Protect PT
3344 Route 130, PO Box 137
Harrison City, PA 15636

Comments & Proposed Changes to the 2023 Update of the PEMA State Hazard Mitigation Plan

Ernest Szabo, PEMA State Hazard Mitigation Planner
EM Mitigation, Insurance & Resilient Communities (MIRC) Office
Pennsylvania Emergency Management Agency
Room 362, 1310 Elmerton Avenue, Harrisburg, PA, 17110

Tracey Vernon, PP, AICP,
Vernon Land Use, LLC
1490 Armitage Way, Mechanicsburg, PA 17050
Troy D. Truax, AICP, Associate Vice President , Planning Department Director
Michael Baker International
4431 N. Front Street, 2nd Floor, Harrisburg, PA 17110-1709

February 1, 2023

Written Comments by
Protect PT, FracTracker Alliance, Eyes On Shell/BCMAC, Washington County Resident Cathy Lodge

Via email: erszabo@pa.gov, troy.truax@mbakerintl.com, tracey@vernonlanduse.com

Please accept this comment submitted to the PEMA Hazard Mitigation Planning on behalf of the members of our organizations, Protect PT (Penn-Trafford) and FracTracker Alliance, Eyes On Shell/BCMAC, Washington County Resident Cathy Lodge.

Protect PT is committed to ensuring that the safety, security, and quality of life of community members are protected from the adverse effects of unconventional gas development in the Westmoreland and Allegheny County region.

FracTracker Alliance maps, analyzes, and communicates the risks of oil, gas, and petrochemical development to advance just energy alternatives, and has over a decade of experience researching oil and gas development in Pennsylvania. Eyes on Shell, part of

BCMAC, is a group of concerned residents monitoring the impacts of Shell's cracker plant on our health and environment to keep our families safe.

Comments On the Draft Plan

Comments for Section 4.3.22. Environmental Hazard – Conventional Wells

On page **412, *4.3.22.1. Location and Extent.*** This section should include the link to PA DEP's Oil & Gas Mapping Website[1]

This section needs to be updated to include a more accurate number of conventional and unconventional wells. According to former Secretary of DEP David Hess, DEP reports there have now been 202,188 conventional oil and gas wells drilled and 23,130 unconventional shale gas wells permitted in Pennsylvania[2].

On page **417, 4.3.22.2. *Range of Magnitude*.** This section states. "Surface waters and soil are sometimes polluted by brine, a salty wastewater product of oil and gas well drilling, and from oil spills occurring at the drilling site or from a pipeline breach." This statement should include the leaking of brine tanks at the well location. These tanks can also accumulate gas at the top of the tank and if not properly emptied and maintained, can cause environmental damage to local waterways, soil and sources of drinking water. In addition, 25 Pa. Code Section 78.51 et seq. permits pits for temporary containment of fluids (.56), pits for storage of contaminated fluids up to 250,000 gallons each or 500,000 in aggregate (.57), discharge of contaminated fluids by spreading over land, if approved by DEP (.60), disposal of contaminated drill cuttings in pits at the well site (.62), disposal of contaminated waste by spreading around the well site (.63), and oil storage tanks of up to 600 gallons each, or 1,320 gallons in the aggregate at the site (.64).[3] All of these activities and conditions present hazards for first responders,

[1] Pennsylvania Department of Environmental Protection Oil & Gas Mapping. Accessed 21 January 2023 <https://gis.dep.pa.gov/PaOilAndGasMapping/>

[2] PA Environmental Digest Blog. "60 Years Of Fracking, 20 Years Of Shale Gas: Pennsylvania's Oil & Gas Infrastructure Is Hiding In Plain Sight" 17 January 2023. <https://paenvironmentdaily.blogspot.com/2023/01/feature-60-years-of-fracking-20-years.html>

[3] 25 Pa. Code Subchapter C. Environmental Protection Performance Standards

as well as the general public, depending on the individual situation. Additionally, in the last sentence, Westmoreland is spelled incorrectly.

Comments for Section 4.3.22. Environmental Hazard – Gas and Liquid Pipelines

On page **423, *4.3.23.1. Location and Extent.*** This section should include resources to the National Pipeline Mapping System[4].

It should also be noted that where pipelines have been constructed using horizontal directional drilling (HDD) across roadways, subsidence can occur and cause water ponding on roadways, leading to vehicular accidents[5]. HDD can also cause contamination of local waterways by inadvertent returns of drilling mud containing bentonite clay which is harmful to local aquatic life and ecosystems.

On pages **428-429, Table 4.3.23-1 *Pennsylvania Active Pipeline Mileage by County (PHMSA, 2018)*** includes gas transmission and liquid pipelines but lacks information about gathering and distribution lines. Adding this information would drastically increase impact assessment.

Additionally, the plan states, "Two agencies that provide information on the location and extent of pipelines within Pennsylvania are the U.S. Energy Information Administration (EIA) and the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA)" These agencies do not publicly provide the locations and extent of gas distribution and gas gathering pipelines, which encompass over 85% of pipeline mileage in the state. Furthermore, the difference between gathering lines and transmission lines is not clearly defined in the state, allowing these unmapped gathering lines to be as large as transmission lines.

Finally, the plan does not address pigging operations anywhere. Raw natural gas may be transported via trucks once it is removed from the ground at a wellhead. Most often though, gas is moved via pipelines connected at well pads. Pipeline Inspection Gages (Pigs) are a necessary part of moving natural gas through pipelines. Raw natural gas can be saturated with hydrocarbons, carbon dioxide, hydrogen sulfide and water. The gas often goes through a pressure change and temperature drop causing components to condense to a liquid phase. These condensates can then build up along the inside of the pipelines impeding the flow of gas. In order to remove the condensate, pipelines have locations along the route where operators can insert a "pig" device to mechanically launch and clean out the build-up. The pig is received at another location along the pipeline. Pressure must be reduced prior to launching or receiving a pig. Pigging may be needed on a daily, weekly or monthly basis to prevent build-up in gathering and transmission pipelines. It is important for First Responders to know the extent of the pressurized gas itself, as well as the known pollutants associated with the "pigging" releases, not only so they can protect themselves, but they can also protect the public during an emergency event.

