eyes and throat."

Harold McClain, who lives in Monaca directly across the Ohio River from Rochester, said a plume of smoke engulfed the borough and river valley. "This morning I could hardly breathe," he said. "I had a headache. My throat was hurting. It was bad." McLaine evacuated his family to their cottage at Pymatuning Lake. He said police closed the Rochester-Monaca Bridge over the Ohio Saturday after it became shrouded with smoke.<sup>16</sup>

Many people used common sense while experiencing the strong smell of chlorine gas, and if they were physically able to or had a family member or somewhere else to go to, evacuated without understanding the nature of the incident.

As these reports suggest, it is imperative that in the future, residents be made aware of the nature of a public health hazard in a timely manner and enabled to make informed decisions. But in July 2019, Swift911, the county's existing public notification system, proved to be insufficient for that task.

Residents living miles downwind reported smelling the pungent chemical odor, but Rochester Fire Chief Mike Mamone reassured the public that “while residents have detected strong chlorine odors since Friday evening, firefighters have not detected any hazardous chemical levels outside of the site of the release.”<sup>17</sup> The exact levels of chlorine and bromine gas parts per million present and duration have not been publicly disclosed but are presumably included in the Rochester Fire Department’s fire report and testing results. In an interview by WPXI Channel 11 News reporter Lori Houy, Chief Mamone explained that “We put the precaution in place for the Shelter-In-Place, um, was a precaution; we really didn’t need it.”[sic]<sup>18</sup> However, Houy herself “reportedly had to leave the area due to inhaling the fumes” and had to report from neighboring Ambridge.<sup>19</sup>

Speaking for the Rochester department, Chief Mamone told KDKA’s John Shumway that “despite the smell, their testing equipment never detected threatening levels in the air quality.”<sup>20</sup> Yet Lauren Fraley with the Department of Environmental Protection said that “the DEP determined a threat to human health and the environment from the ongoing release of materials and risk to persons entering the buildings.”<sup>21</sup>

## WHAT MADE UP THE PLUME?

Of the two chemical reactions that occurred at the Pool-Doctor site, the first on Friday evening and the second the following morning, both reactions created plumes containing chlorine and bromine. The DEP states that “On July 12, a chemical reaction occurred in the collapsed building, causing a fire that released low levels of chlorine and bromine vapors, creating a plume that hovered at ground level.”<sup>22</sup> On the morning of the 13th, a spontaneous reaction in a dumpster containing chemicals being disposed of on site created a strong chlorine odor.

It is uncertain whether DEP monitored the air quality, or what gases they would have tested for; the Rochester Fire Department monitored for chlorine but has not shared whether the levels were dangerous, or what exactly those levels were - which should be included in their fire report and be available to the public. In the words of KDKA’s Chris Hoffman, “According to the Fire Company, reports indicate that only positive-level chlorine readings were in the fire zone, it could smell like chlorine elsewhere, but those measurable amounts are not being detected.”<sup>23</sup> And John Shumway of KDKA added: “The DEP has air quality monitors out all over the place, and right now they are showing no residual chlorine in the air that would be a threat to people.”<sup>24</sup> However, Stephen Hepler, Air Quality Program Specialist with DEP, contradicted this claim when he replied to me through email exchange that “the Department of Environmental Protection’s air monitoring network does not sample for Bromine/Chlorine.”

The symptom reports of residents may be a better gauge of hazard level given what The National Institutes of Health has to say about chlorine-gas toxicity:

Toxicity to chlorine gas depends on the dose and duration of exposure. At concentrations of 1 to 3 ppm chlorine gas acts as an eye and oral mucous membrane irritant, at 15 ppm there is an onset of pulmonary symptoms, and it can be fatal at 430 ppm within 30 minutes. Because of its strong odor, chlorine gas can be detected easily. Symptoms of chlorine gas exposure include burning of the conjunctiva, throat, and the bronchial tree. Higher concentrations can produce bronchospasm, lower pulmonary injury, and delayed pulmonary edema.<sup>25</sup>

Chlorine and chlorine gas are also part of the Environmental Protection Agency’s definition of hazardous materials:



Hazardous materials containing bromine, chlorine, or fluorine, if subject to combustion or decomposition in a fire environment, may generate irritating and corrosive substances such as hydrogen bromide or hydrobromic acid, hydrogen chloride or hydrochloric acid, or hydrogen fluoride or hydrofluoric acid, and possibly gaseous bromine, chlorine or fluorine themselves.”



