A Special Performance Audit

Department of Environmental Protection

DEP's performance in monitoring potential impacts to water quality from shale gas development, 2009 - 2012

COMMONWEALTH OF PENNSYLVANIA
Department of the Auditor General
Bureau of Special Performance Audits

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July 21, 2014

The Honorable Tom Corbett
Governor
Commonwealth of Pennsylvania
Harrisburg, PA 17120

Dear Governor Corbett:

Enclosed is our performance audit of the Department of Environmental Protection (DEP) and its ability to protect water quality in the wake of Pennsylvania's shale gas boom. I want to thank Secretary Abruzzo and his staff for their assistance throughout this audit. Our departments share the same goal, which is to ensure that DEP works efficiently and effectively in monitoring shale gas development—and more importantly—does so in a way that is deserving of the public's trust.

We focused our audit objectives on DEP's monitoring of shale gas development activities as related to DEP's inspection process, DEP's role in responding to complaints, and DEP's monitoring of waste generated from shale gas development activity. While our audit is critical of DEP's performance in these areas, we do not question the dedication of DEP's employees to their mission of protecting the environment. Many of DEP's employees should be commended for their hard work and commitment.

This audit covered the period January 1, 2009, through December 31, 2012, unless otherwise stated, and was conducted under the authority of Sections 402 and 403 of The Fiscal Code and in accordance with generally accepted government auditing standards as issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained meets those standards.

Our audit contains eight findings that detail shortcomings in DEP's efforts related to its regulatory function over the shale gas industry. Specifically, our audit found that DEP did not consistently issue administrative orders to operators who had been determined by DEP after investigation to have adversely impacted water supplies, despite a legal requirement to do so. We also found that DEP did a poor job in communicating its investigation results to citizens who registered complaints with the department. Further, DEP was not always timely in meeting statutory timeframes for response and resolution of complaints it did receive.

We also found significant issues with DEP's complaint tracking system, which is used to monitor all environmental complaints, including oil and gas related complaints. The system was ineffective as it did not provide management with reliable information. Audit testing also revealed that inspection reports posted on DEP's eFACTS system were not always accurate and complete.

Furthermore, we identified issues with DEP's policies related to the complaint handling and inspection processes. The complaint handling policy in effect for most of the audit period was inadequate in that it did not provide instructions specific to shale gas wells and water quality complaints. More troubling was that staff did not consistently comply with the policy thereby impacting DEP's ability to effectively monitor citizens' complaints. DEP's inspection policy was issued 25 years ago—before the era of shale gas—as a statement of policy. Despite considerable shifts in technology and human resource capital, this policy remains in place today. In addition, this policy statement contains a "loop hole," which essentially only requires DEP to conduct inspections as it has the financial and human resources to do so.

With respect to transparency in its monitoring of shale gas development, while DEP is making incremental changes, these changes have failed to keep pace with the industry's expansion and the public's demands. As detailed in our report, accessing DEP data is challenging. DEP must improve how it provides access and conveys reliable information to the public.

Our audit report makes 29 recommendations to improve DEP's operations. While DEP disagreed with all our audit findings, conversely it agreed with the majority of our corresponding recommendations. In fact, DEP disagreed with only 7 of the 29 recommendations. Implementation of these recommendations is critical to ensuring that DEP is prepared to meet its responsibilities for future shale gas development and protecting water quality. Not all of these recommendations apply to DEP; some recommendations will require action by the General Assembly. We will follow up at the appropriate time to determine whether, and to what extent, our recommendations were implemented.

In conclusion, as evidenced by this audit, DEP needs assistance. It is underfunded, understaffed, and does not have the infrastructure in place to meet the continuing demands placed upon the agency by expanded shale gas development. Shale gas development offers significant benefits to our commonwealth and our nation, but these benefits cannot come at the expense of the public's trust, health, and wellbeing. We must collectively find solutions to this challenge so that Pennsylvania is a leader among states in monitoring shale gas development and at the same time, protecting water quality. I am committed to working with you and other partners to ensure this audit begins that discussion.

Sincerely,

Eugene A. DePasquale
Auditor General

cc: Honorable E. Christopher Abruzzo, Secretary, Department of Environmental Protection

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Overall Conclusion

DEP was unprepared to meet the challenges of monitoring shale gas development effectively

In just a few short years, Pennsylvania has become a leader among states in shale gas development. Yet, if Pennsylvania is to be that same leader regarding the effective and efficient monitoring of shale gas development, systematic improvements must occur within the Department of Environmental Protection (DEP).

Shale gas development, while offering many benefits, cannot occur without substantial risk to the environment. These potential environmental impacts can have damaging effects to citizens' quality of life, especially so when the impact affects their water quality. Although the industry is constantly evolving and has made many strides to be much more environmentally-friendly than previous generations, the simple truth remains: shale gas development is an industrial process and accidents will continue to occur.

It is DEP's responsibility to protect the environment from these environmental risks and to ensure that laws and regulations which govern potential impacts to water quality are enforced. Unfortunately, DEP was unprepared to meet these challenges because the rapid expansion of shale gas development has strained DEP, and the agency has failed to keep up with the workload demands placed upon it. Although DEP has tried to make organizational changes to meet the demands and has raised permit fees and penalties so that it has the money to meet its mission, these efforts fell short in ensuring DEP was adequately prepared to monitor shale gas development's boom. Undoubtedly, these shortcomings have eroded the public's trust that DEP will respond to citizen complaints and will consistently hold operators accountable for any impacts resulting from shale gas development and do so in a transparent manner.

As summarized in the *Issues, Effects, and Solutions* section that follows, our performance audit identified eight findings. These findings address the shortcomings we found in how DEP monitored shale gas development, and in particular, how DEP responded to complaints about adverse impacts to water quality. It should be noted that many of these findings were developed as a result of the unprecedented access we had to DEP's files, both electronic and supporting paper-form. Despite this access, we cannot assert that we had full access, as DEP's documentation was, and continues to be, egregiously poor. As such, we caution that there may have been additional findings that we could have developed had better documentation been available.

The commonwealth is at a crossroads; shale gas development will continue to present challenges to an agency that was unprepared and continues to be understaffed and underfunded. New solutions to this problem must be considered. Moving forward, DEP must implement the recommendations we make in this report to become more effective in monitoring the shale gas industry and to provide stronger enforcement of regulatory requirements to protect water quality and to restore the public's trust.

Issues, Effects, and Solutions

Pages 6 to 14

Issue #1 -DEP failed to issue administrative orders. DEP has a statutory mandate to issue an administrative order when it determines that an operator has adversely impacted a water supply. Despite this mandate, in many cases, DEP chose instead to seek voluntary compliance and encouraged operators to work out a solution with affected parties. DEP also used operators' time and financial assistance to complete investigations. In our review of 15 positive determination complaint files, we found that DEP ***issued just one order*** to an operator to restore/replace the adversely impacted water supply.

The effect. While it might make sense from a fiscal standpoint for DEP to push much of the cost of these investigations onto the operators, when DEP fails to consistently use the regulatory tools provided by the Act, DEP risks losing the relevance and authority it holds as a regulator. Stated simply, without fear of a "bite," DEP's "bark" will do little to ensure compliance.

The solution. DEP needs to be a stronger regulator and use its enforcement powers consistently. DEP should always issue a violation and an administrative order to an operator who has adversely impacted a water supply—even if the operator and the complainant have reached a private agreement. Operators should not be allowed to circumvent a violation order by offering settlement agreements.

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Issue #2 - DEP communicated poorly with citizens. In cases where DEP investigated allegations of adverse impacts to water quality from oil and gas activity, DEP did not consistently and effectively provide complainants with clear written investigation results. Further, DEP missed certain key statutory deadlines in investigating these complaints. For example, the Williamsport district resolved complaints within the statutorily required timeframe of 45 days only 34 percent of the time, some went on for months. The Pittsburgh district resolved 76 percent of its complaints within 45 days. DEP cited the complexity of some of its investigations, which may involve extensive testing and specialized isotopic testing, as a reason for missing these deadlines.

The effect. Poor communication results in complainants having confusing and complicated information about their water quality. Water quality investigations that continue for months without a determination are inconsistent with statutory and regulatory provisions and are a serious impediment to complainants' quality of life.

The solution. DEP should ensure that clear and understandable "determination letters" are always issued to complainants in water supply investigations and in a manner that does not allow for misinterpretation. DEP should make every effort to ensure that complaints are investigated and resolved timely. For cases involving stray gas migration, the General Assembly should evaluate if the 45 day requirement is realistic.

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Issue #3 - DEP was unprepared to handle citizen complaints. DEP stated that it tracked all complaints it received about oil and gas activity through its complaint tracking system (CTS), yet this system was unable to generate consistent and reliable data on the nature and total number of complaints DEP received. DEP has tried to patch CTS and improve its procedures for use of CTS, but DEP still cannot use CTS data to reliably answer simple questions like: how many shale gas related complaints were received or how many complaints resulted in a positive determination? We identified six main concerns with CTS data, all of which were a result of DEP's weak controls over complaint management.

The effect. Little of the CTS data can be used to aid DEP's mission, which impacts DEP's ability to identify emerging trends requiring regulatory reform/action. For a complaint that may allege an adverse impact to water quality, if DEP allows the complaint to "fall through the cracks," DEP may be viewed as not taking the complaint seriously, which will erode the public's trust in DEP.

The solution. DEP should develop better controls over how complaints are received, tracked, investigated, and resolved. Complaints are an integral "early warning" to potential problems; therefore, DEP must invest resources into replacing, or significantly upgrading, its complaint management system and procedures to ensure DEP is well equipped to provide the best level of service to the citizens.

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Issue #4 - No assurance that shale gas wells were inspected timely. DEP followed an outdated and ambiguous inspection policy that did not provide any clear criteria for how many times DEP should inspect a well. We attempted to measure DEP's performance in this critical area, but we were stymied by DEP's continual reliance on manual records and limited reliable electronic data. Also, despite adding several oil and gas inspectors to its staff, DEP did not have sufficient resources to manage the increased demands from Pennsylvania's shale gas boom.

The effect. Without a clear inspection schedule, DEP is free to inspect as frequently (or infrequently) as it wishes. Until DEP improves its timeliness and frequency of inspections, it cannot truly fulfill its responsibilities as the state's environmental regulator.

The solution. DEP needs to find the financial resources to hire additional inspectors to meet the demands placed upon the agency. DEP should also implement an inspection policy that outlines explicitly the requirements for timely and frequent inspections.

Issue #5 - Shale waste monitoring needs to improve. DEP monitors shale waste with self-reported data that is neither verified nor quality controlled for accuracy and reliability. A true manifest system would allow waste to be tracked seamlessly from generation to transport to final disposition, and it could be a proactive tool for DEP to ensure waste is properly disposed. DEP has been reactionary—only if a complaint is registered or an accident occurs, does DEP verify that where the waste was generated,

where it was transported, and where it was disposed actually happened. Such an approach is counter-intuitive to being proactive over waste management.

The effect. DEP has little reliable documentation to prove to the public that waste is generated, stored, transported, and disposed of properly and that water quality is protected from this potentially dangerous waste.

The solution. DEP should implement a true manifest system so it can track the waste. DEP needs to be a leader and set the example for other states to follow. In the meantime, DEP needs to be more proactive in ensuring that the waste data it collects is verified and reliable.

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Issue #6 - Transparency and accountability are lacking. Shale gas development is a highly controversial topic, and in today's world of immediate access to government information, DEP should be at the forefront in providing this transparency. Instead, DEP provides a spider web of links to arcane reports on its website. Users are left with a dizzying amount of data, but none of the data is presented in a logical and sensible manner. Worst of all, where DEP could be open and transparent about credible cases of adverse impacts to water supplies, it chooses instead to use an overly strict interpretation of the law and not post any such information.

The effect. Data on shale gas development, which should empower citizens and aid DEP's monitoring, is restricted. Some independent research organizations have become so frustrated with DEP's lack of clear data, that they have created their own publically accessible data sets. With respect to credible cases of water contamination, the public is denied knowing about possible impacts to their water supply.

The solution. DEP needs to reconfigure its website and provide complete and pertinent information in a clear and easily understandable manner. If DEP will not post information on credible cases of contamination to public and private water supplies on its website, the General Assembly should take action to amend the law to require DEP to do so.

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Issue #7 - Information on inspections poorly tracked. Inspections of shale gas facilities are one of the key aspects of DEP's monitoring efforts. By law, DEP is to post certain inspection and any resulting violation information on its website. We found DEP does not post all required information and in testing the data for accuracy, we found errors as high as 25 percent in key data fields. We also found that as many as 76 percent of inspectors' comments were omitted from online inspection reporting.

The effect. The only way for the public to know the full story of what happened during a well site inspection is to make a Right-to-Know Law inquiry or visit the applicable regional office and search for a specific inspection report(s)—some of which may be missing or lost.