On page **427, Figure 4.3.23-4, Major Pipelines of Pennsylvania**, there appears to be a typo to the label of HGL Pipelines, change to HVL. The map will also need to be updated to include new pipelines built between 2018 and 2022.

[4] NPMS Public Viewer. (n.d.) 23 January 2023.< https://pvnpms.phmsa.dot.gov/PublicViewer/>
[5] Trib Total Media. "Lawsuit filed in death of Penn-Trafford baseball star" 22 April 2021. <https://triblive.com/local/westmoreland/lawsuit-filed-in-death-of-penn-trafford-baseball-star/>

On pages **429-430, 4.3.23.2. Range of Magnitude**. This section does not delineate Highly Volatile Liquid Pipelines as a separate category but instead is mentioned in the second to last bullet under the section for liquid petroleum. We suggest a separate paragraph be added. Additionally, the bullet reads, "*Highly volatile liquids are lighter than air and will form a vapor cloud when released to the atmosphere*." **This statement is untrue.** In fact, HVLs contain gasses like ethane, propane, and butane that are heavier than air and can form large vapor clouds, particularly in low-lying areas. The threat of asphyxiation is highly probable, particularly to pets and children who breathe air closer to ground level. Typically these products are used to make plastics therefore odorants are not typically added making the detection of leaks more difficult to identify. HVLs are transmitted through different pipelines than petroleum products such as the Mariner East and the Falcon Pipelines[6]. These types of pipelines should have their own category because they create different magnitudes of risk.

Pipelines carrying flammable gasses, including refrigerated liquids, categorized under Guide 115 of PHMSA's 2020 Emergency Response Guidebook should require a setback of 2,640 ft (.5 mile) measured from the pipeline to the property line of the high-occupancy building/facility.[12] Pipelines carrying flammable liquids, categorized under Guide 128 of PHMSA's 2020 Emergency Response Guidebook shall require a setback of 1,000 ft measured from the pipeline to the property line of the high-occupancy building/facility.

On page 431, the plan states, "In some cases, natural hazard events can cause pipeline failures and/or complicate emergency response activities." We feel the plan should make the connection on page **435.** ***4.3.23.4. Future Occurrence*** that extreme flooding and landslides are expected to increase in the future due to climate change. This increases the likelihood of these events happening more frequently.

Additionally, pigging operations have been found to create hazards to residents living near them. The process of reducing pipeline pressure through venting, blowdowns, and flaring for pigging has exposed residents to harmful volatile organic compounds (VOC) chemicals such as benzene and methane. This exposure could cause potentially irreversible health effects. The serious implications of pigging operations are highlighted in several documents, including a *Pittsburgh Post-Gazette* news article detailing the Agency for Toxic Substances and Disease Registry (ATSDR) Health Consultation of human exposures related to pigging operations in a Washington County, PA community noted the following, "A report by the Agency for Toxic Substances and Disease Registry, a federal health agency that modeled its research on a Washington County site, could bolster the case for installing similar controls — as Pennsylvania environmental regulators are proposing — to curb the release of gasses from facilities known by the odd name of 'pig launchers.'"[7]

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[6] Pipeline Safety Trust. "Hazardous Liquid Pipelines - Basics and Issues" Accessed January 2023. <https://pstrust.org/wp-content/uploads/2015/09/2015-PT-Briefing-Paper-03-HazLiquidBasics.pdf>

[7] *Letter Health Consultation ALOHA Air Modeling of Pigging Operations Near the CARTER IMPOUNDMENT MT PLEASANT TOWNSHIP, WASHINGTON COUNTY, PENNSYLVANIA*. (2017).< https://www.atsdr.cdc.gov/HAC/pha/CarterImpoundment/Carter-Impoundment-LHC-(final)-06-22-2017-508.pdf>

On page **431, 4.3.23.3 *Past Occurrences***. We suggest adding these occurrences and information to the section.

In recent years, poor compliance and lax regulations have led to several severe pipeline incidents. On September 10, 2018, a landslide caused damage to a natural gas pipeline called the Revolution Pipeline in Center Township, Beaver County. The damage released gas which ignited, causing a massive fire that destroyed a home, barn, and multiple cars, wrecked six high-voltage transmission power lines and burned over two acres of land. A Grand Jury deemed that poor regulation and failed compliance with environmental laws contributed to this disaster.

Another troubled pipeline project is the Mariner East Pipeline System. On October 5th, 2021, Pennsylvania Attorney General Josh Shapiro charged Energy Transfer with 48 counts of environmental crimes for its construction of the Mariner East 2 Pipeline, which led to massive spills of industrial waste into waterways, sinkholes, and destroyed drinking water sources. The Mariner East 2 pipeline is a natural gas liquid pipeline, similar to the Falcon Ethane Pipeline System (the Falcon). In February 2019, the then-Secretary of the Pennsylvania Department of Environmental Protection (PA DEP) wrote in a letter to federal regulators: "[The PA DEP] has received what appears to be credible information that sections of Shell's Falcon Pipeline project in western PA, developed for the transportation of ethane liquid, may have been constructed with defective corrosion coating protection," and that "corroded pipes pose a possible threat of product release, landslide, or even explosions."

