

Blackout

in the Gas Patch CASE STUDY



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CARTER IMPOUNDMENT MCDONALD, WASHINGTON COUNTY, PA

Summary

Not long after the Cowden Unit and Drugmand Unit well sites were developed in McDonald, residents living near the sites started experiencing a range of new health symptoms, including sinus and respiratory problems, weakness, fatigue, skin rashes, and headaches. Initially, the most likely source of these problems seemed to be the drilling and completion of the wells, processes that can release significant emissions into the air over a relatively short period of time.

Then residents found themselves faced with a 13.5 million-gallon impoundment. The operator, Range Resources, originally proposed it as a freshwater storage facility servicing the Cowden Unit and Drugmand Unit wells. But over time, the Carter Impoundment became a storage facility for contaminated wastewater and fluids trucked in from over 190 wells in a dozen townships.¹

From the beginning, there were irregularities with the permitting process and problems at the site. Despite ongoing resident complaints, the Department of Environmental Protection (DEP) has issued only one violation to date for the Carter Impoundment (and none for the Cowden Unit or Drugmand Unit wells). As detailed in the events timeline below, DEP seems to have given the operator, Range Resources, “the benefit of the doubt” about what occurred at the site and to question the validity of residents’ complaints.

It is difficult to know whether more careful permitting review and stronger DEP oversight and enforcement actions would have prevented the problems experienced by nearby residents. But it is very clear that DEP never questioned whether having a very large impoundment close to people’s home—and later allowing it to become a centralized waste facility for the region—would pose a risk to their health and well-being, and did not take any action to prevent that from happening.

PHOTOS

ABOVE: Carter impoundment site. Photo by Nadia Steinzor/Earthworks

BELOW LEFT – RIGHT:

Cowden Unit well site Washington County. Photo by Nadia Steinzor/Earthworks

Tanks venting. Photo by Frank Finan

An impoundment under construction. Photo by Frank Finan



Changing Uses, Same Permit

According to the June 2009 application for an expedited erosion and sedimentation control permit for the Cowden Unit and Drugmand Unit well sites, Range Resources planned to build the Carter Impoundment to provide “water storage for use in hydraulically fracturing Marcellus Shale gas wells.” According to a construction activity report, the impoundment was fully constructed and lined by January 15, 2010.

About one week later, Range submitted an application to DEP for a dam permit for the Carter Centralized Impoundment. It’s unclear whether this was because Range changed its plans and wanted to have a larger facility, or if DEP may have brought this permitting lapse to the company’s attention.

In both the dam permit application and subsequent correspondence with DEP, Range noted that impoundment construction was “in progress” before the application was submitted, as well as including the date construction was completed in the project narrative. DEP then issued the dam permit at the end of March 2010—more than two months after the impoundment had already been built.

On the dam permit application, Range’s Regulatory and Environmental Manager indicated that the impoundment would hold freshwater and fracturing fluids; but in a letter to DEP submitted with the application, the same employee wrote that it would be used for “the collection/storage of flowback water” (i.e., wastewater) from hydraulically fracturing gas wells.

Range’s intention to store waste was confirmed in a summary of the company’s permit application for the Carter Impoundment posted in the Pennsylvania Bulletin (found in a file review), which stated the facility would be used “to collect and store flowback water for the use and re-use of hydraulic fracturing water.” In addition, in August 2011, DEP issued a waiver to allow alternative waste management practices (known as an OG71 form), on which Range indicated that the chemical treatment of waste would occur at the site.

Despite these clear indications that waste would be processed at the site, DEP didn’t require Range to obtain a Waste Management General Recycling 123 (WMGR123) permit, which covers “Processing, transfer and beneficial use of oil and gas liquid waste to develop or hydraulically fracture an oil or gas well.”² One of the operating conditions for a WMGR123 is that activities “shall not harm or present a threat of harm to the health, safety, or welfare of the people or environment of this Commonwealth.” DEP confirmed that the agency currently requires WMGR123 permits for the processing of wastewater at centralized impoundments—but didn’t always do so in the past.

It also doesn’t appear that DEP ever required Range to submit new technical information when the intended and actual use of the impoundment changed. Nor did DEP take any action to hold the operator accountable for seeking a dam permit “after the fact,” when the dam in question was already constructed.