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The solution. DEP needs to invest in information technology resources for its inspectors. An all-electronic inspection process should be developed so that inspection information is accurate and timely. Data collection and reporting must improve.

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Issue #8 - Information technology resources are inefficiently used. DEP's oil and gas program is not effectively using current IT resources available to it. The systems are reliant upon inefficient manual procedures, which impede effective and efficient data collection and reporting. DEP relies on contracted vendors (some of which are former DEP employees) for many of its IT-related needs.

The effect. DEP's "knowledge management" is severely limited with regard to having timely, accurate, and reliable data for the management of shale gas development. We found so many inconsistencies with DEP's data that we ultimately determined it to be "not sufficiently reliable."

The solution. DEP needs to more effectively use information technology resources and capture critical data. Then, DEP can develop an IT structure that will ensure its oil and gas program has a strong foundation for the ongoing demands placed upon it.

Moving forward

29 recommendations to improve performance. We made 29 specific recommendations that we expect will assist DEP in making improvements to its monitoring activities related to shale gas development. Our audit report will also be of use to others who have an interest in DEP's monitoring of shale gas, including the General Assembly with its legislative oversight responsibilities and the individual citizens to whom ultimately state government is accountable.

Introduction and Background

This report presents the results of our special performance audit of the Pennsylvania Department of Environmental Protection's (DEP) monitoring activities related to ensuring water quality is protected from shale gas drilling activities.[1] The Department of the Auditor General undertook this audit at the direction of Auditor General DePasquale who made a commitment to citizens that this department would review DEP's ability to protect the quality of drinking water in the wake of the commonwealth's shale gas boom.

As discussed further in Appendix A, *Objectives, Scope, and Methodology*, our audit focused solely on DEP's monitoring role related to ensuring water quality is protected during shale gas development. Other agencies, including the United States Environmental Protection Agency, are currently engaged in a scientific analysis of the impacts to water quality from shale gas development.[2] This performance audit was not an evaluation of whether shale gas drilling is beneficial to the economy, nor was it an evaluation of industry practices or specific operators involved in shale gas development.

How is shale gas development regulated?

While there are numerous federal and state agencies that enforce environmental laws, DEP is the primary state agency charged with enforcing Pennsylvania's laws related to the permitting, financial responsibility, drilling, casing, operating, reporting, plugging, and site restoration requirements for oil and gas wells.

The former "Oil and Gas Act" (Act 223 of 1984, as amended) was effective for most of our audit period.[3] However, in February 2012, Pennsylvania enacted the Chapter on "Oil and

[1] The focus of our audit was primarily on shale gas drilling; however, DEP's monitoring of shale gas drilling activities falls under its "oil and gas program," which includes both conventional and unconventional drilling activities.

[2] The U.S. Environmental Protection Agency (EPA) is currently researching the link between hydraulic fracturing and drinking water resources in a multi-year scientific, peer review study. The EPA is examining shale gas development around five extensive research projects that follow the hydraulic fracturing water cycle, including wastewater treatment and waste disposal. Pennsylvania's shale gas development activity is included in this study.

[3] Repealed 58 P.S. § 601.101 *et seq*.

Gas" within Title 58 through Act 13 of 2012[4] (Act), effective April 16, 2012. One of the major purposes of the Act is to "[p]rotect the natural resources, environmental rights and values secured by the Constitution of Pennsylvania."[5]

The Act expanded DEP's authority over shale gas development, and it established an "impact fee," which all unconventional operators must pay to the commonwealth.[6] Proceeds of the fee are shared between local and state governments. Portions of the Act which would have limited local government's ability to zone shale gas development were overturned in December 2013 by the Pennsylvania Supreme Court.[7]

The Environmental Quality Board (EQB) is responsible for adopting many of the regulations which govern shale gas development. In particular, Chapter 78 of the *Pennsylvania Code*[8] outlines specific protections for water supplies, drilling specifications, erosion and sediment control, and disposal of waste. These regulations were most recently amended in February 2011 and January 2013.[9]

The EQB recently accepted public comment on amendments to Chapter 78, which would strengthen environmental protection at oil and gas facilities, including well pads, freshwater and

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[4] 58 Pa.C.S. § 3201 *et seq*.; the former "Oil and Gas Act," was repealed and placed into the Pennsylvania Consolidated Statutes.

[5] 58 Pa.C.S. § 3202(4); Pa. Const. Art. 1, § 27 (Adopted 1971). *Also see* James May *et al*, "Environmental Rights in State Constitutions," *Widener Law School Legal Studies Research Paper Services*, no. 11-47, pp. 305 – 327, in which it was noted that Pennsylvania is one of only 22 states to have an environmental provision in its state constitution. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1932753.

[6] 58 Pa.C.S. § 3301 *et seq.*

[7] *See Robinson Township et al. v. Commonwealth of Pennsylvania et al.*, 83 A.3d 901 (Pa. 2013). In February 2014, the Pennsylvania Supreme Court denied the Commonwealth's request for reconsideration and remanded the case to the Commonwealth Court for "further factual development and ultimate determination" as to whether other parts of the Act may also be enjoined or stricken. On July 17, 2014, the Commonwealth Court, while upholding some of the challenged provisions of Act 13, including that the Commonwealth had valid reasons for requiring that public water suppliers, but not private water well owners, be notified of drilling-related spills, ruled as unconstitutional those Act 13 provisions that had provided the Public Utility Commission with the authority to review the validity of municipal ordinances regulating oil and gas development.

[8] 25 Pa. Code Chapter 78.

[9] In addition to other amendments made in February 2011, an amendment was made to Section 78.51 (relating to Protection of water supplies) of Chapter 78 (Oil and Gas Wells), 25 Pa. Code § 78.51, and the January 2013 amendments only pertained to Section 78.1 (relating to Definitions) and Section 78.55 (relating to Control and disposal planning; emergency response for unconventional well sites) of Chapter 78, 25 Pa. Code §§ 78.1 and 78.55.

wastewater impoundments, gathering pipelines, and borrow pits.

There are numerous other state and federal environmental laws and regulations which impact shale gas development. Some of these laws are based on federal requirements and affect multiple DEP programs. For example, the Clean Streams Law provides legal authority not only for the oil and gas program, but also for DEP's broader water quality programs and wastewater treatment requirements. (Refer to Appendix B for additional information on federal and state laws and regulations which impact shale gas development.)

How is DEP organized to regulate shale gas development?

The Office of Oil and Gas Management oversees shale gas development activities within the commonwealth. In 2011, the office was reorganized and elevated to a deputate within DEP. Other DEP offices also play a role in the oil and gas program. For example, monitoring of waste generated from drilling operations is the responsibility of DEP's oil and gas program—as long as the waste remains at the well site. When an operator moves the waste material from the well site, then DEP's Bureau of Waste Management has regulatory authority.

Similarly, the Office of Oil and Gas Management has responsibility for ensuring water supplies are not contaminated from drilling operations, but DEP's Bureau of Safe Drinking Water ensures that public water supplies are clean and safe. Perhaps most confusing, DEP has no regulatory authority over the construction and operation of private water wells in the commonwealth; however, DEP must inspect and test a private water well where drilling activities may have contaminated the private water well.

DEP's Bureau of Laboratories performs analytical testing for DEP programs that monitor water quality parameters related to shale gas development. The Bureau of Laboratories' analytical components include, but are not limited to, organic chemistry, inorganic chemistry, microbiological, radiological, and gravimetric testing. This bureau maintains four mobile

laboratories to provide on-site environmental testing throughout the commonwealth.

The Bureau of Laboratories is responsible for providing accreditation to private and commercial laboratories that perform testing related to shale gas development. The Bureau of Laboratories, itself, is fully accredited by the National Environmental Laboratory Accreditation Program (NELAP).

The Office of Oil and Gas Management consists of one Harrisburg-based program office and three district offices, located in Williamsport, Meadville, and Pittsburgh. The Williamsport office covers the eastern and northcentral portions of the state, while the Pittsburgh office covers the southwestern areas of the state, and the Meadville office covers the northwest. The Williamsport and Pittsburgh oil and gas district offices are the offices most directly responsible for shale gas development.

As of March 19, 2013, the most recent information provided by DEP, the staffing level[10] of the Office of Oil and Gas Management was as follows:

Organization	Total	Filled	Vacant
Director	1	1	0
Central Office	23	20	3
Williamsport	50	49	1
Meadville	55	54	1
Pittsburgh	55	48	7
Total	**184**[a/]	**172**	**12**

Notes:
[a] DEP funds an additional 18 positions through the Well Plugging Fund, but these positions are not necessarily assigned to the Office of Oil and Gas Management.
Source: Developed by Department of the Auditor General staff from information provided by DEP.

How does DEP pay for shale gas monitoring?

The oil and gas program, which includes both unconventional and conventional monitoring expenses, is funded by permit

[10] See Finding Seven for more specific information on inspector complement.

fees that are charged to oil and gas operators. Operators must obtain a permit in order to drill oil and gas wells in the commonwealth. These permit fees are placed in a restricted revenue account called the Well Plugging Fund. Other fees collected and deposited into the Well Plugging Fund include fines and penalties, well control emergency recovery costs, and forfeited bond monies.

The Well Plugging Fund also receives an annual transfer of $6 million from the Environmental Stewardship Fund that was initiated by the passage of the Act and is a portion of the annual impact fee. This funding is guaranteed as a portion of the "off the top" disbursements that go to state agencies before other disbursements are made.

The Well Plugging Fund only pays for activities related to oil and gas, including operational and personnel-related expenses, oil and gas specific Bureau of Information Technology expenses, and the Bureau of Laboratories expenses related to oil and gas inspection (testing) activities. According to DEP, the Well Plugging Fund does not pay for any other department programs. The following table shows the revenues and expenses out of the Well Plugging Fund for the past five fiscal years.

Well Plugging Fund
Fiscal year funding status

	2008-09	2009-10	2010-11	2011-12	2012-13
Beginning balance, July 1	$2,844,605	$ 4,096,524	$ 6,384,638	$ 5,836,205	$ 2,975,275
Total Revenues	2,201,583	10,818,255	15,673,248	13,471,420	23,863,502
Less Expenses	(949,664)	(8,530,141)	(16,221,681)	(16,332,350)	(15,745,352)
Ending balance, June 30	$4,096,524	$ 6,384,638	$ 5,836,205	$ 2,975,275	$ 11,093,425

Source: Developed by the Department of the Auditor General from Status of Appropriations reports. We did not conduct an audit of the Well Plugging Fund.

Note: For information on the Marcellus Shale formation, as well as the process used in extracting gas from the Marcellus formation, please see Appendix D.

Finding One → DEP did not routinely and consistently issue orders requiring oil and gas operators to restore/replace adversely impacted water supplies as required by law.

Key points:

- After reviewing a selection of 15 positive determination complaint files, we found that DEP actually ***issued just one order*** to an operator to restore/replace the adversely impacted water supply.
- The law states that DEP "shall issue orders." ***Shall means must.***
- DEP must use its enforcement authority to ensure compliance under the Act, or it stands to lose the relevance and authority it holds as a regulator of shale gas development.

Pennsylvania enacted the Chapter on "Oil and Gas" within Title 58 through Act 13 of 2012[11] (Act). The Act provides DEP with the authority to issue orders requiring operators to restore or replace water supplies that have been adversely impacted from oil and gas activity.[12] Orders refer to "administrative orders," which is an enforcement action given to DEP under the Act, the Pennsylvania Safe Drinking Water Act, and other applicable environmental statutes.[13] Despite having this statutory mandate requiring operators to take action to replace/restore the impacted water supplies, we found that DEP chooses instead to seek voluntary compliance from operators.

The Act states that in cases where DEP has made a "positive" determination, DEP "shall issue orders to the well operator necessary to assure compliance with…[the well operator's statutory mandate to replace/restore the adversely impacted

[11] 58 Pa.C.S. § 3201 *et seq*.; the "Oil and Gas Act," 58 P.S. § 601.101 *et seq.* (Act 223 of 1984),was repealed and placed into the Pennsylvania Consolidated Statutes.

[12] Under 58 Pa.C.S. § 3218(b), "[a] landowner or water purveyor suffering pollution or diminution of a water supply as a result of drilling, alteration or operation of an oil and gas well may so notify the department and request that an investigation be conducted. Within ten days of notification,…[DEP] shall investigate the claim and make a determination within 45 days following notification." A "**positive determination**" is made when DEP concludes that a water supply has been adversely impacted by drilling activity. A "negative determination" is made when DEP finds that a water supply has not been impacted by drilling activity or that a "preponderance of evidence" is lacking to tie the contamination to nearby drilling activity. DEP makes these determinations based on inspections of nearby gas facilities and investigative work, which may include multiple rounds of testing and other geological and hydrological research.