On October 12, 2022, the PA DEP issued a consent assessment of civil penalty with Shell Pipeline Company for permit violations during construction of the Falcon. These violations caused sediment pollution in waterways, and included the failure to follow permits, abide by its incident response plan, and notify regulators of its many construction issues.

On June 6, 2017, the U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR) published their Letter Health Consultation for Aloha Air Modeling of Pigging Operations near the Carter Impoundment, Mt Pleasant Township, Washington County PA[8]. In this report, homes were found to be in danger of having excessive amounts of VOCs raining down on them during pigging operations at a nearby pig launcher/receiver.

In April 2018 the Department of Justice, the U.S. Environmental Protection Agency[9], and the Pennsylvania Department of Environmental Protection announced a settlement with MarkWest Liberty Midstream Resources, LLC and Ohio Gathering Company, LLC (MarkWest) related to excessive VOC releases.

[8]U.S. Department of Health and Human Services. "ALOHA Air Modeling of Pigging Operations Near the Carter Impoundment" 6 June 2017.
<https://www.atsdr.cdc.gov/HAC/pha/CarterImpoundment/Carter-Impoundment-LHC-(final)-06-22-2017-508.pdf>
[9] U.S. Environmental Protection Agency. "MarkWest Clean Air Act Settlement Information Sheet" April 2018.
<https://www.epa.gov/enforcement/markwest-clean-air-act-settlement-information-sheet>

Photo Caption Left: Washington, PA - MarkWest to pay millions to settle air pollution claims by the federal and state government. (April 2018[10])
Photo Caption Right: Washington, PA - CNX Resources Corporation signed a no-contest plea to criminal violations of the Air Pollution Control Act resulting from an investigation into air quality complaints by a Center for Coalfield Justice member determined to protect her family and community. (December 2021[11])

Furthermore, the ATSDR Health Consultation from June 6, 2017, included the following recommendations:

- "Based on these modeling results at this location, reducing tank pressures and avoiding unfavorable meteorological conditions (e.g., nighttime conditions) results in substantial decreases in the potential for residential exposure to contaminants released during pigging operations. We cannot determine whether exposure to these modeled concentrations has actually occurred. Monitoring data would be required to determine the concentrations of air contaminants at nearby residences while pigging activities are being conducted.
- **ATSDR** concludes that a data gap still exists for assessing acute and chronic exposures to air toxics (such as benzene) at residential locations nearby these operations[12]."

[10] *Pittsburgh Post Gazette.* "MarkWest settles federal air pollution claim, promises to invest millions" 24 April 2018. <https://www.post-gazette.com/business/powersource/2018/04/24/MarkWest-natural-gas-pipeline-settles-federal-air-pollution-claim/stories/201804240102>
[11] Center for Coalfield Justice. "CNX RESOURCES ENTERS INTO PLEA AGREEMENT TO AIR POLLUTION CONTROL ACT VIOLATIONS, COMMITS $30,000 TO SOUTH FRANKLIN TOWNSHIP AND 184 ACRES OF LAND TO ELIZABETH TOWNSHIP" 3 December 2021. <https://centerforcoalfieldjustice.org/2021/12/cnx-resources-enters-into-plea-agreement-to-air-pollution-control-act-violations-commits-30000-to-south-franklin-township-and-184-acres-of-land-to-elizabeth-township/>
[12] U.S. Department of Health and Human Services. "ALOHA Air Modeling of Pigging Operations Near the Carter Impoundment" 6 June 2017. <https://www.atsdr.cdc.gov/HAC/pha/CarterImpoundment/Carter-Impoundment-LHC-(final)-06-22-2017-508.pdf>

And, in an April 2018 federal consent decree resulted in the following:

"The United States and the Pennsylvania Department of Environmental Protection ("PADEP") have filed a complaint against MarkWest for violations of the Clean Air Act and the Pennsylvania Air Pollution Control Act at MarkWest compressor stations and stand-alone pigging facilities in western Pennsylvania and eastern Ohio.

'Pigging operations' are maintenance activities that are performed on a daily, weekly or monthly basis to prevent buildup of natural gas condensates in field gas gathering and transmission pipelines. These operations require a facility to vent and blowdown any pressure in the line prior to removing the device known as a pig used for the maintenance activities, including cleaning the interior of the pipeline from buildup of liquids.

MarkWest failed to apply for, and comply with, the required permits and/or recordkeeping requirements under the Nonattainment New Source Review, Prevention of Significant Deterioration and Title V programs, and the Pennsylvania and Ohio State Implementation Plans, for natural gas pigging and venting activities that released excess VOC emissions.

When fully implemented, EPA estimates that the new controls and requirements would result in emission reductions of 706 tons per year (tpy) of Volatile Organic Compounds (VOCs), and 91.5% annual emission reductions throughout the natural gas gathering system.

This case and settlement is the first to recognize and address the significant non-compliant VOC emissions associated with pigging and maintenance operations in wet gas shale plays, such as the Marcellus and Utica formations."[13] [14]

On pages, **436-439, 4.3.23.6. *State Facility Vulnerability Assessment and Loss Estimation*** states, "*To assess the vulnerability of state-owned or leased facilities and critical infrastructure to pipeline failures, all structures located within one-quarter mile of the major pipelines shown in Figure 4.3.23-4 were identified. The area impacted by a given pipeline incident will depend on the pipeline contents, pipeline diameter and operating pressure, and atmospheric conditions. For this assessment, however, one-quarter mile was selected as a representative distance within which death, injury, or significant property damage could occur.*" We suggest that the distance be increased to show the true zone of vulnerability for Hazardous Volatile Liquid pipelines as these pipelines have a much different Projected Impact Radius (PIR) according to most current risk assessment data[15]. Due to the population and facility density this section as well as the next section on *Jurisdictional Vulnerability Assessment and Loss Estimation* should use risk assessment data to estimate PIR along these pipelines, the number

[13] U.S. Department of Health and Human Services. "ALOHA Air Modeling of Pigging Operations Near the Carter Impoundment" 6 June 2017.
<https://www.atsdr.cdc.gov/HAC/pha/CarterImpoundment/Carter-Impoundment-LHC-(final)-06-22-2017-508.pdf>
[14] Hazardous Liquid Pipelines - Basics and Issues
[15] Quest Consultants Inc. "Quantitative Risk Analysis for the Mariner East Pipeline" 16 October 2018.
<https://www.uwchlan.com/DocumentCenter/View/376/Citizens-Risk-Assessment-Final-Report>

of structures and population density should reflect real-world conditions to properly plan to mitigate these hazards.