Photo via City of Beaver Falls Fire Department

To this description, the EPA adds that “the extremely toxic substance known as phosgene may be formed in some cases when chlorine is present, particularly in combination with oxygen in the chemical molecule, so it is important to check for this possibility in MSDS and other information sources.”<sup>26</sup> Phosgene was used extensively during World War I as a choking (pulmonary) agent, and among the chemicals used in the war, phosgene was responsible for the large majority of deaths. <sup>27</sup>

Chlorine gas was not the only toxic element that residents may have been exposed to. CBS Pittsburgh investigators also confirmed the likely presence of bromine in the plume:

The Department’s assumption that bromine may have been present is based on files retrieved from the site that describe the probable chemical makeup of the material that caused the chemical reaction. According to the files, the material is distributed by Lonza, Inc. and is known as Dantoin. Material product sheets obtained from Lonza’s website state that the active ingredient of Dantoin is 1-bromo-3-chloro-5,5-dimethylhydantoin, consisting of 64.73% Bromine and 28.72% Chlorine. <sup>28</sup>

## **\$3 MILLION CLEANUP COST**

After six weeks the Pool Doctor — Beaver Alkali site cleanup had cost \$375,000, “far more than (the DEP) had anticipated. The cleanup cost would go on to surprise the agency again when it surpassed \$1 million. And by June 2020 the cost to taxpayers was revealed to be \$3 million. <sup>30</sup>

Pointing out the ten-fold increase of a projected cleanup cost is not to criticize the DEP’s efforts to properly dispose of the hazardous chemicals at a site that contained many uncertainties and difficulties. Those difficulties included finding “additional storage areas and stock of hazardous chemicals, as well as drums buried on the property.” It was this work, “coupled with the cost of addressing structural issues in the remaining building,” that cost more than \$3 million.”<sup>31</sup> But it is important to highlight how the cleanup of a relatively small hazardous site exceeded expectations and ultimately cost more than the total fees collected in 2018 for the entirety of Pennsylvania’s Chemical and Planning Fees Interest.

Pennsylvania’s Act 165, commonly referred to as the Hazardous Material Emergency Planning and Response Act, was passed in Pennsylvania in 1990, with amendments added in December, 2000. The purpose of the act is reflected in two especially relevant recommendations:

Establish an emergency notification system whereby the release of hazardous materials occurring at a facility or resulting from a transportation accident will be promptly reported to the Pennsylvania Emergency Management Agency and county emergency management agency. . .

Require persons responsible for the release of hazardous materials to pay the costs incurred by certified hazardous material response teams and supporting paid and volunteer emergency ser-



vice organizations for emergency response activities caused by the hazardous material release.<sup>32</sup>

PEMA has more to say about these costs:

The Commonwealth's Act 165 (The Hazardous Material Emergency Planning and Response Act) funding has seen a decline of 13.3 percent in revenue over the last 10 years with a high of \$1,472,911 in Calendar Year 2009. . . During Calendar Year 2018, the county annual update reports showed a total of \$2,866,805.24 acquired by the counties in chemical and planning fees and interest. This is a 1.74 percent increase over Calendar Year 2017's collection of \$2,816,847.63 in chemical and planning fees by the counties.<sup>33</sup>

Even though the Beaver Alkali-Pool Doctor chemical incident took place at a small pool business, the cost of cleanup was dramatically more expensive than anticipated, and that dramatic exceedance has economic implications if a similar incident were to take place at one of Beaver's industrial-scale chemical facilities. Beaver County is home to Shell Appalachia's sprawling 386-acre plant, BASF Chemicals and NOVA Chemicals. According to EPA's Emergency Response Notification System (ERNS) data, "more than 402,000 accidents involving hazardous chemicals" that were reported across the country in the 12 years between 1987 and 1998 "occurred at industrial and commercial facilities." And the human cost of those incidents is striking: "nearly 4,000 deaths, 25,300 injuries, and 1,400 evacuations affecting 147,000 individuals." <sup>34</sup>

Is it unreasonable for people who work at or live near these plants to want a robust planning effort on their behalf? Industrial chemical facilities are not yet held to the same federal and state emergency preparedness standards as nuclear facilities. But that does not mean they should not be held to those same standards. Nuclear facilities were not always held to the safety and emergency standards that they are now; it took disasters like Union Carbide's mass-murder in Bhopal, India to produce reactive-regulation in the United States in the form of the 1986 Emergency Planning and Community Right-to-Know Act (SARA Title III).<sup>35 36</sup> The 1967 Air Quality Act and 1970 Clean Air Act were put in place only after hundreds of people were killed by breathing toxic air from industry, in specific incidents like the 1948 Donora Smog Disaster and the 1953, 1963 and 1966 New York City Smog Incidents.