[13] Administrative orders are not the only enforcement action available to DEP. DEP may also enter into consent agreements, suspension or revocation of permit, civil penalties, bond forfeiture, etc., to bring about compliance.

water supply] including orders requiring temporary replacement of a water supply where it was determined that pollution or diminution may be of limited duration."

Further, according to DEP's policy on enforcement actions, administrative orders are to be used:

> …when a site condition creates an existing or imminent danger to health or safety, or is causing, or can be expected to cause, pollution or other environmental damage; or when the operator indicates a failure to comply with a previously cited violation. When the Department investigates a water supply complaint and finds that the operator has affected the water supply by pollution or diminution, or if the Department presumes the well operator to be responsible for pollution, then it will issue such Orders to the well operator as are necessary to assure restoration or replacement of the water supply.[14]

Given the explicit language in the Act, we had expected to find that DEP issued an administrative order to the operator to replace/restore the affected water supply in every case where DEP had made a positive determination. What we found after reviewing a selection of 15 positive determination complaint files was that DEP had issued only one order to restore/replace the adversely impacted water supply.[15]

DEP was inconsistent when dealing with operators who had adversely impacted water supplies.

We asked DEP why it did not issue orders with those positive determinations that were part of our file review.

DEP stated that water supply impact investigations can be complex and may involve multiple rounds of testing before DEP is able to make its determination (positive or negative).

[14] DEP, *Enforcement Actions by DEP's Oil and Gas Management Program*, revised June 25, 2005.
[15] In six of the complaint files, we noted other enforcement actions, but those actions were related to penalties and not specific to water restoration orders. One of the 15 cases involved coal mining; however, DEP's oil and gas program assisted in the response and investigation.

For more complex cases, DEP stated that the investigations may require sophisticated isotopic testing, which can run into tens of thousands of dollars and months of research. In many of these cases, the well operators assist with—and even pick up the costs for—the complaint investigation.[16] In this manner, DEP stated that it believes it is working cooperatively with the well operators to resolve the complaint, and that this approach brings about better compliance, which is DEP's ultimate goal.

DEP officials also noted that operators are sensitive to potential water contamination cases and desire to be "good neighbors." To this end, DEP stated operators have supplied residents with fresh water, drilled new water wells, paid for connections to public drinking supplies, or installed water filtration systems—all without an order from the department requiring the operator to do so. In these situations, DEP claimed that since the operator had willingly taken steps to restore or replace the water supply, an order was unnecessary.

In fact, DEP's policy *Enforcement Actions by DEP's Oil and Gas Management Program* shows DEP's preference for voluntary compliance instead of enforcement actions as follows:

> While voluntary compliance through technical assistance and education are the preferred methods of compliance, the Department is authorized by the various laws to take formal enforcement actions to assure compliance with the law.

DEP officials stated that immediately rushing to issue an order to the well operator may cause the operator to become uncooperative and hinder the necessary collaboration DEP requires to conduct a thorough investigation. Further, DEP noted that if the complainant and the operator are resolving the matter between themselves (e.g., a settlement agreement), then there may be little DEP can do because the complainant may not want DEP's further involvement. To this point, DEP noted

[16] Chapter 78 of the *Pennsylvania Code* (Code), 25 Pa. Code Chapter 78, which was promulgated prior to the enactment of Act 13, provides DEP additional authority in cases which involve stray gas. Specifically, Section 78.89 of the Code, 25 Pa. Code § 78.89, requires an operator to conduct an investigation and to take action to identify, mitigate, and resolve the stray gas problem. The operator must report its findings to DEP "for approval within 30 days of the close of the incident, or in a timeframe otherwise approved by the Department." *See* 25 Pa. Code § 78.89(h).

it has no enforcement authority over a settlement agreement between an operator and a complainant.

While a "cooperative" approach may bring about instances of operator compliance, such collaboration raises concerns that DEP chooses to play the role of a mediator instead of a regulator.[17] In essence, there is then an appearance that DEP is seeking complainant satisfaction at the expense of issuing orders to operators as required by the Act. While obtaining compliance may include mediation, it should not be the substitute for enforcement actions required by law.

DEP's collaborative approach toward water supply investigations is contrary to the demands sought by the citizenry, who want strong environmental enforcement over shale gas development—and in particular—cases involving impacts to water supplies.

We disagree with DEP's approach. The Act clearly states that DEP "shall issue orders." The Pennsylvania courts[18] have long held that "shall" is a presumptively mandatory requirement—meaning that DEP is required to take that action when the requirements of the Act have been met. Accordingly, under the Act, we contend that if DEP determines that a water supply has been adversely impacted, then it <u>must</u> automatically issue an order requiring the operator to take action to fix the problem—even if the operator has already done so voluntarily.

When DEP does not take consistent and timely enforcement action, it conveys a message to operators, whether real or not, that operators can "make a deal" to comply with the Act, thus circumvent a DEP enforcement action on their record as a Pennsylvania operator. We believe that this lack of enforcement action is not consistent with the legislative intent of Act 13 and does little to promote the transparency and accountability Pennsylvania citizens desire over shale gas development impacts.

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[17] Under the Act, 58 Pa.C.S. § 3251(a), "conferences" may occur between involved parties and the department. Conferences are to be used to "discuss and attempt to resolve by mutual agreement a matter arising under this chapter." The scheduling of conferences; however, "shall have no effect on the department's authority to issue orders to compel compliance with this chapter."

[18] In *Oberneder v. Link Computer Corp*., 548 Pa. 201, 205, 696 A.2d 148, 150 (1997), our Supreme Court stated: "By definition, the word 'shall' is mandatory. Accordingly, there is no room to overlook the statute's plain language to reach a different result."

We found an example in our complaint investigation file reviews where DEP seemed to be conciliatory toward an operator instead of taking the forceful attitude expected of an environmental regulator. The following June 2010 e-mail from a DEP inspector to an operator regarding the inspector's conclusions demonstrates our concerns:

> It is my interpretation that the water quality has changed slightly. The only parameter outside of safe water drinking standards is TDS, however, the key word in our regulations is impacted. My opinion is that I feel that the well has been impacted by operations on the [xxxx] pad. Even though the changes are slight, it is my job to ensure public safety and health, and I always err on the side of caution. That is why I am asking you to consider treatment for this system. A simple charcoal filter should take care of the TDS and lower all other parameters. Also if installation would be a time issue, a water buffalo would be nice for the interim. If you feel that I have not made a fair assessment and you want to challenge my decision we can discuss this on the 29th. I attached the copy of my results to this email.[19]

The operator's response was merely a simple acknowledgement that he received the results and that the operator would forward the information to his environmental consultant and get back to the inspector next week. We could find no other documentation in the file that showed that an order was ever issued to this operator regarding this positive determination.[20]

This e-mail evidences an overly lax position by DEP with respect to restoring a water supply in this case. We can find no reason for DEP to suggest to an operator to "consider

[19] We omitted the operator's name and well pad location. "TDS" refers to total dissolved solids, a parameter that is used in evaluating whether a water supply has been impacted by drilling activity. Also, a "water buffalo" refers to a temporary potable water supply, which is connected to a home plumbing system, usually at the operator's expense.

[20] We did find that the operator was ultimately fined through a consent assessment and civil penalty (CACP), but that document did not address specific impacts to the homeowners' water wells. Further, the CACP was not finalized until nearly three years after the initial complaint. We could not obtain any further evidence regarding this matter.

treatment" and if installation would be a time issue "a water buffalo would be nice."

Not only does this approach lead to inconsistent enforcement—or no regulatory enforcement at all—it also impacts citizens' quality of life as they are forced to wait for DEP to take the very action that the law requires of DEP.

The Department of the Auditor General's position is that based on the plain language of the Act (and the related legislative journals) whenever DEP has determined that a water supply has been adversely impacted by oil and gas activity, DEP must issue an administrative order against the responsible party and then ensure that the water supply is restored/replaced.

RECOMMENDATIONS

1. DEP must comply with the Act by routinely and consistently issuing orders to operators whenever DEP determines that water supplies have been adversely impacted by oil and gas activities to assure restoration or replacement of water supplies.

2. DEP should amend its internal policy, *Enforcement Actions by DEP's Oil and Gas Management Program*, so that the policy clearly indicates that orders must be issued whenever DEP makes a "positive determination" under Section 3218 of the Act.

Department of the Auditor General's Evaluation of DEP's Response

DEP disagreed with the finding and disagreed with Recommendations One and Two. DEP's response to the report appears in full beginning on page 118.

We stand by our finding and recommendation that DEP must consistently issue orders and we disagree with DEP's stated response on several points.

First, we disagree with DEP that there is "no legal basis" for our conclusion that DEP is required to issue an order whenever it has determined that a water supply is adversely impacted by unconventional gas well activities. Quite to the contrary, we

believe that pursuant to long standing case law and the plain meaning of Section 3218(b), which was also in the prior Oil and Gas Act, we have a reasonable and supportable basis for our conclusion that DEP is mandatorily required to issue an order as long as one of the enumerated conditions[21] in the provision have been met.

Although we acknowledge that DEP, as an administrative agency, has discretion in interpreting statutes it is charged with enforcing[22], we believe that the General Assembly's intent in crafting this provision was to restrict DEP's discretionary judgment on whether to issue an order after investigation if one of the enumerated conditions have been met. In addition, because Act 13 (which is a continuation of the former Oil and Gas Act) contains both the word "shall" and the word "may," we believe that the General Assembly intended "shall" and "may" to have separate meanings and not to be interchangeable and that the plain meaning of the words must prevail.[23]

Second, we refute DEP's claim that "the law only requires that DEP issue an order when an operator responsible for adversely impacting a water supply refuses to restore or replace the water supply." Again, based on the plain meaning of Section 3218(b) of Act 13, DEP is required to issue an order whenever it finds after investigation that one of the enumerated conditions in the provision have been met.

DEP believes that an order is needed only when an operator delays or refuses to restore the water supply, but by what measure is a delay reasonable or unreasonable? To the complainant with an adversely impacted water supply, there should be no delays. If DEP *did* issue orders routinely and consistently, then clear indicators of what was to happen, by whom, and when, would be evident. We are hard pressed to believe that DEP wishes to stand on its assertion that just

[21] These conditions include that DEP is required to issue an order whenever it finds after a investigation that the pollution or diminution was caused by (1) drilling, (2) alteration, or (3) operation activities or (4) if it presumes the well operator is responsible for pollution under subsection (c) (relating to "rebuttable" presumptions). 58 Pa.C.S. § 3218(b).

[22] *See Bethenergy Mines Inc. v. Com., Dept. of Environmental Protection*, 676 A.2d 711, 715 (Pa. Cmwlth. 1996), Reargument Denied: "When reviewing agency interpretations of statutes they are charged to enforce, our Supreme Court…has adopted a 'strong deference' standard for reviewing agency interpretations of statutes they are charged to enforce."

[23] In *Obernedar v. Link Computer Corp*., 548 Pa. 201, 205, 696 A.2d 148, 150 (1997) our Supreme Court stated: "By definition, the word 'shall' is mandatory. Accordingly, there is no room to overlook the statute's plain language to reach a different result."

because an operator is being a "good neighbor" that DEP is absolved from taking measured and consistent enforcement actions to ensure delays do not occur in the first place.

Third, in the preamble of Act 13, the General Assembly stated that it had the intention of protecting the environment and its natural resources, which includes the commonwealth's water supplies and environmental rights as secured by the Constitution of Pennsylvania. This language in the preamble, as well as certain provisions of the Statutory Construction Act[24] help to support our more restrictive interpretation of Section 3218(b) and our conclusion that DEP must issue orders when adverse water supply determinations have been made rather than working "cooperatively with operators to secure voluntary compliance." Simply put, the issuance of an order does not preclude the cooperation or compliance by operators.

In addition, based on the legislative journal entries for Act 13, it is clear that members of both parties of the General Assembly were most concerned about DEP being a strong regulator to protect Pennsylvania's drinking water. In fact, although subsection (a) and (b) of Section 3218 of Act 13 were in the prior Oil and Gas Act,[25] the General Assembly amended subsection (a) to provide for the following, in part:

> [t]he department shall ensure that the quality of a restored or replaced water supply meets the standards established under the act of May 1, 1984 (P.L. 206, No. 43), known as the Pennsylvania Safe Drinking Water Act, or is comparable to the quality of the water supply before it was affected by the operator if that water supply exceeded those standards. [26]

Our conclusions are also supported by good governance and the need for accountability and transparency over shale gas development. Such qualities are best measured through the

[24] Under subsections (a) and (b) of Section 1921 (relating to **Legislative intent c**ontrols) of the Statutory Construction Act, 1 Pa.C.S. § 1921(a) and (b), provide as follows: "(a) The object of all interpretation and construction of statutes is to ascertain and effectuate the **intention** of the General Assembly. Every statute shall be construed, if possible, to give effect to all its provisions. (b) When the words of a statute are clear and free from all ambiguity, the letter of it is not to be disregarded under the pretext of pursuing its spirit."
[25] 58 P.S. § 601.208(a) and (b).
[26] 58 Pa.C.S. § 3218(a).

proactive and consistent enforcement of environmental laws and regulations. When DEP fails to automatically issue orders, the potential exists that such violations can be dealt with "off the books" and away from the public's scrutiny.