Additionally, this entire **Section 4.3.22. Environmental Hazard – Gas and Liquid Pipelines** doesn't contain any information on valve stations, valve station releases, or pig launchers which have a particular set of hazards at several locations along the pipeline routes. These sites often release hazardous gasses causing air pollution and in some cases radioactive material releases. Environmental Hazards from these facilities could include: air pollution of high levels of VOC exposure, flaring, venting and blowdowns as well as potential water contamination from spills of liquid chemicals from the pipe.

Comments for Section 4.3.25. Environmental Hazard – Unconventional Wells

On page **456,** ***4.3.25.1. Location and Extent.*** This paragraph should include the link to PA DEP's Oil & Gas Mapping Website

On pages **458-459**, **Table 4.3.25-1**. The number of unconventional wells issued and drilled up to the year 2022[16] needs to be amended.

On page **460, Section 4.3.25.2.** ***Range of Magnitude***. This paragraph should include the possibility of PFAS/PFOA known as forever chemicals in oil and gas waste and present at sites, in addition to radium 226 and 228, Replace NORM with TENORM[17]. This paragraph should also include the presence of large water storage enclosures or impoundments on the well pad site that are often large enough to qualify as requiring a dam permit. Such large impoundments risk rupture, and the consequent flooding of neighboring residential and commercial areas. These impoundments can also contain treated water and risk contamination to local waterways. Oil and gas wastes could also pose exposure threats to local responders, site workers, as well as the community at large. In order to ensure proper protections for responders and the communities, the composition of the wastes should be identified in each company's Preparedness, Prevention and Contingency Plans (PPC) as well as their Emergency Response Plans (ERP) for each site.

This section should also identify the hazard of the temporary brine storage tanks and alternative waste management practices available to operators by filing form OG71[18] [19]. Unconventional well sites can store produced water from fracking to await transport to waste facilities. 25 Pa. Code section 78a

[16] PA Department of Environmental Protection. "Office of oil and gas management forms and permits" Accessed January 2023 <Office of Oil and Gas Management Forms and Permits>

[17] U.S. Environmental Protection Agency. "Technologically Enhanced Naturally Occurring Radioactive Materials" Accessed January 2023 <https://www.epa.gov/radiation/tenorm-oil-and-gas-production-wastes>

[18] Harvard T. Chan School of Public Health. "Living near or downwind of unconventional oil and gas development linked with increased risk of early death" 27 January 2022. <https://www.hsph.harvard.edu/news/press-releases/living-near-or-downwind-of-unconventional-oil-and-gas-development-linked-with-increased-risk-of-early-death/>

[19] <https://files.dep.state.pa.us/oilgas/bogm/bogmportalfiles/TechnicalAdvisoryBoard/COGAC/2016/March/Surface%20Activities/Alternative%20Waste%20Management%20Form.pdf>

Section 51, et seq. permits dictate how solid and liquid wastes are separated and stored on the site to prepare for transport or reuse on-site or at other nearby sites. Solidifiers can be used on-site to solidify liquid waste into solid for disposal at residual waste sites. Additionally, small compressor units can be located at the pad and can bring additional hazards and risks to the environment and population. We suggest information on compressor units be added to this plan in this section.[20] Finally, temporary storage tanks of up to 20,000 gallons each may be present on the site (.56), onsite processing of brine, and other fluids, including radioactive waste is permitted under (.58), impoundments and embankments for containment of oil and gas waste are often present (.59a-c), disposal of drill cuttings, including radioactive waste is permitted at well sites through pit or surface spreading (.622, .630, and oil and condensate tanks are also often present at the well sites (.64).[21] These present hazards to first responders as well as to the general community where the well pads are located.

Photo credit, Ted Auch FracTracker Alliance, left Gaia well pad and right, Metis well pad both located in Penn Township, Westmoreland County

On page 463, 4.3.25.5. *Environmental Impacts*. Our suggested wording is, "There are serious water contamination and pollution concerns with unconventional oil and gas wells such as those associated with the Marcellus and Utica Shale. Potential environmental impacts of shale drilling include: surface water depletion and resulting damage to depleted aquatic ecosystems, contaminated surface water and shallow aquifers from hydraulic fracturing fugitive gasses, contamination of groundwater due to the recovery of contaminated hydraulic fracturing fluid, and accumulation of toxic waste and radioactive elements in nearby soil from extraction and treatment[22]. The overall environmental impacts of unconventional oil and gas wells are still being uncovered, as the industry is fairly new and environmental impacts continue to be studied. On a large scale, *American Rivers*, a leading national river conservation organization, placed two of Pennsylvanian's rivers on the list of the top ten Most

[20] https://www.pacodeandbulletin.gov/Display/pacode?file=/secure/pacode/data/025/chapter78a/subchapCtoc.html&d=reduce
[21] 25 Pa. Code Subchapter C. Environmental Protection Performance Standards
[22] Vengosh A, Jackson RB, Warner N, Darrah TH, & Kondash A. (2014) A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States. *Environmental science & technology*, *48*(15), 8334-8348.