Shell Appalachia's ethylene cracker plant that Beaver County is now home to is receiving \$1,600,500,000 (\$1.65 billion) in tax incentives over the next ~20 years. Meanwhile, the annual fees collected by Pennsylvania for its Hazardous Material Emergency Planning and Response Act amount to a mere 1/1,289, or 0.00078% of this total tax-break, and this is for an industry implicated in creating hazardous materials and waste.

Annually, this translates to 0.019% of what a single corporation receives in tax incentives being allocated to Pennsylvania's entire Hazardous Material Emergency Planning and Response Act. Yet we now know the cleanup of a small swimming pool business can cost us \$3,000,000. How does that imbalance make sense?

## QUESTIONS WE ARE LEFT WITH

- What HAZMAT Level was the Doctor Pool chemical plume incident? How was this level determined?
- Why didn't Pool-Doctor/Beaver Alkali operate under any DEP permits? Did this business have to pay annual fees for storing hazardous chemicals? Was the business owner or mortgage holder fined if they were not properly storing and accounting for their hazardous chemicals on-site?
- How was it determined that the hazard had been contained to the immediate site if the smell of chlorine traveled miles away?
- How was air quality tested for specific chemicals like chlorine and bromine, and were they found to be at unsafe levels?
- What was the overall health toll on area residents?
- Why had nothing been done before the chemical reaction took place to remove the hazardous materials?
- Was PEMA notified of this incident? Act 165, Section 206 requires this action:
- PEMA notice–The notification to PEMA shall be made to the PEMA 24-hour response number. This notification shall contain the information required by subsection (b). The notice to PEMA shall fulfill the requirements in SARA, Title III, to notify the council and shall fulfill any requirements in other State laws to notify the Department of Environmental Protection about the same hazardous chemical spill or release. PEMA shall provide notice of the spill or release to the Department of Environmental Protection.
- Were additional notification requirements specified in section 302, 303 and 304 of SARA, Title III followed?
- How much money from Pennsylvania's Hazardous Material Response Fund is allocated to Beaver County?
- How are these funds used? Allocation requirements are specified as follows:
- These funds are to be used for the preparation of chemical emergency plans by local emergency planning committees (LEPCs) and industry, acquisition of hazardous materials response team equipment, public Right-to-Know education, chemical industry awareness and compliance, and the conduct of training and exercises. - PEMA
- How might different townships in our Commonwealth work better together in Emergency Planning & Management?

## RECOMMENDATIONS FOR PUBLIC POLICY

When The Beaver County 911 Centre adopted the Swift911 system in 2015, Eric Brewer, Director of Emergency Services, in commenting on the potential uses of the program, said, "If there is a hazardous-materials incident. . . residents in the area will be notified by the system." Brewer said that only the residents impacted by the emergency would be notified. "We're trying not to cry wolf to the county," he said. "So we're just notifying people in that area."

Swift911, part of SwiftReach, is a commercial software system that can be used for phone call updates, as well as text and email messages.<sup>37</sup> The system was able to sign up tens of thousands of residents and households in Beaver County, but not everyone in the County has been signed up for alerts. Additionally, these alerts are sent out by local townships, but there exists a centralized-County notification system which would have been more useful for a chemical reaction that prompted a 5-mile-radius shelter in place.