Fourth, DEP indicates in its response that its method of voluntary compliance is more effective and expeditious than issuing orders; however, it must be noted that there is no readily available evidence to measure this conclusion other than DEP's anecdotal responses. While DEP claims that many operators resolve water complaints *before* DEP completes its investigation, this assertion does not paint a full picture of the issues at hand. In other words, just because a water supply issue has been resolved between an operator and a complainant, does not mean that the environmental impact has been resolved.

Fifth, while our report indicated that only one complaint resulted in an order, DEP stated that orders were issued to operators in three of the fifteen complaints mentioned in our finding. We stand by our statements in the report. Based on the documents we reviewed, there was only one order that included a requirement for the operator to restore or replace the affected water supply. The other two orders that DEP referenced did not contain a requirement to restore or replace the water supply. As we stated in our finding, DEP is not consistently issuing orders as required by statute when it finds that an operator is responsible for adversely impacting a water supply.

Finally, with regard to the email exchange we highlighted in the report, we did state that a civil penalty was assessed. DEP claims that its approach to resolve the complaint was successful. However, it should be noted that this penalty took more than three years to reach and did not address the specifics of impacts to the complainants' water wells. Consequently, we disagree with DEP that its approach could be deemed "successful" in this case. As evidenced by the email exchange, DEP had the necessary proof to conclude that the water had been impacted; therefore, a more effective approach would have been for DEP to immediately issue an administrative order to the operator, instead of "showing its hand" to the operator as a means of bringing about action and then taking three years to issue a civil penalty.

Finding Two → DEP's communications to complainants regarding potential adverse impacts to their water supplies were neither clear nor timely.

Key points:

- DEP did not consistently and effectively provide complainants with clear written investigation results.
- DEP could not verify its own compliance with statutorily required timeframes.
- DEP did not always resolve complaints timely.

In Finding One, we discussed the issue of DEP not consistently issuing administrative orders in cases where operators adversely impacted water supplies. Related to this issue, is how DEP communicates its investigation results (positive or negative) to the complainants.

DEP does not clearly communicate its investigation results to complainants. As a result, complainants can be left with confusing and complicated information about their water quality.

We reviewed DEP's complaint data to identify those complaints where DEP made a "determination" regarding a complainant's allegation of a water supply impact. Through this review, we selected a test group of 86 complaints (42 complaints from the Pittsburgh district and 44 complaints from the Williamsport district). We then reviewed DEP's CTS records and, where necessary, supporting documentation located in its oil and gas district offices.[27] Our file review sought to locate instances where DEP had sent a determination letter to a complainant(s).[28] We also sought to locate supporting lab results and other documentation related to the complaint.

[27] Although we initially focused on all three oil and gas district offices (Meadville, Williamsport, and Pittsburgh), we subsequently narrowed our file reviews to the Williamsport and Pittsburgh district offices because those offices had more shale gas-related complaints.

[28] These letters are sent to complainants under Section 3218(b) of the 2012 Oil and Gas Act, 58 Pa.C.S. § 3218(b), which requires DEP to "make a determination" about claims of water pollution or diminution. As discussed in Finding One, DEP has a statutory mandate to investigate these claims within 10 days and make its determination within 45 days. Where DEP finds that a water supply has been adversely impacted, DEP must issues orders to the well operator to restore or replace the affected water supply.

As discussed in the sections that follow, DEP should improve how it communicates with complainants. Of the 86 cases we reviewed, and after we specified to DEP that we wanted to see determination letters, only 28 determination letters were located. Where a letter was sent to the complainant, we found the letters left complainants wondering, "What happens next?"

We found nine cases where DEP provided the complainant with investigation results over the phone, and in 23 other cases we could not locate any evidence in the file indicating if or how the results were communicated to the complainant (i.e., by phone or written). In the remaining 26 cases, either the investigation was ongoing, or the complaint had been resolved through some other means that negated DEP's involvement (e.g., complainant declined DEP's involvement, issue resolved itself, etc.), and therefore a determination letter was not necessary.

In a separate test, we attempted to evaluate DEP's compliance with the statutory mandate that requires DEP to make a determination within 45 days of receiving a complaint that alleged an adverse impact to a water supply. We found that DEP was not always timely in completing its investigations.

DEP's conclusions about potential water quality impacts are not clearly communicated to the complainant.

Because DEP has a statutory mandate to make a determination on whether water quality has been impacted, we looked for a "determination letter" in each of the 86 complaint files we reviewed at the district offices. We used the official determination letter to evaluate the timeliness of DEP's complaint investigation and the effectiveness of DEP's communication back to the complainant.

In these determination letters, DEP typically states to the complainant that DEP received the complaint and, on a certain date(s) DEP collected water samples and found tested parameters of x, y, or z. DEP then concludes the letter with a statement that the water supply was (or was not) adversely impacted. DEP attaches the DEP lab results to the letter, along

with a photocopied pamphlet from the Pennsylvania State University titled "How to Interpret a Water Analysis Report."

We identified two problems when searching for the official determination letters. First, when we reviewed the Pittsburgh district files, we were informed that inspectors did not consistently prepare determination letters at the conclusion of the investigation because inspectors sometimes communicated those results via telephone. As a result, no determination letter ever existed in those cases. This practice was especially prevalent in the early years of our audit period (January 1, 2009, through December 31, 2012).

Second, in one case we reviewed in Pittsburgh, we found the determination letter had not been signed and was not on DEP letterhead, giving the appearance that the letter was just a draft. In two other cases while the letter was signed, the letter was not on DEP letterhead. Consequently, we are unsure if actual determination letters were ever sent to the complainants since we could not locate an official copy.

In those cases where we could find determination letters, we reviewed those letters and found the following inadequacies:

1. The letter did not document what the next steps will be for the complainant after DEP made its conclusion. Similarly, the letter did not indicate other options available to the complainant. Consistent with the preamble of Act 13's Chapter on "Oil and Gas" to protect among others, "environmental rights and values secured by the Constitution of Pennsylvania,"[29] it is our position that whenever DEP issues a determination letter DEP as a good government practice should educate the complainant about his/her next steps and other options. One example of an option is provided under Section 3251(a) of the Act, which states that "conferences" may occur between involved parties and the department.[30] Conferences are to be used to "discuss and attempt to resolve by mutual agreement a matter arising under this chapter." DEP should communicate this information to the complainant in

[29] 58 Pa.C.S. § 3202(4).
[30] 58 Pa.C.S. § 3251(a).

writing, and DEP should provide forms and have procedures in place so that the complainant can schedule such a conference.

2. DEP's attachment of a photocopied pamphlet to its test results can lead to confusion for the complainant because the pamphlet is not specific to oil and gas impacts. While DEP is trying to be helpful by providing additional, third-party information, DEP has the necessary and qualified staff to develop its own custom-tailored explanatory materials.

The actual lab results are also extremely difficult to read and do not clearly indicate good or bad ranges for the tested parameters.[31] While it is logical to present test results scientifically, those results should be explained in layman's terms that would include color-coded ranges and show exactly where the tested parameters fell within those ranges.

For complainants who are not familiar with scientific terms and legislative references, the determination letters can be very confusing. The following example illustrates the frustration and confusion that complainants can experience.

DEP investigated an alleged water supply impact complaint and sent a letter to the complainant using the following reference line in the letter: "Act 223 Section 208 Determination." The letter began with the following introduction:

> *Our investigation of your area conducted on [date] indicates there is natural gas in your water supply. The analyses and other related information are enclosed for your records.*

[31] Note: DEP tests for contamination from drilling activities using predefined laboratory "suite codes." In layman terms, these codes are used to group certain tests together. There are many suite codes and tests available to DEP, and DEP's use of suite codes is ongoing. When DEP conducts a water supply investigation, it tests for certain parameters, which are key indicators of contamination from drilling activity. Laboratory results that DEP reports or uses in an investigation must be quality controlled to ensure the results are valid and reliable. We did not audit DEP's laboratory; however, we note that DEP's laboratory is fully accredited and must follow certain testing and reporting standards to maintain that accreditation. The issue of suite codes and DEP's reporting of test results that are not quality controlled has been scrutinized in the media. We did not audit the science behind DEP's use of suite codes.

After a discussion of the dangers of methane in a water supply, the letter then went on to conclude that:

> *It has been determined that your water supply has been impacted by natural gas contamination. The cause is currently unknown.*

This letter documents that DEP conducted an investigation and "determined" that the water supply had been adversely impacted. Coming to this conclusion would be logical—after all, the letter was written under the reference line of "Act 223 Section 208 Determination"—and apparently this conclusion is what the complainant believed too.

Several months passed without any further communication from DEP so the complainant contacted his legislator and began inquiring about what he should do about his water supply that DEP said was impacted.

After the legislator contacted DEP, DEP went back through its records and found that while the well was contaminated with methane gas, the contamination was <u>not</u> from drilling activity, since the nearest well was 8,000 feet away. This information was never communicated to the complainant in the determination letter.

To be clear, in the above example, DEP met its statutory requirement to respond to the complaint and to make its "determination." Our concern pertains to how DEP communicated its results to the complainant—and in this respect—DEP failed to meet what a "reasonable person" expects of a regulatory agency.

At a minimum, DEP should have been clear that the contamination could not be tied to oil and gas activity and, therefore, DEP could not hold an operator responsible for correcting issues with the complainant's water supply. Instead, the determination letter, like so many other aspects of DEP's complaint management procedures, was not adequate.

DEP failed to complete complaint investigations timely.

We attempted to evaluate DEP's compliance with the statutory requirement to respond to water supply complaints within 10 days and make a determination within 45 days following notification.[32] We reviewed the complaint data and found that, during the audit period, DEP received over 3,400 complaints that were assigned to the oil and gas program for investigation.[33] However, we quickly determined that we could not definitively conclude on DEP's compliance with the statutory requirement for the following reasons:

1) DEP did not clearly designate which complaints alleged a water supply impact and, thus, were subject to this provision of the Act.

2) DEP did not document a "determination" date in the database, and the complaint investigation notes did not always indicate if and when a determination was made.

Even though we could not conclude on DEP's compliance with the "response" and "determination" provision of the Act, we could evaluate the timeliness of DEP's responses and resolutions of a select group of complaints by reviewing the complaint received date, DEP's response date, and the resolved date.

Therefore, for the 86 complaints we reviewed, we calculated the number of days it took DEP to respond to the complaint, as well as the number of days it took DEP to resolve the complaint. The results of our analysis are presented in the following table.

[32] 58 Pa.C.S. § 3218(b).
[33] Not all of these complaints pertained to water quality issues.

Water-related complaints selected for review	Williamsport 44		Pittsburgh 42	
How timely was DEP in "responding" to the complaints?	No.	%	No.	%
0 to 10 days	44	100%	27	64%
More than 10 days	0	n/a	15	36%
How timely was DEP in "resolving" the complaints?	No.	%	No.	%
1 to 45 days	15	34%	32	76%
46 to 90 days	10	23%	4	10%
90+ days [b/]	17	39%	6	14%
Ongoing	2	4%	0	n/a

Source: Developed by Department of the Auditor General staff from review of DEP CTS data and from on-site file reviews. We cannot ascertain the completeness or accuracy of DEP's data. See Appendix A for more information.

Response Timeliness.

A "response" means that DEP either called or visited the complainant to discuss the issues the complainant was experiencing. As the table indicates, we found that in the Williamsport district, all 44 (100%) of the complaints that we selected had received a response from DEP within 10 days.

However, in the Pittsburgh district, only 64 percent (27/42) of the selected complaints received a response within 10 days. Of those remaining 15 complaints that were not responded to within 10 days, we determined that 13 were responded to within 30 days, and the remaining 2 complaints had response times of 69 and 159 days. After reviewing the documentation in the files, it appeared that these two complaints had probably been responded to sooner, but the dates recorded in CTS were incorrect. This point underscores a consistent problem we have in analyzing DEP's data—the data fields that could be used to answer relatively simple questions cannot be used with any degree of certainty. More details of the problems with DEP's complaint tracking system can be found in Finding Three.

While it appears that in the Williamsport district DEP complied with the 10 days timeframe to respond to complaints, DEP should determine why the Pittsburgh district did not show similar results. DEP should then implement procedures to ensure that all complaints alleging water supply impacts

receive some sort of response from DEP within the statutorily required timeframe of 10 days. Waiting up to 30 days to respond to a complaint alleging a potential water supply impact is unacceptable because it places an unnecessary burden on the complainant.

Resolution Timeliness.