Endangered Rivers in America: the Upper Delaware River and the Monongahela River (listed at one and seven, respectively). Both rivers are listed as threatened by natural gas extraction specifically related to the Marcellus Shale. Combined, the water bodies supply drinking water to more than 17 million people.

On page 463, 4.3.25.6. State Vulnerability Assessment and Loss Estimation. States, "To assess the vulnerability of state-owned or leased facilities and critical infrastructure to unconventional wells, all structures located within 1000 yards of active, inactive, or unplugged wells were identified." The 1000 yards should be changed to 1760 yards to be more accurate for this calculation based on previous events. Unconventional well pads are larger in size, and have greater hazards than conventional well pads, by orders of magnitude. Despite the large differences in the hazard, both the conventional and unconventional well sites are measured at 1000 feet. This should be changed to reflect the differences in hazards. Studies have shown that negative health impacts come from living near well pads when airborne contaminants are emitted and are transported downwind exposing the population and increasing mortality[23].

On page 465, of the same section, Table 4.3.25-5 Vulnerability of people and buildings to unconventional wells. The estimated financial losses are far too small. If you take the number of structures and divide them into the estimated dollars lost, the average is calculated to be in the hundreds of dollars. Those figures are far too small for any dwelling house or brick and mortar business space. These figures need to be modified.

Comments for Section 4.3.24. Environmental Hazard – Hazardous Materials Releases

On pages **440-441, 4.3.24.1. *Location and Extent*** should include unconventional oil and gas drilling sites that store and use hazardous materials to the list of potential locations.

Operators may dispose of contaminated material at a well pad under 25 Pa. Code Sec. 78a.62. This should be identified as a potential hazard. The exact language in the current code is: "An owner or operator proposing to dispose of residual waste, including contaminated drill cuttings, in a pit at the well site shall obtain a residual waste pit disposal permit issued under this chapter prior to constructing the waste disposal pit."[24]

Operators may dispose of contaminated waste by spreading the waste over the well site. 25 Pa. Code Section 78a.63 provides: "An owner or operator proposing disposal of residual waste, including contaminated drill cuttings, at the well site by land application shall obtain a residual waste land application permit issued under this chapter prior to land application of the waste."[25]

[23] Harvard T. Chan School of Public Health. "Living near or downwind of unconventional oil and gas development linked with increased risk of early death" 27 January 2022. <Living near or downwind of unconventional oil and gas development linked with increased risk of early death>

[24] 25 Pa. Code § 78a.62. Disposal of residual waste—pits.

[25] 25 Pa. Code § 78a.63. Disposal of residual waste—land application.

These hazards potentially exist at each and every unconventional well pad within the Commonwealth and the responders and the community at-large should be aware of any potential exposure risks.

Hazards Not Covered or Missing Under Environmental Hazards Section of this Plan

While this Hazard Mitigation Plan lists many types of Environmental Hazards, there are several facility types missing under this section that should be added in order to achieve the most comprehensive State Hazard Mitigation Plan.

Environmental Hazards - Oil & Gas Waste Storage & Disposal Facilities

Oil and gas waste storage and disposal facilities in Pennsylvania are becoming a more common land use as the oil and gas industry produces tons of solid and liquid waste that is transported on local roads, rail and barge and stored and disposed of at local sites that may be part of well pad and, in some cases, in a location separate from the well pad. The health and safety of Pennsylvanians is at risk due to a 1,500% increase in the volume of toxic, potentially radioactive waste generated by oil and gas operations between 2003 and 2018. Until legislation in Pennsylvania regulates and classifies oil and gas waste as Hazardous Waste, additional measures must be taken to mitigate hazards to the environment, public health of the population and property asset loss. Oil and gas waste can contain radioactive materials. Of particular concern in Pennsylvania, due is radium-226, which researchers[26] have found 650 times higher where treated conventional oil and gas wastewater was discharged than above. The PA DEP has found levels of radium ranging from 40.5 – 26,600 picocuries per liter when the EPA drinking water limit is just 5. These radioactive materials can cause "anemia, cataracts, fractured teeth, cancer (especially bone cancer), and death" according to the Centers for Disease Control.[27] More than 1,100 sites process fracking waste in multiple states each year at facilities near homes or schools. Most of this waste is also transported on public roads in addition to train and barge on major waterways[28] and sources of public drinking water not only putting above-ground contamination of drinking water at risk but also below-ground sources leading to loss of property values and environmental resources. Waste can be stored in large quantities in tank farms or batteries and none of these hazards are included in this plan.

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[26] Lauer NE, Warner NR, & Vengosh, A. (2018) Sources of radium accumulation in stream sediments near disposal sites in Pennsylvania: implications for disposal of conventional oil and gas wastewater. *Environmental science & technology*, *52*(3), 955-962.

[27] Agency for Toxic Substances and Disease Registry. "Public Health Statements" 2023. <Public Health Statements | ATSDR>

[28] Network of companies looking to move fracking wastewater in barges up and down Pittsburgh's rivers

This plan does not include brownfields that have been created by the development of shale gas extraction. We feel the plan should include information about brownfield-contaminated soil sites created by conventional and unconventional oil and gas drilling.

On August 24, 2022, the former Secretary of PA DEP reported that "Conventional and unconventional oil and gas drillers have notified DEP they are in the process of cleaning up soil and water contaminated with carcinogenic, mutagenic, neurotoxic and other chemicals harmful to human health and aquatic life found in drilling wastewater and other waste at 272 locations across Pennsylvania."[29]

More needs to be included in the plan that addresses the hazardous waste stream that shale gas development creates. Marcellus waste found on sites in Washington County contained radioactive material. Many landfills in PA accept Marcellus shale waste possibly with radioactive material present.