To sum up the problems, when the two chemical reactions at the Beaver Alkali pool site occurred, residents who were at risk were sent notifications to shelter in place, but not notified of the nature of the

incident, what to do if gas entered their homes, or where the gas was coming from. Most importantly, not every household in Rochester received these notifications because Swift 911 requires residents to sign up. As one report put it, “About 27,000 residents got notice of a shelter advisory Friday night after a fire at a former pool chemical site emitted pungent chlorine fumes in Rochester, but many residents didn’t receive the notice.” <sup>38</sup>

Moreover, for the residents who did receive the notification, the alert was vague. Commissioner Tony Amadio admitted that “A lot of the problems were because our top two guys were on vacation. So they’re going to meet with their people and do some mediation.” Primarily, though, residents whose health and safety were at risk fell through the cracks because our reverse-911 system required them to be signed up beforehand; and this problem can be solved by taking advantage of a notification system that does not require signing up for.

### 1. Use of Integrated Public Alert & Warning System to supplement reverse-911 alert notifications

While Beaver County’s reverse-911 notification system, Swift911, is a laudable step in communicating emergencies with residents, one of its main drawbacks is that it is an opt-in service, and that fewer than one in three Beaver Countians were signed up to receive alerts at the time of the Rochester chemical reaction(s) in mid-2019. <sup>39</sup>

To supplement Beaver County’s existing reverse-911 notification system, FEMA’s Integrated Public Alert & Warning System (IPAWS) should be utilized. IPAWS is “FEMA’s national system for local alerting that provides authenticated emergency and life-saving information to the public through mobile phones using Wireless Emergency Alerts, to radio and television via the Emergency Alert System, and on the National Oceanic and Atmospheric Administration’s Weather Radio.”<sup>40</sup> IPAWS was developed in 2006, and its focus is in modernizing and enhancing the aging Emergency Alert System (EAS).

The more than twenty specific ‘Event Code’ descriptions with IPAWS include the following ones relevant to this report:



Government Alerts, including IPAWS notifications, are automatically turned on for most mobile devices.

HMW – Hazardous Materials Warning A warning of a release of non-radioactive hazardous material (such as a flammable gas, toxic chemical, or biological agent) that may recommend evacuation (for an explosion, fire, or oil spill hazard) or shelter in place (for a toxic fume hazard); SPW – Shelter in Place Warning A warning of an event where the public is recommended to shelter in place (go inside, close doors and windows, turn off air conditioning or heating systems, and turn on the radio or TV for more information). An example is the release of

hazardous materials where toxic fumes or radioactivity may affect designated areas. <sup>41</sup>

In addition to the relative strengths of this emergency-notification program, IPAWS has collaborated with the National Oceanic and Atmospheric Administration (NOAA) to develop a Geo-Targeted Alert System (GTAS). As described by IPAWS, “The map-based GTAS application taps into the administration’s atmospheric condition data to help determine the population impact of a toxic substance release or severe weather event,” and it can “model more than 500 types of hazardous substances and create notification boundaries based on the results.” <sup>42</sup>

The IPAWS application may be particularly well-suited to Beaver County for another reason: Our region’s unique topography and susceptibility to temperature inversions can trap toxic/hazardous chemicals in

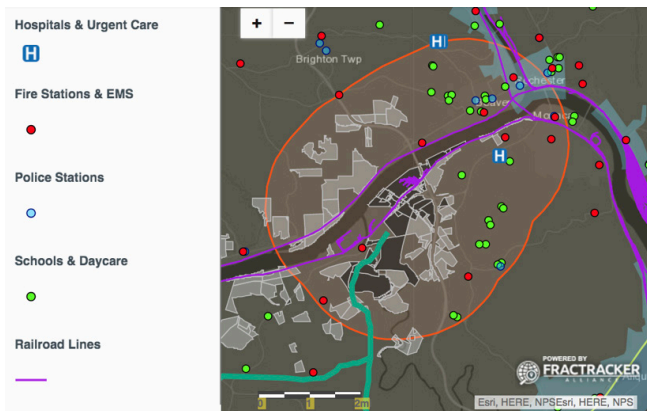
residential areas along our river valleys, and the GTAS application may prove useful for targeted alerts to residents who may be at risk during inversions.

However, the key difference between Swift911, our existing reverse-911 alert system, and the IPAWS system is the requirement to opt-in to receive notifications. It is not acceptable that at the time of the Rochester chlorine-bromine plume incident only 52,000 of 160,000-plus residents of Beaver County had been signed up<sup>43</sup>; and IPAWS would go a long way to close this gap. By default, most mobile phones and devices receive Government Alerts, whereby a notification is broadcast to any person within a given radius (e.g. 10 miles) of an emergency zone. Anyone passing through the area, workers from out-of-state, and residents who have not yet signed up for Swift911 alerts would benefit from the relatively holistic alert system of IPAWS when they would otherwise have fallen through the cracks.