With regard to how quickly DEP resolved the complaints, we found that the Williamsport district resolved complaints within 45 days only 34 percent of the time, while the Pittsburgh district resolved 76 percent of its complaints within 45 days.

We asked DEP officials about this regional difference, and they explained that the Williamsport district has a greater occurrence of "stray gas migration" cases, which are complex and require multiple rounds of highly-specialized (and timely) "isotopic" gas testing to identify the responsible party. Therefore, the investigation can take several months before DEP has compiled sufficient evidence to make a determination that shale gas activities adversely impacted a water supply.

While we agree with DEP that stray gas migration cases can be lengthy and complex, DEP should improve its performance in documenting the status of its investigations and in keeping complainants informed about the complexity of these cases, as well as the expected completion date.

DEP also cited other possible factors for not resolving complaints within 45 days, such as delays in getting water test results back from its lab, and comparing those results to pre-drill test samples that the operator may have in its possession. While reasons for delays in individual cases are varied and could be valid; overall, DEP should ensure that it acts as quickly as possible to resolve all complaints that it receives and then effectively communicate the results of those investigations back to the complainants.

RECOMMENDATIONS

3. DEP should ensure that it clearly identifies and addresses all complaints that fall under the provision of the 2012 Oil

and Gas Act requiring a water supply complaint response and a determination within the mandated timeframes. Further, DEP should document the dates accurately for response and determination to support compliance with the Act.

4. When DEP is unable to comply with statutory deadlines for response and determination, DEP should ensure that the reasons for noncompliance are adequately documented in the pertinent complaint file.

5. DEP should ensure that determination letters are prepared and sent to the complainants for all complaints alleging a water supply impact. The letter should clearly explain the results of the investigation in understandable terminology.

6. DEP should develop a water sample test report that is easier to read, as well as its own publications that are specific to shale gas development, to serve as guidance in instructing the complainant on how to read lab results.

7. The General Assembly should evaluate whether the 45-day resolution mandate is realistic for cases involving stray gas migration. If the General Assembly concludes the timeframe is unrealistic, the law should be amended to allow for more time to complete a thorough investigation.

Department of the Auditor General's Evaluation of DEP's Response

DEP disagreed with the finding, but agreed with Recommendations Three through Six and offered no position on Recommendation Seven, which was directed to the General Assembly. DEP's response to the report appears in full beginning on page 118.

Our recommendations addressed weaknesses we noted in DEP's operations, specifically in relation to how DEP communicated with complainants and the timeliness of DEP's investigations into water supply impacts. Consequently, we are perplexed that DEP disagreed with the finding itself, yet agreed with all of our recommendations that were directed to the agency to help correct the deficiencies we identified.

DEP noted in its response that our review of water supply complaints was based on isolated examples and was not representative of DEP's overall performance. As we noted in

the report, our review of water supply complaints involved a selection from all water supply complaints which were recorded in CTS. As highlighted throughout the report, isolating these complaints was exceedingly difficult because of DEP's ineffective system as well as its inconsistent use of CTS. As also evidenced in this finding, DEP's supporting hard-copy documentation was equally poor and, in some cases, non-existent. We stand by our testing methodology and the resulting conclusion—DEP needs to improve its communications with complainants and shorten the length of time it takes to conduct its investigations into water supply complaints.

In its response, DEP also noted the following:

> Prior to the commencement of the Auditor General's special performance audit, DEP recognized the need to address all water supply complaints in a consistent manner throughout the Commonwealth. DEP also realized that water supply determination letters should be simplified for complainants' ease of understanding. Accordingly, DEP is currently drafting standardized determination letters that will clearly explain the results of a water supply investigation in understandable terminology, provide water sample test results in a simplified fashion, and provide useful information to complainants on how to proceed following the conclusion of an investigation.

Given the significance of water supply impacts and the fact that shale gas drilling has been at the forefront of DEP's attention for several years, it is difficult to comprehend why DEP has not been able to move beyond the "drafting" stage of standardizing letters. To be clear, DEP should focus its attention on immediately implementing the use of standardized determination letters.

With regard to the 45-day requirement for DEP to make its determination, we acknowledge that there may be instances where DEP is unable to gather all of the necessary evidence, especially in cases involving stray gas migration. Regardless, the law does not give DEP an option to extend its investigation in those isolated cases. In fact, it is important to note that we

added a recommendation for the General Assembly to consider evaluating and possibly amending the 45-day resolution provision specific to stray gas migration.

Finding Three → DEP utilizes an inefficient and ineffective complaint tracking system that does not provide management with timely and accurate complaint information related to oil and gas activity.

Key points:

- DEP stated that it tracks all complaints it receives about oil and gas activity through its complaint tracking system, yet this system was unable to generate consistent and reliable data on the nature of complaints DEP received.
- DEP's complaint tracking system was not prepared for the influx of complaints DEP received about shale gas; subsequently, several "fixes" have been attempted, but DEP still cannot use its complaint data to reliably answer simple program-related questions.
- Because DEP does not have a reliable means to track complaints, DEP cannot easily identify emerging trends, which may hamper DEP's ability to correct issues through regulatory reform.

Complaint management is a broad term that generally refers to how an agency tracks, investigates, and ultimately resolves complaints. To this end, DEP uses electronic systems and has implemented procedures and policies to aid in its complaint management.

Effective complaint management is important for several reasons. First, DEP needs to be able to assign its already thinly stretched inspection staff in the most resourceful manner possible. Second, DEP needs to be able to ensure that its responses to complaints are consistent and uniform so that the public is assured that DEP will address and resolve its concerns. Last, DEP needs to be able to aggregate information about complaints in a way that furthers the department's mission in regulating oil and gas activity.

DEP's complaint tracking system limitations impacted DEP's ability to effectively manage complaints.

We reviewed DEP's complaint tracking system (CTS) with respect to oil and gas activity, and more specifically, complaints related to water quality. We focused on this system since it is the primary management tool DEP uses for assigning

investigations and other activities related to complaint resolution.

DEP uses CTS to document and track its activities related to environmental complaints.[34] Once a complaint is entered into the CTS database, separate records are created for the associated complaint responses, investigations, and inspections as DEP inspectors resolve the complaint.

However, CTS is not an effective management tool because it was not designed in a manner to enable DEP to answer basic program-related questions, including:

- How many individual complaints did DEP receive and enter into CTS?
- How many complaints were related to shale gas activities?
- How many complaints alleged water supply impacts?

We requested a data extract from CTS of all complaints received during our audit period so that we could answer the above questions. DEP Information Technology (IT) staff took four months—and three attempts—to fully respond to our request.

Over the course of several meetings, DEP IT staff explained the limitations of CTS and how data must be extracted. DEP IT staff provided explanations for the difficulties in extracting the data; however, the CTS data hindered their ability to identify the number of complaints DEP received and entered into CTS.

We also found that, during the majority of our audit period, DEP did not track in CTS whether the complaint was related to shale gas activities. Consequently, there was no way for us to reliably isolate complaints that were solely related to shale gas activity. DEP expanded functionality in CTS in mid-2012 to make a distinction for shale gas-related complaints, but this added functionality occurred late in our audit period, and therefore we could not test its effectiveness.

[34] According to DEP, complaints describe an alleged event, incident, wrongdoing, or concern perceived as a threat to public safety, human health, or the environment, which may be in violation of an environmental law. DEP uses CTS not only for oil and gas complaints, but also for other complaints (e.g., air quality).

Similarly, we attempted to use CTS data to determine how many complaints alleged water supply impacts. However, we learned that this information is also not easily tracked in CTS. In July 2011, DEP added a field to CTS to highlight whether the complainant alleged a water supply impact, but this data field still did not allow us to easily track water supply impacts because the field was used inconsistently by DEP staff.

For example, although a water supply impact could be inferred through reading the text fields of comments entered into CTS, the only way to confirm these free-form text fields was through a manual review. Further, water supply impact was not consistently indicated in the comment fields; therefore, a reader could only infer that a water supply impact may have been possible, but not confirmed.

As a result of these limitations, we found that CTS is not providing DEP management with important information on potential shale gas systemic issues that should be addressed.

In addition to system limitations within CTS, weak controls over the use of CTS impeded DEP's ability to provide effective complaint management.

Moving beyond these system limitations, we identified six areas of concern that highlight DEP's failure to adequately track complaints, which impeded DEP's ability to effectively investigate and resolve the complaints. These issues are discussed in more detail in each of the sections that follow.

1. DEP staff failed to enter complaints into CTS timely.

During our audit period, we found that 1,927 oil and gas-related complaints were entered into the CTS database after the "date received" instead of at the time of complaint intake.[35]

[35] While we use the word "entered," technically, a complaint is not created in CTS until five key fields are entered.

Surprisingly, 169 of those 1,927 complaints were created in CTS 30 or more days after the date received.[36] In fact, in 32 of the 169 complaints, the complaint was not entered into CTS for one to two years **after** the complaint was actually received by DEP. The following table highlights the delays in recording complaints in CTS.

Range of dates between "Creation date" and "date received"	Number of complaints:
30 – 100 days	89
101 – 200 days	31
201 – 300 days	17
301 – 1,025 days	32
Total	169

Source: Developed by Department of the Auditor General staff from CTS data provided by DEP. We cannot ascertain the completeness or accuracy of DEP's data. See Appendix A for more information.

We asked DEP to explain why these 169 complaints were entered into CTS significantly beyond the date received. DEP explained that in the majority of those cases, the complaint was not received directly by a service representative. Instead, the complaint was reported directly to an inspector in the field, who then investigated and resolved the complaint on his/her own outside of CTS. After the complaint was resolved, the inspector then relayed the complaint information to a DEP service representative for entry into CTS.

DEP's explanation is contrary to its own established complaint handling policy, which requires complaints to be entered into CTS upon receipt. DEP's failure to ensure complaints are entered timely highlights an internal control weakness that raises several additional concerns:

- If complaints are investigated and resolved in the field—without first being entered into CTS—how can DEP's management ensure that appropriate response actions were taken and that such actions were both timely and according to DEP procedures?

[36] We conducted this test by comparing the complaint's "date received" field, which reflects the date the complaint was received by DEP, to the "creation date," which is the date that the corresponding record was created in CTS. "Creation date" is a system-generated date, and "date received" is a user-entered date. Therefore, comparing these two dates reflects how timely DEP entered the complaint into CTS. We judgmentally selected 30 days as the benchmark for when a complaint should have been entered into CTS.

- If all complaints are not entered timely, how can supervisors plan and manage inspector workloads?
- If complaints are not entered timely, how can management inquiries on the data be accurate?
- If all complaints are not entered into CTS, how can DEP assure the public that all complaints are investigated? To this point, we do not know if there are other complaints that simply never made it into CTS.

After our audit inquiries, DEP revised its complaint policy in October 2013. This new policy states that "any employee contacted by a complainant alleging violations of any environmental law and/or regulations will ensure that the complainant's information is properly documented and given to a DEP service representative for entry into the complaint tracking system (CTS)." This new policy states that field staff should provide complaint information to service representatives "as soon as possible."

While this change is an important first step toward improving CTS, the results will be effective only if DEP management creates stronger internal controls to ensure that all complaints are entered into CTS, and also entered in a timely manner.

2. DEP staff failed to properly prioritize complaints.

DEP's complaint response policy requires that a priority level be assigned to each complaint when it is received. There are four priority levels: (1) emergency, (2) high, (3) routine, and (4) low. CTS sets a default level of "routine" to each complaint when the complaint is initially entered into the system. The DEP service representatives must change this default setting to properly prioritize each complaint. We found that the Williamsport and Pittsburgh districts did not follow this priority coding system.[37]

According to DEP Williamsport district staff, all complaints that are non-emergency are assigned a "high" priority level. The Pittsburgh district staff takes a different approach and does not change the "routine" priority code on nearly all complaints.

[37] We did not test the procedures used in Meadville district office because the majority of complaints related to shale gas activities are made to the Williamsport and Pittsburgh district offices.

Either approach demonstrates that DEP staff is not using the priority assignments as intended since all complaints are treated equally and not really ranked. As a result, the true high priority complaints may not be given the timely response necessary to ensure the safety of the public and the environment.

3. DEP staff failed to enter complaints into CTS on a one-to-one basis.

DEP stated that it tries to "group" related complaints together. The effect of this grouping, however, is that DEP cannot easily aggregate the total number of complaints it receives. We found numerous complaint records where more than one complainant was associated with a single complaint. DEP explained that the DEP employees entering the complaints can link the same complaint identification number to different complainants. Therefore, one complaint ID can actually be associated with two or more different complaint calls from different people.

By not recording each call as a separate complaint, DEP may be undercounting the number of complaints it receives. Further, because DEP groups complaints together in some cases, yet also separates some complaints in other cases, DEP has no reliable means of actually ensuring that all complaints received an appropriate response from DEP.