In July 2021, PA DEP announced they will require all landfills accepting fracking solid waste to test the waste for radioactivity. This includes liquid and leachate. Leachate is formed when rainwater filters through landfill waste creating liquid waste. PA DEP action came after a Fayette County waste treatment plant found high levels of shale gas contaminants in the liquid waste.

Also, the Westmoreland Sanitary Landfill which the shale gas industry has disposed of around 160,000 tons of mud, drill cuttings and various fracking waste in 2018 had leachate flowing downhill into the sewer. This eventually made its way to the Belle Vernon Municipal Authority's treatment plant.

According to an October 13, 2020, PennFuture article, "The authority reported that the leachate was killing bacteria intended to treat wastewater.[30] Tests of the Monongahela River near the plant showed levels of radium at 8 picocuries per liter. The EPA standard for drinking water is 5."[31] According to a State Impact article, "In 2020, state records show oil and gas drillers sent 244,000 tons of drill cuttings to landfills."[32] Additionally, after Pennsylvania Attorney General Josh Shapiro's grand jury report came out in 2020, he was quoted as saying: "Pennsylvanians living next to landfills and in the shadow of fracking wells have a constitutional right to clean air and pure water, and the improved monitoring and promised analysis by DEP is a step in the right direction,"[33]

[29] Creating New Brownfields: Oil & Gas Well Drillers Notified DEP They Are Cleaning Up Soil & Water Contaminated With Chemicals Harmful To Human Health, Aquatic Life At 272 Locations In PA

[30] Joint Conservation Committee: Belle Vernon Municipal Authority Taking A Stand Against Pollution From Drilling Waste

[31] Toxic Fracking Waste Becomes Mounting Problem for Downstream Communities

[32] DEP to require landfills to test for radioactivity from fracking waste | StateImpact Pennsylvania

[33] https://bobscaping.com/2022/09/18/add-another-chapter-to-the-stuck-on-stupid-marcellus-shale-saga/

Photos: Radioactive fracking waste on a Washington County, PA well pad

Environmental Hazards - Petrochemical & Oil & Gas Related Plants & Facilities

Fracking has opened up access to natural gas liquids in Pennsylvania. Natural gas liquids are hydrocarbons like ethane, propane, and butane, and can be converted into petrochemical products, like plastic, paints, lacquers, adhesives, dyes, explosives, and other synthetic materials. In recent years, new infrastructure has been built or proposed in Pennsylvania to support the petrochemical industry. This includes Shell Polymers Monaca, which produces polyethylene plastic from ethane gas. This site began operations in November 2022, and has already reported over 40 malfunctions[34] to the Pennsylvania Department of Environmental Protection, and received multiple violations[35], including one for

[34] Pittsburgh Post-Gazette. "Flaring emissions dominate pollution from Beaver County's Shell Plant" 22 January 2023. <https://www.post-gazette.com/business/powersource/2023/01/22/shell-petrochemical-complex-flaring-potter-township-beaver-county-emergency-measure/stories/202301220130>

[35] Pennsylvania Department of Environmental Protection. "Shell Chemical Appalachia LLC Petrochemicals Complex, Beaver County" 2023. <https://www.dep.pa.gov/About/Regional/SouthwestRegion/Community%20Information/Pages/Shell-Petrochemical-Complex-.aspx>

exceeding its 12-month emission limitation. EIP Oil and Gas Watch information on the, PA Shell Cracker Plant, Monaca PA[36]

[36] *Oil and Gas Watch | {{ $root.page.title || "Home" }}*. (n.d.). 27 January 23.< https://oilandgaswatch.org/facility/1006>

Gas processing plants and natural gas liquids pipelines have also been recently built in the area to support this industry. Some of those facilities include the following:

- Energy Transfer Revolution Cryogenic Gas Plant, Bulger PA[37]
- MarkWest Energy Harmon Creek Cryogenic Plant, Bulger PA[38]
- Scientific Gasses Corporation, Berwyn PA
- MarkWest Bluestone Gas Processing PA, Evans City PA
- MarkWest Houston Plant, Houston, Washington PA[39]

Petrochemical facilities are major sources of air, water, and soil pollution, and as large industrial facilities that handle flammable materials, petrochemical facilities are at risk of explosion[40].The possibility for emergency incidents and "plant upsets" (forced shutdowns caused by mechanical problems, power outages or some other unplanned event) can release sizable amounts of toxic pollutants, seriously threatening public health and safety.

Many industrial accidents at petrochemical sites in the industry's Gulf South hub can be attributed to inadequate enforcement of environmental and safety regulations as companies are largely self-policing operations. Another factor impeding safety is the industry's lack of transparency. Oftentimes, emergency management personnel are not informed about what type of chemicals are stored on industrial sites. They're also often not consulted in the permit approval process – leaving out the expertise of those who best understand a community's safety needs.

Midstream operations are critical anchors between shale gas extraction and the transportation and market distribution of by-products like ethane, butane and propane. Through a series of pipelines and transmission facilities gas is moved from well sites to midstream facilities where water and wastes are removed and the gas is compressed and liquified in preparation for other downstream markets. Midstream operations include compressor stations - sometimes stand-alone and other times located on well pads - as well as gas processing plants.

[37] Oil and Gas Watch | {{ $root.page.title || "Home" }}. (n.d.-b). 27 January 23.<https://oilandgaswatch.org/facility/1033>
[38] *Oil and Gas Watch | {{ $root.page.title || "Home" }}*. (n.d.-c). 27 January 2023.< https://oilandgaswatch.org/facility/895>
[39] *Oil and Gas Watch | {{ $root.page.title || "Home" }}*. (n.d.-d). 27 January 2023.< https://oilandgaswatch.org/facility/4478>
[40] *Oil and Gas Watch | {{ $root.page.title || "Home" }}*. (n.d.-e). 27 January 2023.< https://oilandgaswatch.org/>

Photo Caption: MarkWest Houston 519 gas processing plant - part of the midstream operations in the region that provide fractionation and cryogenic processes of shale gas.