Swift911 may also prove to be more useful in the case of households with only landline phones or mobile phone users with Government Alerts manually turned off. But for the reasons outlined above, these alert systems do not need to be used exclusively and should supplement one another.

One of the glaring problems with emergency response in our Commonwealth is the lack of a unified response, training standards and communication across local fire departments/EMS agencies, of which there are fifty in Beaver County alone. PEMA's Commonwealth Emergency Operations Plan outlines "the organization of emergency response assets at all levels of government in Pennsylvania, and the approach

that will be used to respond to disasters and emergencies of all types"; the operations plan "further prescribes procedures and coordination structures for state-level response, which includes field forces and support by state agencies to local and county responders."



2-mile Emergency Planning Zone for Shell Ethane cracker plant including sites of vulnerability such as schools, railroad lines and hospitals. Source: Fractrackr<sup>50</sup>

## 2. Use of Nuclear Plant Emergency Preparedness Standards for Chemical Plants

In Beaver County, 10-mile-radius evacuation plans and pamphlets are mailed annually to residents who live in the surrounding area of the nuclear plant.<sup>46</sup> This 10-mile-planning zone is the result of regulations. There

are no such requirements for high-risk chemical facilities. Specific chemical emergency programs that Beaver County could adopt are ChemResponder<sup>47</sup> and/or emergency preparedness and evacuation protocol from FEMA's Chemical Stockpile Emergency Preparedness Program.<sup>48</sup> These are programs that allow for proactive steps to mitigate the harm of industrial-chemical disasters. In September 2020, Lancaster County Emergency Management Agency (EMA) and the Lancaster County HAZMAT organizations took the step of improving their chemical emergency preparedness with ChemResponder.<sup>49</sup> It's a step that Beaver County might want to consider taking.



## CONCLUSION

The chemical reactions at Pool-Doctor were ultimately a relatively minor incident. Still, many residents chose to evacuate the area due to chlorine gas burning their eyes and lungs. The plume left at least one driver gasping for breath and dizzy. Having residents that were affected by the plume and only notified hours later to the nature of the incident resulted in unnecessary endangerment for children and pets that were outside, drivers operating their vehicles on the road, and even residents who were inside their homes and may have had their windows open on a summer day.

These chemical reactions occurred at a small business whose owners had been improperly storing and not reporting their hazardous chemicals for years. Most importantly, this incident illuminated failures in our regulatory and emergency planning operations that have implications for future emergency incidents. Crucially, those future incidents could include dangerous chemical releases and/or fires at the industrial chemical plants occupying hundreds of acres of land along our riverbank, including Shell Appalachia's rising Polymers Complex. The Shell plant's classification by the Cybersecurity and Infrastructure Security Agency (CISA) as a high-risk industrial chemical facility accentuates the need for regulatory and emergency-planning improvements.

At the local level, a centralized notification system that alerts all the townships at once is possible with IPAWS notifications, a PEMA program that sends alerts to residents without them having to sign up. The existing nuclear-plant evacuation pamphlets can be utilized for high-risk industrial chemical facilities like the Shell petrochemical plant.

Paralleling the local-level policy recommendations of this report, Patrick McDonnell, Secretary of the Department of Environmental Protection (DEP), has used the Rochester chemical-reaction incident to highlight the need for the Restore Pennsylvania program:

"It's hazardous sites like [the Pool Doctor/Beaver Alkali Products site.] that underscore the need for Restore Pennsylvania. . . .When the commonwealth is forced to act in these situations, costs can be significant because of the unknown hazards. We need to fund the last line of defense provided by HSCA, not only to protect the environment, but to prevent the deterioration of our communities."<sup>51</sup>

The Pool Doctor - Beaver Alkali Supply incident was a wake-up call to Beaver County. The chemical releases on July 12-13, 2019 make it clear that evacuation plans and proactive steps similar to the measures in place for residents living within a ten-mile radius of the Beaver Valley Nuclear Power Station should be followed by the County's Local Emergency Planning Committee (LEPC). Emergency plans for high-risk chemical facilities, including evacuation routes and/or shelter-in-place recommendations, should mirror the existing nuclear evacuation plans that are mailed to surrounding residents annually. Such a plan is and such steps are imperative for residents who live in the areas surrounding high-risk chemical facilities, including the Shell Appalachia Polymers Complex.