4. DEP staff failed to document responses to complaints in CTS.

Every complaint logged into CTS should have a "response," but not every complaint may result in an "investigation." For example, DEP stated that some of the complaints it receives are simply requests for further information from interested citizens. In these cases, DEP "responds" to the complainant, but an inspector does not need to open an investigation.

We reviewed DEP's complaint data and found that there were 76 complaints that did not contain a response explaining how the complaint was addressed. We questioned DEP about these 76 complaints and how it resolved each one. It took DEP more than a month to research and respond to our inquiry, which

highlights the inefficiencies of CTS and DEP's use of the system.

DEP stated that in 33 of the 76 cases there was a "clerical error" in not recording the response and/or investigation information in CTS. We disagree with DEP's statement that these were clerical errors. In reality, the "error" was DEP staff's failure to follow the department's policies.

In reviewing DEP's responses to these 76 complaints, we found disconcerting explanations. For example:

- DEP responded that seven of these complaints were "never assigned to a program or inspector for response – could be a duplicate record that needed to be deleted." DEP could not provide us with assurance that the complaint was actually responded to and did not "fall through the cracks." This duplicate record issue could have potentially been caused by DEP's inconsistent approach in "grouping" complaints.

- For eight other complaints, DEP stated that "an investigation is ongoing." Three of the cases date back to 2010 yet no response and investigation dates were recorded in CTS as of the time of our review. Based on this response, we are left to question why the investigation information was not recorded in CTS more timely.

- In seven cases, DEP stated that "a separate agreement had been reached between the complainant and the operator." None of that information had been recorded in CTS.

Finally, with regard to this group of 76 complaints, DEP's statements about one case brings to light larger issues as to how DEP responds to complaints.

Issue Summary. A complainant called DEP alleging that gas drilling is the reason they are unable to drink their water and believed their animals were sick from the water. DEP, in its response to our inquiries, stated that "Additional records could not be found and inspector has since left agency. A review of the file in August closed the case because no additional claims had been made by complainant." The allegation appears to be

very serious, and the fact that DEP cannot find any records related to this complaint is troubling. The lack of information raises the following questions:

- Was this complaint ever addressed?
- Was the complainant's water issue resolved?
- Did nearby gas drilling adversely impact this water supply, for which DEP should have issued a notice of violation and/or an administrative order?

Moving beyond the lack of documentation in this case, we found DEP's statements related to how the complaint was resolved even more troubling.

- DEP closed the complaint simply because no other claims were filed by this complainant, even though DEP had no record of how the complaint was resolved.

- DEP strongly asserted to us that based on the complaint description that the information was related to a bacterial problem and the common occurrence of high iron and magnesium related to poor well and sewage construction in the complainant's geographic area. DEP further asserted that this complaint only highlights a deficiency of data management and is not an example of shale drilling impact on water quality. In our opinion, DEP misses our point: DEP's lack of documentation is as much a problem as DEP's failure to respond to the complainant. The simple fact remains that no evidence exists as to whether this complaint was a bacterial issue or an adverse impact from shale drilling.

5. DEP staff failed to ensure reliable, accurate, and complete investigation information was documented in CTS.

According to DEP's policy for complaint response management, effective April 7, 2011, "program staff who investigate a complaint (or other designated staff) will document the results of the investigation in eFACTS or CTS, and prepare reports/correspondence within established timeframes."

Since DEP required inspectors to document their investigations in CTS, we expected to see CTS investigation notes that thoroughly described how DEP responded to citizen complaints and the precise procedures taken to resolve the complaint. Instead, we found that DEP inspectors recorded only sparse information in CTS.

For example, one CTS record we reviewed simply contained an investigation note that stated "… a positive impact letter was sent to the complainant." When we asked to review the hard copy file for this complaint, we found it actually contained hundreds of pages of notes, pictures, lab results, and other documents.

Without having all relevant information documented in CTS, and given the relatively high turnover DEP has experienced with inspectors, there is an increased risk that information will be lost or misplaced.

We also found examples where key data fields, such as "date resolved" were blank because DEP staff failed to record in CTS that the complaint had been resolved. We even found instances where the resolved date appeared to be incorrect based on later dates mentioned in the investigation notes or on lab sample results.

In other cases we reviewed, we found significant investigation conclusion errors. For example, we reviewed a selection of eight complaints in CTS which indicated a positive determination letter had been sent to the complainant confirming that a water supply had been impacted by oil and gas activity.[38] However, when we asked to see the actual determination letters in DEP's files, DEP informed us that for two of the eight cases, or 25 percent, the inspector made an error in his CTS data entry. Upon further review, DEP stated a *negative* determination letter had been sent to the complainant, consequently, the investigation conclusion was captured in CTS incorrectly.

These errors and omissions raise serious concerns because without an ability to accurately capture complaint information,

[38] Determination letters are issued after DEP conducts an investigation to determine whether a water supply has been impacted by oil and gas activity.

DEP cannot use CTS as an effective tool for ensuring that all complaints are addressed and appropriately resolved.

As previously mentioned, DEP issued a revised complaint response management policy, effective October 11, 2013. The new policy states the following:

> **Documenting Complaints**: Inspection findings, complaint and witness statements, pictures, and sample results must be documented and electronic copies of all attached to the appropriate complaint record in CTS.

The revised policy also provides extensive guidelines on how to document results of complaint investigations while protecting the confidentiality of complainant information.

While the revised policy is a step in the right direction, DEP should go one step further and ensure that all staff receives adequate training regarding the new procedures. Finally, DEP should implement procedures to ensure compliance with the policy.

6. DEP failed to ensure that all complaints were recorded in CTS.

During the course of our audit, we were contacted by a complainant who had concerns about how DEP responded to his complaint. When we attempted to find this complaint in the CTS data files that DEP provided to us, we were unable to locate the record.[39]

We knew that this individual's complaint had been addressed to DEP's secretary, so we asked DEP to provide copies of all letters and e-mails which were tracked outside of CTS by central office personnel. DEP again replied that all complaints are entered into CTS at the regional level and that "DEP does not have any correspondence that would fit the criteria of the request."

[39] This individual's concerns pertained to a conventional well site that was not drilled and the complainant's belief that the site was not properly restored by the operator. DEP's oil and gas program is responsible for monitoring both conventional and unconventional well sites. Our audit focus was primarily on unconventional well sites, but the applicability of this complaint to our audit was significant as it validated whether all complaints were contained within CTS. DEP did not distinguish between conventional and unconventional complaints in CTS for most of our audit period.

We then presented these contradictions to DEP. DEP explained that in this particular case the complaint was "routed through the log letter process because the concerns were a matter of adhering to Department policies as well as addressing [the] complaint." DEP explained it had a separate system for tracking log letters "and usually no duplicate entry is made into CTS." Because of these ambiguities in definitions and in procedures, we are uncertain what DEP truly considers to be a "complaint" versus what it considers to be a "concern" or even an "issue."

While this case is just one example that was brought to our attention, we cannot determine how many other "concerns" were actually complaints that DEP never logged into CTS.

Further, and more troubling, is the fact that because DEP has very loose controls over CTS and its use of the system, the potential exists for DEP to handle complaints essentially "off the books," which would be contrary to DEP's efforts to ensure transparency and accountability. DEP's inability to track all complaints uniformly and show accountability could significantly erode the public's confidence in whether DEP is addressing all complaints and taking all necessary actions to ensure water quality impacts are addressed and corrected.

RECOMMENDATIONS

8. DEP should develop a viable plan for complaint tracking and response and study its statutory mandates to determine the following:

    - what information must be captured to ensure all complaints are entered and created in the database in a timely manner;
    - what information is needed to facilitate effective responses to complaints and then track those complaints through ultimate resolution;
    - what information must be captured to answer key questions about complaints, responses, and important trends;
    - what information must be captured to ensure all current complaint information is available to inspectors when performing their duties; and

- what data is missing from, or external to, the current CTS.

9. DEP should determine the best information technology platform to capture the information needed by DEP to track complaints and facilitate timely responses. The system should enable DEP to eliminate separate side systems and manual documentation to track activities. The system should be a user-friendly, structured relational database that provides DEP the tool to effectively collect necessary information for monitoring complaints. The goal would be to allow data on shale gas development complaints to be easily aggregated and summarized.

10. DEP should ensure that field staff comply with its newly revised policy on complaint handling procedures, including thorough and complete investigation notes, priority coding, and assignment of complaint identification numbers. DEP should develop procedures to implement the new policy and provide training to ensure that all pertinent information about complaints and complaint resolution activities is captured in the CTS database in a timely manner.

11. DEP should consistently track complaints on a one-to-one basis, meaning one complaint per phone call, e-mail or letter, and DEP should track all complaints in CTS. Further, each complainant should receive the CTS complaint identification number assigned by CTS when the complaint is entered into the database. All future correspondence about the complaint should include the CTS complaint identification number to allow complainants to track the resolution of their specific concerns.

Department of the Auditor General's Evaluation of DEP's Response

DEP disagreed with the finding, but agreed with Recommendations Eight through Ten. DEP disagreed with Recommendation Eleven. DEP's response to the report appears in full beginning on page 118.

We stand by our conclusion that DEP's complaint tracking system is inefficient and ineffective. However, in its response, DEP argues that its complaint tracking system (CTS) is

essentially the best it can do and that DEP has made certain changes to improve CTS functionality.
We acknowledge that these changes may improve DEP's use of CTS in the future; however, these actions are "too little too late." For more than five years DEP has used the system inefficiently, ineffectively, and subsequently has been left with unreliable and incomplete data to use in making future regulatory improvements. As we noted throughout this finding, it was exceedingly difficult to use this data in any aggregated manner, which is essential in guiding the oil and gas program. DEP should do better with this going forward.

In its response, DEP indicated that in October 2013, it implemented a new complaint handling policy, which for the first time provided DEP employees with clear direction on the proper handling of complaints. It should be noted, however, it was only after we asked numerous questions about the complaint tracking system and the accompanying policy that DEP advised us that it was developing a revised complaint handling policy. That revised policy was not implemented until nine months after the audit began. Further, as documented by the failings we saw with how DEP tracked complaints under its previous complaint handling policy, DEP should be more proactive in ensuring compliance with this new policy.

DEP's response was also critical of our reporting of a water supply contamination complaint that lacked sufficient documentation in CTS. DEP alleges that we chose not to review certain documentation that it possessed. To be clear, when we first asked for information about this complaint, DEP told us on November 20, 2013, that "***additional records could not be found and the inspector has since left the agency.***" We included this complaint in the report as an example of DEP's failure to track complaints. After the audit exit conference, DEP said it would research this complaint further. On May 8, 2014, we were informed via email of the following (emphasis added):

> In relation to case 1, **we have not been able to locate additional records related to this complaint**. The CTS long description related to this complaint reflects that it is a bacterial problem and the common occurrence of high iron and magnesium related to poor well and sewage

> construction in this geographic area. While this is an example of deficiencies in data management, it is not an example of shale drilling impact on water quality.

We received no other information from DEP regarding the referenced complaint. Surprisingly, in its response, DEP now asserts that, "information is readily available in the hard-copy file located in the DEP's regional office; however, the auditors chose not to review the file." Since DEP told us on two separate occasions that it could not find additional records related to this complaint, we were left with no other conclusion than DEP "had no additional records." We remain puzzled by DEP's contradictory statements.

Similarly, DEP took exception with our reporting of a complaint that was not tracked in CTS. According to DEP's policy, and our specific inquiries, this complaint should have been recorded in CTS. In its response, DEP stated that the complaint was not related to a water supply impact nor was it related to unconventional gas well activities; therefore, there was no basis to support our criticism of how DEP tracks water supply complaints. DEP missed our point on this issue. DEP stated that **all** complaints are recorded in CTS yet we found examples, including this one, where complaints were not recorded in CTS or were not recorded timely. Before we could conduct our analysis to determine how effectively DEP responds to water supply complaints, it was imperative that we had assurance that all complaints were actually contained within CTS. This example is included in the report because it highlighted the discrepancies in DEP's statements to us regarding how it tracks complaints.

DEP also believes its manner of grouping complaints is appropriate. We continue to disagree. Grouping complaints essentially allows DEP to report an overall lower number of complaints because what DEP is really counting are "incidents" and not complaints. If DEP would enter complaints on a one-to-one basis, it would have a better means of ensuring that every complaint, whether related to another complaint or not, receives a response. If DEP chooses to report incidents, then it should also report the number of complaints related to those incidents.

Finally, DEP asserts that the delay in responding to our requests for electronic data resulted primarily from our inability to comprehend DEP's eFACTS and CTS. DEP further claimed that our unfamiliarity with these systems limited our ability to properly formulate requests. This claim is not based upon facts. During this audit, we engaged specialized information technology auditors who possess extensive knowledge and familiarity with commonwealth systems. Without a doubt DEP's systems are complicated; however, the complicated nature of these systems in no way limited our auditors' ability to formulate requests for data.