As the number of supporting operations like compressor stations and gas processing plants continues to grow, so do the dangers to local communities. For example, Christmas Day 2022 brought with it an explosion and fire at the Energy Transfer Revolution another gas processing plant in Washington County, PA. Little to no information has yet to be shared with the public - the only known facts are those provided in news reports and the PA Department of Environmental Protection (PA DEP) Inspection Report from nine days after the event.

Photo Caption: 2018 marked another explosion at the MarkWest Houston 519 fractionation/cryogenic plant in Chartiers Township. Not only was there damage to the plant, but sadly, one worker was killed as a result of the explosion.[41]

[41] Post-Gazette, P. (2018, December 19). *Worker in MarkWest fire dies from injuries*. Pittsburgh Post-Gazette. <https://www.post-gazette.com/local/washington/2018/12/19/Jeffery-Fisher-MarkWest-fire-gas-explosion-Houston-Pennsylvania-dies-injuries/stories/201812190181>

These explosions demonstrate the inherent dangers associated with the oil and gas buildout, particularly the midstream operations like gas processing plants. Because such events have already occurred, it is imperative the Hazards Mitigation Plans include emergency protocols for properly addressing risks posed by these operations in order to better protect responders, plant workers and community members.

New Federal Reporting Requirements Bring Further Disclosures: As of November 2021, the United States Environmental Protection Agency (US EPA) has added natural gas processing facilities to the scope of the industrial sectors covered by the national Toxics Release Inventory, commonly known as TRI. This newly revised federal reporting requirement includes all natural gas processing facilities that receive and refine natural gas. Natural gas processing facilities that primarily recover sulfur from natural gas were already covered by TRI. Facilities primarily engaged in natural gas extraction (e.g., exploration, fracking, etc.) are not included in this rule.

Adding these facilities to the TRI will increase the publicly available information on chemical releases and other waste management activities of TRI-listed chemicals from the natural gas processing sector, which furthers the goals of Section 313 of the Emergency Planning and Community Right-to-Know Act. **And as these disclosures become required federal reporting it makes sense these facilities and their disclosed pollutants should be included in the Hazards Mitigation Plan[42].**

Background on the rule change:

- On October 24, 2012, the Environmental Integrity Project (EIP), together with 18 other organizations submitted a petition to EPA, requesting that EPA exercise its discretionary TRI sector addition authority to add the Oil and Gas Extraction sector to the scope of industrial sectors covered by the TRI. On October 22, 2015, EPA granted the portion of the petition requesting that EPA begin the rulemaking process to add natural gas processing facilities to the scope of TRI.
- On January 6, 2017, EPA published a proposed rule to add natural gas processing facilities to the scope of industry sectors required to report to the TRI[43].

[42] *Addition of Natural Gas Processing Facilities to the Toxics Release Inventory Final Rule*. (2022, November 3). US EPA. <https://www.epa.gov/toxics-release-inventory-tri-program/addition-natural-gas-processing-facilities-toxics-release>
[43] *Environmental Integrity Search Results toxics release inventory*. (2017, January 6). <https://environmentalintegrity.org/?s=toxics+release+inventory>

Hazards associated with power plants are not addressed in this iteration or the 2018 iteration of the Hazard Mitigation Plan.

Pennsylvania Power Plants:[44]
CPV Fairview Energy Center, Johnstown PA (gas)
Keystone Power Plant, Shelocta, PA (coal)
Hatfield Power Plant, Carmichaels PA (coal)
Tenaska Power Plant, Smithton PA (gas)
Seward Power Plant, New Florence PA (coal)
Lackawanna Energy Center, Jessup PA (coal)
Homer City Generating Station, Homer City (coal)
NRG New Castle Generating Station, New Castle PA (coal, converted to gas)
Conemaugh Generating Station New Florence PA (coal)
Brunner Island Steam Electric Station, York Haven PA (coal and gas)
Panda Patriot Power Plant, Montgomery PA (gas)
Hickory Run Energy Station, New Castle Pa (gas)
Martins Creek Power Plant, Bangor PA (gas and oil)
Calpine Power Plant, Delta PA (gas)
Montour Power Plant, Washingtonville PA (coal fired)
Calpine Bethlehem Energy Center, Bethlehem PA (gas)
Shawville Generating Station, Woodland PA (coal)

Additional References:

1. Dragon Pipeline Diary's blog post, Sunoco's "integrity management plan" violates the risk assessment requirements of federal law
2. Protective Buffers Recommended Setbacks
3. Dr. Sahu's report on risk assessment of Drakulic well pad
4. Shell Chemical Appalachia LLC Risk Management Plan for Beaver Cracker Plan
5. Soil contamination report from truck accident spilling drill cuttings on local a road in Westmoreland County
6. Fracking with Forever Chemicals

[44] Fractracker Alliance. National Energy and Petrochemical Map. Accessed January 2023. <https://ft.maps.arcgis.com/apps/webappviewer/index.html?appid=0cdff7e116c0425fa55d1226e9204477>

Input on 2018 Hazard Mitigation Actions

ACTION DESCRIPTION	HAZARD	LEAD/SUPPORT AGENCY	FUNDING SOURCE	TARGET COMPLETION DATE	MEASURE OF SUCCESS
Objective 1-11: Support the Department of Environmental Protection in addressing hazards associated with shale gas formation extraction and distribution.					
Action 1-11a. Identify mitigation options for identified impacts and consequences associated with shale gas formation extraction and distribution.	Environmental Hazard - Unconventional Oil and Gas Wells	DEP; PEMA; Counties impacted by shale gas formation extraction and distribution; PUC; ~~PennDOT~~; Oil and Gas Industry	Act 13 impact fee	Ongoing	Address impacts as wells are permitted/drilled.
Action 1-11b. Encourage attendance at training courses that enable counties and local governments to mitigate the negative impacts of shale gas formation extraction and distribution.	Environmental Hazard - Unconventional Oil and Gas Wells; Environmental Hazard - Gas and Liquid Pipelines	DEP; Office of State Fire Commissioner and Academy; Partnerships with private sector; Counties impacted by Marcellus Shale; Universities	Act 13 impact fee	Ongoing	Promote Office of State Fire Commissioner well drilling training and promote US Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety (US DOTPHMSA OPS) training webinars as appropriate.