These permitting issues raise significant questions about whether the originally proposed dimensions, construction standards, and measures for leak control and detection and erosion and sedimentation control were sufficient for a centralized waste impoundment. Dam permit standards were developed for freshwater impoundments and are less stringent than those for wastewater storage—but for several



years, DEP has been applying them to wastewater impoundments by virtue of requiring the same type of permit.³

Events timeline for the Carter Impoundment and Cowden Unit and Drugmand Unit well sites

The following events have been compiled from DEP inspection reports and other documents available through file reviews, records in the Oil and Gas Compliance Database, and other information provided by residents. Given that some inspection reports were missing from files and other documents are unavailable to the public, this timeline is not necessarily complete.

Date	Event
11/29/09	Cowden Unit 1H well: DEP conducts an inspection in response to a complaint about loud noise and “odor that made them nauseous.” The inspector noted, “I found no odors or noise when I visited the site,” that the complainant agreed the odors were now gone, Range employees on site denied their operations were the cause, and the company “said they would investigate.”
5/12/10	Resident’s well water tested by DEP. This may have been in response to a complaint inspection conducted on March 4 for the Drugmand Unit 3H well; however, the report was missing from the well files and DEP denied our request to see it filed through Pennsylvania’s Right-to-Know Law (RTKL).
8/23/10	Cowden Unit 1H & 2H: A well restoration report indicates that a 150x75x10 foot pit containing drill cuttings, cement returns, and frac sand was encapsulated in a 20 mil liner and buried onsite.
3/21/11	Carter Impoundment: While transferring frac fluid into the impoundment, the operator spilled 100-150 gallons, which flowed down a hill. DEP was notified and inspected, concluding that, “no waterway was impacted.” Range Resources conducted soil sampling that revealed levels of chloride, sodium, barium, 2-butanone, and petroleum hydrocarbons much higher than in soil unaffected by the spill. Additional soil removal and sampling was done until levels came down. Almost 84 tons of soil was disposed of at a landfill. DEP issued violations to Range Resources for failing to properly store, transport, process, dispose, or control residual or industrial waste and to prevent pollution of the waters of the Commonwealth. Range paid a penalty of \$59,000 as part of a consent agreement reached with DEP, which also covered 17 other violations that appear to be unrelated to the Carter Impoundment. ⁴
4/4/11	Carter Impoundment: DEP conducts an inspection in response to an odor complaint 3 days before. The inspector does not detect odors from the Drugmand well site and only “a faint brine type odor” at the impoundment, concluding that because the complainant’s home is downgradient it is possible to experience odors “during specific weather conditions.”
1/11/12	Drugmand Unit well site: A DEP inspection concludes that the site is properly restored. The report notes that the connected Carter Impoundment has not been restored because it is still in use, but that “at the Department’s discretion Range Resources has been permitted to discontinue weekly inspections at the Drugmand well site.”