In fact, it was DEP's failure to provide us with all the information we requested that created delays. For example, in June 2013, we requested CTS complaint data. DEP stated that because of staff shortages it could not fulfill our request until August 2013. When we received the data in August 2013 and our auditors began to test the data, it was apparent that some data was missing. Specifically, the data lacked complainant name and address information. It was not until October 2013, four months after our initial request, that we received all the data we requested. Consequently, for DEP to assert that we did not understand its systems is simply inaccurate. Any lack of understanding of their systems would have inhibited us from making recommendations, yet DEP agreed with the system recommendations we made in our report.

Finding Four → DEP could not provide reliable assurance that *all* active shale gas wells were inspected timely.

Key points:

- DEP lacks clear criteria to measure its performance in inspecting shale gas wells.
- DEP's inspection policy is outdated and ineffective.
- DEP cannot rely on its electronic records to evaluate the frequency and timeliness of its inspections.
- Despite adding several oil and gas inspectors to its staff, DEP did not have sufficient resources to handle the increased demand from the shale gas boom.

Conducting inspections is a fundamental component of DEP's monitoring of shale gas development to ensure water supplies are not adversely impacted by shale gas development activities.

Failure to inspect unconventional wells timely and frequently can have significant and detrimental effects, ultimately leading to potential adverse water impacts. Well site construction errors, problems during the casing and cementing phases of the wells, or any other type of drilling problem may go unnoticed. Any errors in the casing and cementing phase can be especially damaging since those errors can potentially lead to gas migration issues, which can impact not only water supplies, but also residents' health and safety.

Given the significant role inspections can have in properly monitoring shale gas development, we expected to be able to measure DEP's performance in this important program area, but we were stymied by DEP's continued reliance on manual records, as well as the limits of DEP's eFACTS data.

Further, we found that DEP's inspection policy is more than 25 years old and does not specifically address any activity related to unconventional wells. Worse, the policy does not hold DEP to any performance standard in ensuring shale gas wells are inspected timely and frequently.

DEP's inspection policy is outdated and does not provide clear requirements on the timeliness and frequency of inspections.

Oil and gas inspections, including inspections of shale gas wells, are governed by a formal statement of policy in the *Pennsylvania Code*. This policy sets the specific circumstances when an inspection should occur (e.g., siting, drilling, etc.). DEP first established its "Inspection Policy for Oil and Gas Well Activity" in 1987, long before the technological advancements made in unconventional drilling allowed for the development of shale gas in Pennsylvania.

Two years later, in 1989, this inspection policy was formalized as a "statement of policy" in the *Pennsylvania Code*.[40] This statement of policy remains in place today and serves as the starting point for DEP's inspection frequency schedule, even though DEP's inspection responsibilities have increased substantially from shale gas development. The inspection schedule is presented in Appendix E.

We found that the statement of policy has significant limitations. For example, it is difficult to state exactly how many times an oil and gas well should be inspected because the statement of policy does not clearly state that a well should be inspected "X" number of times. Instead, the policy merely states circumstances that warrant an inspection. For instance, the policy states that inspections should occur during each phase of siting, drilling, casing, cementing, completing, altering, or stimulating the well (i.e., fracking).

Further, the statement of policy does not provide a timeframe for when the inspections should be completed once an operator reaches each phase of the process.

When we asked DEP how it ensures compliance with the inspection policy, officials responded that they do not follow the policy requirements, calling the policy "outdated." DEP

[40] *See* 25 Pa. Code § 78.903. The definition of a *statement of policy* is: "A document, except an adjudication or a regulation, promulgated by an agency which sets forth substantive or procedural personal or property rights, privileges, immunities, duties, liabilities or obligations of the public or a part thereof. The term includes a document interpreting or implementing a statute enforced or administered by an agency. The term includes, but is not limited to, guidelines and interpretations."

asserted that while the policy was adopted as a regulation, that policy did not place any specific mandate or requirement upon the department because of the following policy provision:

> The provisions of this statement of policy are subject to the availability of personnel and financial resources. This statement of policy does not create a duty or obligation upon the Department to conduct a minimum or maximum number of inspections per year or during a certain period.[41]

Essentially, this provision creates an exception to policy requirements for when and how frequently inspections are conducted because it allows DEP to conduct inspections only when it has the "personnel and financial resources" to do so.

With increased responsibilities due to the rapid expansion of the shale gas industry, it is difficult to understand why DEP has not developed and implemented a modern policy governing the inspection schedule for active shale gas wells. An updated policy would allow DEP to be proactive, rather than reactive, in assuring citizens that the commonwealth's water supplies are appropriately safeguarded.

In the absence of an updated inspection policy we asked DEP field staff when and how often they conducted inspections of shale gas wells. They provided the following written response:

> Staff attempt to inspect every producing Marcellus well site[42] at least once a year. Every effort is made to inspect active well sites multiple times including, but not limited to, the pre-operational phase (pad construction, erosion and sedimentation controls are put in place, but prior to drilling), during or immediately after spudding[43] the well, all phases of drilling,

[41] 25 Pa. Code § 78.906.
[42] Although DEP stated "Marcellus well site" we have interpreted that statement to mean shale gas wells.
[43] Spudding a well is an industry defined term that means drilling has commenced. Act 13 defines the start of drilling of an unconventional gas well as "spud." *See* Chapter 23 (Unconventional Gas Well), 58 Pa.C.S. § 2301. The Pennsylvania Public Utility Commission (PUC) issued a Clarification Order of the *Implementation of the Unconventional Gas Well Impact Fee Act* on December 20, 2012, that included an interpretation of spudding a well for purposes of the impact fee. According to DEP, that order states that

and post drilling (when the rig has moved off). There would also be inspections performed upon Notice of Termination (permit termination) and well site restoration.

Based on DEP's response, we tried to evaluate DEP's performance with regard to timeliness and frequency of inspections of shale gas wells. Specifically, we reviewed inspection data and "SPUD Data Reports," which DEP posts to its website.

DEP's electronic data records cannot be used to measure the timeliness and frequency of its inspections.

Timeliness: In order to analyze the timeliness of DEP's inspections of newly-drilled wells, the drill start date needs to be accurately identified. Within the oil and gas industry, a "spud" date refers to the date that drilling started. The former Oil and Gas Act[44] required operators to provide DEP with 24 hours notice prior to the commencement of drilling.

On its website, DEP provides the public with a "SPUD Data Report" that lists the spud date for all active unconventional wells. (This spud date is the only date associated with drilling activity that is currently provided on DEP's website.) We identified 3,852 shale gas wells with a "spud" date between 2009 and 2011. Since DEP officials indicated that they attempt to inspect shale gas wells "during or immediately after spudding the well," we compared the spud dates to the date of the first inspection after the spud date for each of those wells. Specifically, we obtained the well permit number for each active shale gas well and then searched the eFACTS database (as presented on DEP's website) for the first inspection date associated with each permit number.

the "PUC found that setting conductor pipe into the ground constitutes spudding and that drilling commences as soon as a drill bit penetrates the ground."

[44] Former Section 201(f) of the 1984 Oil and Gas Act, repealed (Act 223), 58 P.S. § 601.201(f); see also Section 3211(f) of the 2012 Oil and Gas Act, 58 Pa.C.S. § 3211(f) (Act 13).

Using that methodology, we found that DEP was not inspecting newly-spud wells timely. In fact, our analysis showed that more than 1,100 of the wells with a spud date between 2009 and 2011 were not inspected for two to six months after the spud date. We also identified 77 active shale gas wells that had no electronically recorded inspection dates associated with those well permit numbers through December 31, 2012, even though the wells had a spud date between 2009 and 2011.

When we presented the results of our analysis to DEP officials, they strongly refuted our conclusion because, according to DEP, we erroneously assumed that the spud date correlated to the date when drilling activity occurred.

DEP officials then explained that operators reported a spud date to DEP, but that date did not necessarily mean that actual "production" drilling began on that date. (Production drilling implies that a drill rig was on the well pad, and active drilling into the targeted shale formations had commenced.)

DEP officials noted that the operator may have actually only placed a "conductor pipe" on that date and may not have begun drilling for production for weeks, or even months, later.[45] DEP explained that setting conductor pipe allowed the operator to secure the DEP permit and the gas lease.

While DEP officials stated that the spud date may not correspond to the start of production drilling for some wells, the possibility exists that the spud date ***could*** be the actual date drilling commenced. When we pressed DEP for the number of times operators reported a spud date that actually corresponded to the commencement of drilling, DEP responded that it could not provide a precise answer without conducting a time consuming manual review of each well record maintained in the paper files at the district offices. A manual record review would be necessary because DEP does not maintain sufficient and reliable electronic data records.

According to DEP, prior to Act 13, inspectors would typically obtain an operator's drilling plans and communicate directly with that operator to ascertain when the critical stages of well

[45] Conductor pipe is the casing string that is usually put into the well first, particularly on land wells, to prevent the sides of the hole from caving into the wellbore. This casing, sometimes called drive pipe, is generally a short length and is sometimes driven into the ground.

construction were scheduled. In other words, DEP relied on communications between the inspectors and the operators to determine when to schedule inspections and did not schedule inspections based on the reported spud dates.

While DEP may believe that the practice of relying on the inspector's communications with the operators is sufficient to ensure the timely inspections of shale gas wells, we disagree. DEP should have some procedure(s) in place that would allow both field supervisors and senior management to review and evaluate electronic data to determine if all active producing shale gas wells are inspected timely during each critical phase of the drilling process. As the primary environmental regulatory agency, DEP should support its own assertions that it is conducting inspections timely, and do so with sufficient aggregate data.

Frequency: While the inspection policy did not contain definitive language regarding the frequency of inspections, the policy does state that an inspection should occur "at least once a year to determine whether compliance with the statutes administered by the Department has been achieved." (See item #14 listed on the table in Appendix E.) As previously mentioned, DEP officials stated that they attempt to inspect every producing shale gas well at least once a year. Therefore, we conducted an analysis to determine if DEP actually conducted inspections of shale gas wells at least once a year.

Our analysis again started with the spud date listed on the SPUD Data Report, and then we reviewed inspection data to determine if active wells were inspected at least once a year. The analysis showed that DEP did not inspect more than 80 percent of the wells with a spud date in 2009 at least once each year from 2009 through 2012. For wells with a 2011 spud date, we found that approximately 40 percent of the wells did not have at least one inspection in 2011 and at least one inspection in 2012.

When we presented the results of our analysis to DEP officials, they again refuted our conclusions because we began our analysis with the reported spud dates. DEP continued to assert that some of those wells might not have needed an inspection in the early years because the wells might not have been drilled for production.

In further explaining why it believed our methodology was flawed, DEP stated that its publically-available data was not designed for such analyses, stating that only a manual review of thousands of its individual paper-based well permit files would yield results on inspection timeliness and frequency. But to date, DEP has not conducted this type of manual review because it would be labor intensive and time consuming. As a result, DEP cannot provide assurance that all active shale gas wells are inspected timely and frequently.

To be clear, DEP was adamant that its electronic data could not be used or relied upon to measure, in the aggregate, its performance in how timely and frequently it conducted inspections. In our opinion, not being able to use electronic data for inspection analysis is unacceptable for an agency that claims its regulatory approach is that of "a world-class leader."[46]

Furthermore, if the data posted on DEP's website is of no value for determining inspection frequency and timeliness—and holding DEP accountable—we question why DEP presents such information to the public instead of presenting clear and unambiguous information on the drilling start dates.

Further evidence that DEP's unreliable data hinders its ability to provide assurance that all active shale gas wells were inspected timely

When DEP refuted our conclusions on the timeliness and frequency of inspections, DEP provided further evidence of the unreliability of its electronic data. As we stated earlier in this finding, during our review of inspection data, we identified 77 shale gas wells that had spud dates between 2009 and 2011 but no inspection recorded in eFACTS through December 2012. When we asked DEP why these wells were not inspected during the audit period, DEP's response actually provided another example of data unreliability, as presented in the following narrative.

DEP initially stated that the wells may have never been drilled; therefore, no inspections were necessary. After reviewing electronic inspection records for 2013 and 2014, DEP amended

[46] DEP, 2013 *Oil and Gas Annual Report*, p.6.

its initial response by stating that the wells were active and were inspected, but the inspection dates were outside the audit period, which ended on December 31, 2012. DEP also provided the following explanation as to possible reasons why the wells had spud dates between 2009 and 2011 but no inspection records until 2013 or 2014:

> This may be a combination of wells being SPUD, but the wells never being drilled; the well not being drilled until a much later date after the SPUD date; the well being inspected, but the inspection information not properly entered into eFACTS; or there may be wells that had been drilled and an inspection was not conducted until much later. We cannot say with certainty the situation in each of these cases.