ACTION DESCRIPTION	HAZARD	LEAD/SUPPORT AGENCY	FUNDING SOURCE	TARGET COMPLETION DATE	MEASURE OF SUCCESS
Action 1-11d: Promote awareness of new pipeline safety guidelines enacted as part of passage of PA Act 50 of 2017.	Environmental Hazard - Gas and Liquid Pipelines	PUC; DEP; PA One Call	Staff time	Ongoing	Include PA One Call and PA Act 50 as a topic in PEMA sponsored conferences.
NEW ACTION Conduct an evaluation of state legislation and policy pertaining to shale gas formation extraction and distribution to mitigate risks.	Environmental Hazard - Unconventional Oil and Gas Wells; Environmental Hazard - Gas and Liquid Pipelines, Environmental Hazards-Petrochemical & Oil & Gas Related Plants & Facilities	State Representatives and Senators, Environmental Quality Board, DEP, Office of State Fire Commissioner and Academy; Counties impacted shale gas facilities; Universities	Act 13 impact fee	2024	Increase in state setback requirements by PA DEP.
Additional training for first responders on new facilities in the community never seen before like Petrochemical Plants, Shell cracker plant	Environmental Hazards-Petrochemical & Oil & Gas Related Plants & Facilities	DEP; Office of State Fire Commissioner and Academy; Counties impacted Petrochemical Facilities; Universities	Act 13 impact fee	Ongoing	New training modules created and an increase in attendance of training participation at the county and local level.
Awareness of jurisdictional spill and release issues related to the transportation of Shale Gas Waste by truck, river barges, and rail. This should	Environmental Hazards-Petrochemical & Oil & Gas Related Plants & Facilities	US Coast Guard, DEP, County and Local	Act 13 impact fee	Ongoing	Cradle to grave tracking of oil and gas waste from the drill site to the final location.

ACTION DESCRIPTION	HAZARD	LEAD/SUPPORT AGENCY	FUNDING SOURCE	TARGET COMPLETION DATE	MEASURE OF SUCCESS
include training on the handling of radioactive materials.					
Increase training and equipment related to toxic air emissions with VOC monitors when responding to emergencies at all natural gas facilities such as well pads, pig launchers/receivers, pipelines, compressor stations, processing plants, Cryogenics/Fractionation plants, metering and metering stations.	Environmental Hazard- Unconventional Oil and Gas Development, Environmental Hazard - Gas and Liquid Pipelines	DEP, County and Local	Act 13 impact fee money	Ongoing	Prevention of first responders and resident hospitalization due to exposure.
Individual site-specific PPC and emergency response plans and first responder training on all oil and gas-related facilities updated annually	Environmental Hazard- Unconventional Oil and Gas Development, Environmental Hazard - Gas and Liquid Pipelines, Environmental Hazards- Petrochemical & Oil	DEP, County and Local	Act 13 impact fee money	Ongoing	Prevention of first responders and resident hospitalization due to exposure.

ACTION DESCRIPTION	HAZARD	LEAD/SUPPORT AGENCY	FUNDING SOURCE	TARGET COMPLETION DATE	MEASURE OF SUCCESS
	& Gas Related Plants & Facilities				
Annual review of each operator's (petrochemical and gas processing facilities) TRI federal reporting data, cross referenced with existing PPC and Emergency Response Plans to ensure updated information is available to all responders	Environmental Hazards- Petrochemical & Oil & Gas Related Plants & Facilities	DEP, County and Local	Act 13 impact fee money	Ongoing	Prevention of first responders and resident hospitalization due to exposure.
Call Hazmat Coordinator for all oil and gas related incidents to conduct air monitoring and evaluate chemical exposures to the population.	Environmental Hazard- Unconventional Oil and Gas Development, Environmental Hazard - Gas and Liquid Pipelines, Environmental Hazards- Petrochemical & Oil & Gas Related Plants & Facilities	DEP, County and Local	Act 13 impact fee money	Ongoing	More air monitoring data on chemical exposures related to oil and gas

Contacts of contributors:

Gillian Graber, Protect PT, Executive Director, gillian@protectpt.org, Westmoreland & Allegheny County, 724-392-7023
James Cirilano, Protect PT, Community Advocate, james@protectpt.org, Westmoreland & Allegheny County, 724-392-7023
Cathy Lodge, tophcat@gmail.com, Washington County resident, 412-848-3936
Erica Jackson, info@fractracker.org, Fracktracker Alliance, 717-303-0403
Andie Grey, info@eyesonshell.org, Eyes on Shell-BC/MAC, 724-923-3244

Thank you very much for the opportunity to comment on this important plan.

Kind regards,

Gillian Graber
Director, Protect PT
gillian@protectpt.org

Send to:
Consultants:
Troy Truax troy.truax@mbakerintl.com
Tracey Vernon tracey@vernonlanduse.com

CC: Ernest Szabo erszabo@pa.gov