# REFERENCES

1. <https://www.dep.pa.gov/About/Regional/SouthwestRegion/Community%20Information/Pages/Pool-Doctor-%E2%80%93-Beaver-Alkali-Products-Site.aspx>
2. [rent%2520property,of%2520previous%2520owner,%2520Harold%2520W](#)
3. <https://www.dep.pa.gov/About/Regional/SouthwestRegion/Community%20Information/Pages/Pool-Doctor-%E2%80%93-Beaver-Alkali-Products-Site.aspx>
4. <https://www.dep.pa.gov/About/Regional/SouthwestRegion/Community%20Information/Pages/Pool-Doctor-%E2%80%93-Beaver-Alkali-Products-Site.aspx#:~:text=DEP%20identified%20the%20current%20property,of%20previous%20owner%2C%20Harold%20W>
5. <https://isssource.com/chem-fire-forces-shelter-in-place/>
6. <https://www.govtech.com/em/safety/Beaver-County-Pa-Officials-to-Improve-Emergency-Communications.html>
7. <https://pittsburgh.cbslocal.com/2019/07/15/rochester-chlorine-leak-fire-department-of-environmental-protection/>
8. <https://www.timesonline.com/news/20190713/chemical-fire-in-rochester-forces-residents-indoors>
9. <https://isssource.com/chem-fire-forces-shelter-in-place/>
10. <https://www.timesonline.com/news/20190715/county-officials-ems-to-discuss-emergency-notification-system>
11. <https://www.timesonline.com/news/20190713/chemical-fire-in-rochester-forces-residents-indoors>
12. <https://www.timesonline.com/news/20190713/chemical-fire-in-rochester-forces-residents-indoors>
13. <https://www.timesonline.com/news/20190715/county-officials-ems-to-discuss-emergency-notification-system>
14. [http://files.dep.state.pa.us/RegionalResources/SWRO/SWROPortalFiles/Pool\\_Doctor\\_Beaver\\_Alkali\\_Products/Administrative\\_Record/PoolDoctorAdminRecordNo15.pdf](http://files.dep.state.pa.us/RegionalResources/SWRO/SWROPortalFiles/Pool_Doctor_Beaver_Alkali_Products/Administrative_Record/PoolDoctorAdminRecordNo15.pdf)
15. <https://www.wpxi.com/news/top-stories/residents-forced-inside-when-chemical-fire-leaked-chlorine-gas-into-air/966560395/>
16. <https://www.govtech.com/em/safety/Beaver-County-Pa-Officials-to-Improve-Emergency-Communications.html>
17. <https://triblive.com/local/regional/shelter-in-place-ongoing-in-several-beaver-county-towns/>
18. <https://www.timesonline.com/news/20190713/chemical-fire-in-rochester-forces-residents-indoors>
19. [https://youtu.be/WARlrJbLts0 \(1:15-1:25\)](https://youtu.be/WARlrJbLts0 (1:15-1:25))
20. <https://triblive.com/local/regional/shelter-in-place-ongoing-in-several-beaver-county-towns/>
21. [https://www.youtube.com/watch?v=jQR2tTOuMW0 \(1:22-1:29\)](https://www.youtube.com/watch?v=jQR2tTOuMW0 (1:22-1:29))
22. <https://www.timesonline.com/news/20190714/dep-working-to-stabilize-chemicals-that-caused-rochester-fire>
23. [https://www.media.pa.gov/Pages/DEP\\_details.aspx?newsid=1251](https://www.media.pa.gov/Pages/DEP_details.aspx?newsid=1251)
24. [https://youtu.be/zQlqtL6VDN8 \(2:00-2:14\)](https://youtu.be/zQlqtL6VDN8 (2:00-2:14))
25. [https://www.youtube.com/watch?v=jQR2tTOuMW0 \(0:29-0:39\)](https://www.youtube.com/watch?v=jQR2tTOuMW0 (0:29-0:39))
26. <https://www.ncbi.nlm.nih.gov/books/NBK537213/>
27. [https://nepis.epa.gov/Exe/ZyPDF.cgi/10003MK5.PDF?Dockey=10003MK5.PDF \(page 4-12\)](https://nepis.epa.gov/Exe/ZyPDF.cgi/10003MK5.PDF?Dockey=10003MK5.PDF (page 4-12))
28. <https://emergency.cdc.gov/agent/phosgene/basics/facts.asp#:~:text=Phosgene%20was%20used%20extensively%20during,other%20chemicals%20such%20as%20pesticides>
29. [http://files.dep.state.pa.us/RegionalResources/SWRO/SWROPortalFiles/Pool\\_Doctor\\_Beaver\\_Alkali\\_Products/Administrative\\_Record/PoolDoctorAdminRecordNo16.pdf](http://files.dep.state.pa.us/RegionalResources/SWRO/SWROPortalFiles/Pool_Doctor_Beaver_Alkali_Products/Administrative_Record/PoolDoctorAdminRecordNo16.pdf)
30. <https://www.timesonline.com/story/news/local/2020/06/30/state-completes-3-million-rochester-chemical-fire-clean->