6/13/12	Carter Impoundment: DEP conducts an inspection in response to a complaint about constant truck traffic and improper use of the impoundment without a waste management permit. Inspector notes that Range doesn't have that permit but has an OG71 waste management waiver from 2011 for chemical treatment of wastewater—and that a Range employee assured him that the impoundment is permitted to accept oil and gas waste.
7/9/12	Cowden Unit & Drugmand Unit well sites: DEP conducts an inspection in response to a complaint from 18 days prior that the "run-off controls installed from the original complaint were no longer working and that there is now erosion on the property." Inspector concludes that the silt sock designed to prevent run-off is breached during heavy storms and is now degraded and that the operator was asked to provide DEP with drainage flow calculations.
7/20/12	Cowden Unit & Drugmand Unit well sites: DEP conducts an inspection in response to a complaint that sediment was running into a stream, noting that the water was clear above the well site's cross-drain, but that a neighbor also had a discharge pipe going in the stream that might be the cause.
8/13/12	Cowden Unit & Drugmand Unit well sites: DEP conducts an inspection in response to "an on-going complaint in which a cross-drain is concentrating flow and is discharging onto the complainant's property." Inspector concludes that the operator is taking some voluntary measures to address the problem, but DEP can't issue a violation because the operator "properly obtained an ESCGP[Erosion and Sedimentation Control] permit through the Department and utilized E&S [Erosion and Sedimentation] controls and BMPs [Best Management Practices]." Also noted is the complainant's request that the cross-drain be moved, but "there is no vehicle for the Department to force the operator to do so," that stormwater had always drained near the home anyway, and the complaint "is considered to be closed at this time." A Range Resources engineering report submitted to DEP in August concludes that while "the construction has created a situation where historical sheet flow...is now concentrated...the additional aggregate surface installed...does not increase the runoff."
9/7/12	Carter Impoundment: DEP complaint records note that "Complainant's property is directly below the fracking pond of the Carter Impoundment and Cowden well. An overflow pipe is 10' from property line and is causing property damage as a result of not using best management practices. Complainant states that the Twp [Township] engineer was on site and admitted that the project was not done correctly." The complaint records do not include the date of or any information on a DEP response.
9/12/12	Drugmand Unit well site and Carter Impoundment: DEP inspector responds to a complaint from five days before about frogs dying nearby and strong odors. The inspector doesn't detect odors and concludes the frog deaths were due to recent chlorination of the complainant's swimming pool. He also inspects erosion near the well site following complaints, concluding that it's due to the complainant's clearing and raking of vegetation around his property and compacted ATV trails.
10/2/12	Carter Impoundment: A DEP inspector is onsite to investigate odor problems, stating in a report that there was a faint odor and a reddish scum/foamy material on the impoundment.
12/3/12	Carter Impoundment: A DEP inspector responds to an odor complaint from two days prior, finding erosion at the site but no odors and noting that work was underway involving the secondary containment systems (for spills and leaks) around storage tanks, which had recently been emptied.



12/13/12	<p>Carter Impoundment: DEP conducts an inspection following notification by a “concerned citizen/complainant alleging that Range Resources has a release/spill.” The inspection report notes that 20 roll off boxes were onsite and soil removal was underway, and reiterates Range’s assertion that they conducted routine “surveillance samples” underneath the tank containment liner and discovered the soil was contaminated.</p> <p>The inspector concluded there was no evidence of a spill but that perhaps “little drips/spills” from hoses and valves had become concentrated in the soil and that ice melt used at the site was the reason for the high chloride levels. No violations were issued. In a March 2013 letter to DEP, Range confirms that “a series of activities” related to the cleaning and removal of tanks had taken place but that “there is no obvious explanation for the elevated readings observed” in the soil.</p>
2/21/13	<p>Carter Impoundment: DEP conducts a complaint inspection and samples water from a homeowner’s spring, noting that it is shallow and “surface water was running...into the drinking water.”</p>
3/18/13	<p>Carter Impoundment: DEP conducts a complaint inspection; the report notes a review of water samples taken in February and concludes, “gas drilling activities did not affect the water quality.”</p>
4/11/13	<p>Carter Impoundment: A DEP complaint record notes “Caller is reporting a strong odor that is coming from the fracking pond that is approximately 200 yards from their residence.” The DEP response notes, “No off site odors were observed. There was a slight petroleum/grease odor on the Southern side of the impoundment.”</p>
6/17/13	<p>Carter Impoundment: A DEP complaint record notes that the complainant has for a few years “noticed on/off odor + discolor in well water. Suspect nearby drilling and/or Carter impoundment may be cause.” The DEP response notes state that water samples taken on 6/19/13 are “comparable [sic] to the pre drill samples on 9/11/09. At this time, the Department’s investigation does not indicate that gas well activities have impacted your water supply.”</p>
8/2/13	<p>Carter Impoundment: A DEP complaint record references a National Response Center (NRC) report that, “Caller reported that a strong chemical odor is coming from a facility.” According to notes on a DEP response the same day, “No offsite odors were detected...The liner of the Carter Impoundment is currently being [sic] of residues from the storage of re-use water. Fresh potable water is being brought onto site via a tanker truck and is being utilized to pressure wash the sides of the impoundment. The remaining material (water mixed with solids) is being put into staged tanks...trucks are hauling the material from the tanks daily to two other sites...for further re-use. Faint and intermittent odors were detectable when standing next to the impoundment along with some emission odors from the diesel vehicles. The operator has installed air monitors around the impoundment—analysis is not yet available but has been requested for review.”</p>

<p>Late 2013-2014</p>	<p>Carter Impoundment: In large part due to continual pressure from local residents, Mt. Pleasant Township brought zoning violations against Range Resources and the impoundment was completely drained.⁵ In May 2014, steel containers used to hold radioactive material appear at the site.⁶ A few weeks later, a West Virginia landfill rejects waste from the impoundment because of high radioactivity levels.⁷ In August 2014, media reports indicated that a Michigan landfill took the radioactive waste from Range Resources operations in Washington County, including the load rejected by West Virginia.⁸</p> <p>DEP denies a resident’s Right-to-Know Law request for inspection reports and soil and air test results related to recent work at the impoundment, citing an exception in the law for “non-criminal investigations.” In August 2014, DEP determined that groundwater and soil had been contaminated by operations at three other Range Resources impoundments in Washington County.⁹ However, the current status of DEP actions related to the Carter facility remains unclear.</p>
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A Clear Source of Pollution

DEP inspection records and reports indicate that the Carter Impoundment has caused problems for nearby residents. According to DEP’s Environment Facility Application Compliance Tracking System (eFACTS) database, 10 out of 18 inspections conducted at the Carter Impoundment between March 2011 and May 2014 were the result of complaints, two were follow-up inspections to complaint inspections, and two were in response to an incident or event.¹⁰ In addition, DEP conducted three routine inspections and one compliance evaluation.¹¹

According to the DEP natural gas emissions inventory, in both 2011 and 2012, the Cowden Unit and Drugmand sites released volatile organic compounds (VOCs) from tanks and fugitive emissions from well infrastructure. (Emissions levels in earlier years can’t be determined due to lack of DEP data). The Carter Impoundment may also have contributed to air pollution, as truck traffic increased and volume of waste stored grew over time. In addition, the impoundment may have released VOCs, which according to a DEP study were detected near another active fracking wastewater impoundment in Washington County.¹²

Earthworks conducted air canister testing at homes near the Cowden and Drugmand well sites and Carter Impoundment in October 2011, May 2012, and August 2013. The largest number of VOCs (13) were detected in the 2011 air samples, despite being done at a time when emissions from wells were not likely to not have been highest (i.e., after drilling and completion had occurred).

Of the 13 VOCs, 11 were the same as those detected by DEP in air samples at a different fracking wastewater impoundment in Washington County.¹³ In addition, the health symptoms reported by residents around that time matched the scientifically established health effects of the detected chemicals. In particular, sinus and respiratory symptoms are associated with the detected chemicals benzene, 2- butanone, chloromethane, ethylbenzene, freon 12, freon 113, methylene chloride, tetrachloroethylene, toluene, 1,2,4-Trimethylbenzene, and xylene.¹⁴



The area where Range Resources proposes to build a tank farm for waste treatment to replace the Carter Impoundment. Homes in this neighborhood are already surrounded by multiple wells, a compressor station, a gas processing facility, and an impoundment. Photo by Robert M. Donnan

A WASTE SHELL GAME

In 2013, Range Resources made an offer to the Mt. Pleasant Township Board of Supervisors: retract all notices of violation pertaining to four local impoundments and the company will close the Carter Impoundment and convert the Nancy Stewart waste impoundment into an aboveground wastewater tank facility.¹⁵ Although the Supervisors rejected this “quid pro quo” approach to waste management, two months later they approved a conditional use permit for the tank facility.¹⁶

Prior to the vote, Earthworks and other environmental organizations sent a letter to the Supervisors and zoning board members urging them to deny the tank facility permit.¹⁷ We argued that the facility would violate the Township zoning laws for the very same reasons that the Carter and other impoundments had: the allowance of an industrial facility in an area zoned for agricultural and residential purposes. In addition, Range had not demonstrated that it could meet the environmental, health, and safety requirements to obtain a state waste management permit for the tank farm—perhaps because the company is currently suing DEP over the permit requirements.¹⁸

There is also reason to believe that a new industrial facility would worsen environmental and health conditions in the area. According to DEP databases, there are three compressor stations and more than 60 unconventional gas wells already drilled or permitted within two miles of the proposed tank farm site. Air quality tests conducted by DEP and Earthworks at nearby homes detected several chemicals, such as benzene, toluene, chloromethane, methylene chloride, and chlorofluorocarbon (CFC)¹¹.

In recent years, events in the area have included an uncontrolled gas release, a tank fire, blowdowns, frequent venting, spills, improper waste management, and soil erosion. Most telling is that residents living in the neighborhood near the potential waste tank site have reported severe odors and noise and health problems such as eye and throat irritation, breathing difficulties, and headaches.