[up/42125553/](#)

31. <https://www.ellwoodcityledger.com/news/20190828/cleanup-at-rochester-chemical-fire-site-could-exceed-1-million-take-months-to-finish>
32. <https://www.timesonline.com/story/news/local/2020/06/30/state-completes-3-million-rochester-chemical-fire-clean-up/42125553/>
33. <https://www.legis.state.pa.us/cfdocs/legis/li/uconsCheck.cfm?yr=1990&sessInd=0&act=165>
34. <https://www.pema.pa.gov/Preparedness/Hazardous-Material/Documents/Hazardous-Materials-Annual-Report-2018.pdf>
35. <https://deq.mt.gov/Portals/112/DEQAdmin/DIR/Documents/EPCRA/Chemical%20Emergency%20Preparedness%20and%20Prevention%20Documents%20-%20Compilation.pdf> (page 70)
36. <https://www.luzernecounty.org/208/SARA-Title-III>
37. <https://cen.acs.org/safety/industrial-safety/Community-outreach-35-years-Bhopal/97/i32>
38. <https://www.timesonline.com/article/20150923/News/309239972>
39. <https://www.govtech.com/em/safety/Beaver-County-Pa-Officials-to-Improve-Emergency-Communications.html>
40. <https://www.timesonline.com/news/20190715/county-officials-ems-to-discuss-emergency-notification-system>
41. [https://www.fema.gov/sites/default/files/documents/fema\\_event-codes-glossary\\_02-01-2021.pdf](https://www.fema.gov/sites/default/files/documents/fema_event-codes-glossary_02-01-2021.pdf)
42. [https://www.fema.gov/sites/default/files/documents/fema\\_event-codes-glossary\\_02-01-2021.pdf](https://www.fema.gov/sites/default/files/documents/fema_event-codes-glossary_02-01-2021.pdf)
43. <https://www.govtech.com/em/disaster/Impact-IPAWS-Public-Alerts-Warnings.html>
44. <https://www.timesonline.com/news/20190715/county-officials-ems-to-discuss-emergency-notification-system>
45. [https://wiki.radioreference.com/index.php/Beaver\\_County\\_\(PA\)\\_Fire/EMS\\_IDs](https://wiki.radioreference.com/index.php/Beaver_County_(PA)_Fire/EMS_IDs)
46. <https://www.pema.pa.gov/Preparedness/Planning/Documents/Commonwealth-Emergency-Operations-Plan-2019.pdf>
47. <https://www.morningjournalnews.com/news/local-news/2019/11/guide-details-emergency-response-for-shippingport-nuclear-plant/>
48. [https://www.fema.gov/sites/default/files/2020-07/fema\\_cbrn\\_chemresponder\\_fact-sheet.pdf](https://www.fema.gov/sites/default/files/2020-07/fema_cbrn_chemresponder_fact-sheet.pdf)
49. <https://www.cseppportal.net/SitePages/about-csepp.html>
50. <https://www.chemresponder.net/#about/initiatives/lancaster>
51. <https://www.fractracker.org/2017/02/formula-disaster-ethane-cracker/>
52. [https://www.media.pa.gov/Pages/DEP\\_details.aspx?newsid=1251](https://www.media.pa.gov/Pages/DEP_details.aspx?newsid=1251)