Endnotes

¹ "Joint Stipulation, Range Resources Appalachia, LLC, Appellant, v. Mt. Pleasant Township, Washington County, PA, Appellee, before the Mt. Pleasant Township Zoning Hearing Board, August 13, 2013. Sections D28-29 on Carter Impoundment.

² PADEP, "General Permit WMGR123: Processing and Beneficial Use of Oil and Gas Liquid Waste." http://files.dep.state.pa.us/Waste/Bureau%20of%20Waste%20Management/WasteMgtPortalFiles/SolidWaste/Residual_Waste/GP/WMGR123.pdf.

³ PADEP's permitting of centralized impoundments is less than clear. Standards in Chapter 105 of the Pa. Code were developed for freshwater impoundments, but DEP has been applying them to wastewater impoundments by virtue of requiring the same type of dam permit. At the same time, DEP has applied regulations in the state's Solid Waste Management Act to wastewater impoundments, but recently proposed that new requirements for them be included in oil and gas regulations (Chapter 78 of the Pa. Code). However, this proposal may be illegal because it applies certain well site regulations to centralized impoundments; see comments of PennFuture on proposed rulemaking, 25 Pa. Code Chapter 78, March 14, 2014, www.pennfuture.org/content.aspx?SectionID=381.

⁴ There were two violations related to the Carter Impoundment but the number of violations addressed by payment of the \$59,000 penalty was 19. The DEP database eFACTS contains an entry for these violations that includes the statement: "Please note: the following related enforcement data is accumulated from possibly many different sites/facilities that may be unrelated to the facility for this inspection." See www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleViol.aspx?InspectionID=1975495.

⁵ Emily Petsko, "Mt. Pleasant Supervisors reject Range proposal." Washington Observer-Reporter, September 28, 2013. www.observer-reporter.com/article/20130928/NEWS01/130929340#.U35V91hdU98.

⁶ Don Hopey, "Radioactive water near fracking pond has Mount Pleasant residents worried." Pittsburgh Post-Gazette, May 2, 2014.

⁷ Don Hopey, "West Virginia won't accept additional drilling waste tainted with radioactivity." Pittsburgh Post-Gazette, May 29, 2014.

⁸ Keith Matheny, "Michigan landfill taking other states' radioactive fracking waste." Detroit Free Press, August 19, 2014.

⁹ Don Hopey, "State: Fracking waste tainted groundwater, soil at three Washington County sites." Pittsburgh Post-Gazette, August 6, 2014.

¹⁰ See the eFACTS database entry related to the Carter Impoundment dam permit at www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleSite.aspx?SiteID=729932.

¹¹ We do not have reports for the two most recent "routine" inspections (May 1 and 2, 2014), as they occurred after our file review.

¹² PADEP 2010. Southwest Pa. Marcellus Short-Term Air Sampling Report.

¹³ The DEP study detected 17 chemicals, while our testing at the Carter Impoundment detected 13. There were 11 VOCs found at both the Carter Impoundment and DEP's test site: 1,1,2-trichloro-1,2,2-trifluoroethane; 2-butanone; acetone; benzene; carbon tetrachloride; chlormethane; dichlorodifluoromethane; m&p-xylene; methylene chloride; toluene; and trichlorofluoromethane.

¹⁴ Data and health survey analysis conducted for the report *Gas Patch Roulette: How Shale Gas Development Risks Public Health in Pennsylvania*. Earthworks, 2012. <http://health.earthworksaction.org>.

¹⁵ Emily Petsko, "Mt. Pleasant Supervisors reject Range proposal." Washington Observer-Reporter, September 28, 2013.

¹⁶ Emily Petsko, "Mt. Pleasant approves Marcellus tank pad." Washington Observer-Reporter, December 20, 2013.

¹⁷ Letter from Earthworks and partner organizations to Mt. Pleasant Township Supervisors and Zoning Board Members, December 16, 2013. www.earthworksaction.org/library/detail/range_resources_application_for_a_conditional_use_permit_for_a_wastewater_t#.U35YolhdU98.

¹⁸ See permit appeal case filing at http://ehb.courtapps.com/public/document_shower_pub.php?csNameID=4459.