Because DEP suggested that these wells may not have been drilled, or were drilled much later than the recorded spud dates, we reviewed production data related to these 77 wells to identify if, and approximately when, the wells were drilled. Production data is also reported to DEP and posted on DEP's website; thus, if an operator reported the well as producing gas, then in all likelihood the well was drilled.

We found 50 of the 77 wells had production data at some point during 2009 through 2011;[47] however, six of those wells did not have any inspection recorded in eFACTS. In 43 cases, the first inspection record was in 2013 or 2014, and the remaining well had only one inspection which occurred before the spud date. In these 50 cases, the production data posted on DEP's website shows that the wells were producing for an extended period of time yet the eFACTS inspection data showed no recorded inspections during that same time. In other words, the results indicated that DEP was not inspecting active producing wells timely—or even at all.

Here again, DEP refuted our conclusion, stating that operators could have erroneously reported the production data. Since production data is self reported by the operators and not verified by DEP, that statement may be true for some wells. However, by DEP's own admission, "there may be wells that

[47] Of the remaining 27 wells, 12 wells had no production data from 2009 to 2012, and the other 15 wells had production data in 2012 and/or 2013.

had been drilled and an inspection was not conducted until much later."

Simply put, DEP could not rely on its electronic data to answer our questions about timeliness of inspections. In fact, in response to our questions about the 77 wells, DEP said that it could not state with certainty how timely the wells were inspected without conducting a manual review of each individual well record. If DEP cannot use electronic data to reliably answer questions about 77 wells, and since it refutes all analyses we conducted with the data, we question how DEP can effectively manage the daily activities of its inspectors and hold operators accountable for the thousands of active shale wells in the state.

Without reviewing the individual well records for the 3,852 wells with a 2009 to 2011 spud date (which according to DEP is currently the only method possible to perform a complete and thorough analysis), DEP cannot provide reliable assurance that those active shale gas wells were inspected timely—or at all. Until DEP resolves the fundamental concerns we have about data quality and reliability, we will continue to question any statements DEP makes regarding the timeliness and frequency of inspections for all shale gas wells.

Despite adding several oil and gas inspectors to its staff, DEP did not have sufficient resources to handle the increased demand from the shale gas boom.

We found that the number of inspections that DEP conducted related to shale gas wells increased from 2,418 in 2009 to nearly 15,000 in 2012, or a total growth of 520 percent. Although DEP increased its total inspector complement by 40 percent (from 58 in 2009 to 81 in 2012), with the largest increase occurring in 2010,[48] this increase was not sufficient for DEP to meet the responsibilities of its inspection policy.

[48] DEP's water quality specialists, oil and gas inspectors, and environmental protection specialists are responsible for DEP's compliance monitoring (i.e., inspections). These inspectors conduct inspections of both conventional and unconventional oil and gas facilities. We use the word "inspector" to refer to these three job classifications collectively.

Even with the addition of 20 new inspectors, DEP acknowledged that its staffing levels were inadequate to meet the demands of shale gas development. During the discussion on our inspection frequency analysis, DEP officials stated that all active shale gas wells were not inspected at least once a year because DEP "does not have the resources" to do so. Then, in late 2013, DEP responded to a questionnaire as part of the most recent State Review of Oil and Natural Gas Environmental Regulations, Inc. (STRONGER) review. In its response to this questionnaire, DEP stated "the current level of staffing is ***not*** adequate to inspect oil and gas wells at the frequency envisioned by the 2012 Oil and Gas Act" (emphasis added). DEP also stated that it intends to hire 10 additional inspectors[49], and is proposing to fund these new positions through changes to the permit fees charged for unconventional drilling.

Furthermore, according to DEP, there has been a high turnover rate among inspectors, especially in the Pittsburgh district office. Since it takes a full year for a new inspector to be completely trained, the turnover rate only compounds the staffing deficiency because the inspection schedule slows down each time a new inspector has to be trained.

Without adequate staffing, we question how DEP will be able to meet the demands of the future growth of this industry. Every time a new gas well is drilled in the state, it presents an obligation to inspect that facility for many years into the future. Effective oversight by DEP as the regulatory agency is crucial in order to ensure water quality is not adversely impacted by the shale gas industry.

Summary: DEP must become more accountable with regard to its oversight activities, especially its inspections. DEP can no longer operate with an outdated inspection policy that does not state clear timeframes for when inspections should be conducted. DEP can develop and implement a new policy at any time, but to date, DEP has chosen to operate with an outdated policy that provides a provision that enables the lack of accountability.

[49] A formal workload assessment on DEP's inspectors was outside the scope of this audit. Accordingly, we cannot conclude on the exact number of inspectors DEP should have on staff to ensure all wells are inspected timely and at each critical phase in the drilling process.

Further, with the enactment of Act 13, operators are now required to electronically report to DEP the dates when each critical phase of the drilling process begins. DEP should ensure that it captures each of these dates accurately and posts that information to its website. In this manner, reliable data can be used to measure DEP's inspection frequency and timeliness.

Until DEP is held to measurable criteria—and it then generates reliable and accurate electronic data that can be used in measuring its performance—DEP cannot be accountable. While this fact is certainly detrimental to the public's trust, it is even more damaging to DEP, since it cannot provide reliable assurances that it conducts timely and frequent inspections of shale gas wells.

RECOMMENDATIONS

12. DEP should develop and implement an internal policy that outlines the explicit requirements of timeliness (e.g., within 15 days of siting) and the frequency (at least once annually) of inspections by reemphasizing each critical step in the drilling process.

13. In the meantime, DEP should ensure that it inspects shale gas wells, at a minimum, at least once a year as required by its current policy.

14. DEP should hire additional inspectors to meet the expected demands from shale gas development.

15. DEP should verify that the various drilling dates reported by the operators to DEP actually correspond to the start of each drilling phase so that DEP can ensure that timely inspections are conducted during each critical phase of the drilling process.

16. DEP should record and report publically all dates reported by the operators of the critical drilling stages and then use those electronic records to evaluate its performance with regard to inspections, in the aggregate.

Department of the Auditor General's Evaluation of DEP's Response

DEP disagreed with the finding, but agreed with Recommendations 12 through 16. DEP's response to the report appears in full beginning on page 118.

As with finding two, DEP paradoxically disagrees with our finding, but agrees with the finding's recommendations, at least in part. Similarly, DEP criticized us for focusing our analysis on electronic data as a basis of determining timeliness and frequency of inspections. Yet, in its response DEP stated, "DEP agrees that using the information posted in eFACTS to evaluate its performance with regard to gas well inspections is appropriate." We continue to stand by our methodology and the conclusions made.

In its response, DEP implies that we incorrectly relied on "spud dates" which were captured electronically and reported on DEP's website. This issue is discussed at great length in the audit report. An initial point of clarification is that DEP asserts that we identified spud dates for a sample of wells and then calculated the number of days elapsed from spud date until a well inspection as documented in eFACTS. This statement is incorrect—we did not sample wells, our analysis was based on **all** active, unconventional wells that were spud during the audit period and for which DEP reported detailed information on its website.

As we noted in the audit report, DEP refuted this calculation as DEP indicated that spud date is not a true date related to the "critical stages" of drilling. DEP asserted that its inspections are centered on only critical stages, which are described in Act 13. In support of its argument, DEP stated that many spud dates may have only involved the setting of "conductor pipe." Setting conductor pipe is not an activity which DEP claimed would warrant an inspection, since it is not considered to be a critical drilling stage. Consequently, DEP claims because we relied on spud dates, our analysis was flawed.

We disagree and highlight three important facts for the reader to consider in evaluating the finding:

1. DEP's own instructions for using the spud data report state, "the spud data report is designed to show the oil and gas drilling commence date or 'spud date' reported by the operator to the oil and gas inspector for the county."

2. During a meeting with DEP field staff, which was verified in writing and for which DEP management provided additional written comments to our inquiries, DEP stated that "every effort is made to inspect active wells multiple times including, but not limited to…during or immediately after spudding."

3. The American Petroleum Institute (API) and its *Hydraulic Fracturing Operations—Well Construction and Integrity Guidelines*, issued in October 2009, states the following about conductor casing:

> The first casing to be installed in the well is the conductor casing. Conductor casing serves as the foundation of the well. Two purposes of conductor casing are to hold back the unconsolidated surface sediments and to isolate shallow groundwater. Below the conductor casing there is harder, more consolidated rock. Thus, the conductor pipe keeps the unconsolidated surface sediment in place as the drilling operations proceed. The conductor casing also protects the subsequent casing strings from corrosion and may be used to structurally support some of the wellhead load.

DEP continues to assert that its electronic data cannot serve as the basis for our audit, and that only a well-by-well analysis of thousands of detailed paper files will result in a true assessment of its performance. We believe that DEP's assertions are merely an attempt to move the discussion away from an evaluation of its timeliness—or untimeliness—in conducting inspections of active, shale gas wells; and thus, being accountable to public scrutiny.

Further, DEP claims that the "human element" of the inspection process is independent of any electronic data storage system. We found this argument especially distressing since, by DEP's own admission, it has been hampered by staff turnover and it needs additional staff to complete all inspections. Further, in this technological age, the "human element" must be supported by adequate and reliable electronic information. With the ever growing number of gas wells that DEP is responsible for regulating, it is difficult to understand how DEP management can rely so heavily on paper-based records to ensure that its employees are adequately performing their jobs. Worse yet, because of DEP's reliance on paper records (with little reliable supporting electronic information), if DEP's paper records were ever damaged or lost (e.g., in a fire or flood), DEP's ability to fulfill its regulatory duties would be similarly compromised. From a continuity of government stand-point alone, DEP must do better.

In its response, DEP stated that it will rely on operator quarterly inspections, which will be electronically reported to DEP annually, as a supplement to conducting actual inspections. It is interesting to note that on one hand DEP argues that we made an erroneous assumption that the inspection process will suffer without electronic data, yet on the other hand, DEP argues that its inspection process will now be bolstered by having operators report unverified, operator-conducted inspections to DEP. DEP's response suggests that by allowing the "fox to watch the hen house" there will now be an improvement over DEP's responsibility to have reliable and consistent data regarding its own inspections. We disagree.

DEP repeatedly argues that our report findings are based on how DEP used to be and that today is a new era, thanks in part to Act 13. While shale gas development has certainly brought a new day to the commonwealth, DEP still follows a 25 year-old inspection policy. As DEP notes in its response, "DEP acknowledges that an updated well inspection policy is needed to meet the unique concerns of unconventional gas well drilling and is considering alternatives to its current policy." Implementing an inspection policy is a relatively easy task, yet DEP continues to follow a policy that is more than a generation old and does not address the specifics of shale gas development. DEP cannot delay any further and must take action immediately.

While we are pleased that DEP concurs with our recommendations; it is disconcerting that DEP failed to indicate when it will actually implement the recommendations. Too much time has already elapsed for DEP not to be more proactive, especially in anticipation of the increased scrutiny of gas development by the public, the media, and members of the General Assembly.

Finding Five → **DEP does not use a manifest system to track shale gas waste, but relies upon a disjointed process of utilizing three different reports and self-reporting by operators with no assurances that waste is disposed of properly.**

Key points:

- DEP has not dedicated one office to "follow the waste," and has instead assigned shale gas waste monitoring to two DEP offices (Office of Oil and Gas and the Bureau of Waste Management).
- DEP failed to implement a shale gas waste manifest system, opting instead to rely on self-reported waste data from three different sources.
- DEP does not use the self-reported waste data as a monitoring tool, and DEP does not verify that the self-reported data is accurate and complete.

DEP does not have an effective integrated process in place to follow shale gas waste from the point of generation to the ultimate point of treatment and disposal. Instead, DEP relies on inspectors from two different bureaus to inspect waste as part of other routine inspections.

DEP also relies on the operators, haulers, and treatment facilities to self-report amounts and types of waste generated, transported, and treated. DEP does not cross check the waste data in the reports to follow the waste from beginning to end. In addition, DEP does not verify the accuracy of the self-reported data. As a result, DEP cannot be certain—and cannot assure the public—that shale gas waste has been managed properly and safely.

Shale gas development activities create a substantial amount of waste. Officially categorized as "residual waste,"[50] this waste presents a potential threat to the environment—especially water supplies—as a result of mishandling; improper storage, disposal, and/or transport; spills; or other unintended releases.

[50] Under the Federal Hazardous Waste Regulation, which Pennsylvania incorporates by reference, wastes associated with the exploration, development, or production of natural gas are excluded from the definition of hazardous waste. As such, shale gas development waste is considered to be and regulated as residual waste. *See* 35 P.S. § 6018.101 *et seq*., known as the "Solid Waste Management Act" and particularly, Section 103 (relating to Definitions) of that act, 35 P.S. § 6018.103.

Shale gas development waste is generally classified into two categories:

- *Drilling waste*. This type of waste consists of soil and rocks that are returned to the surface during the drilling process and may contain drilling muds and other lubricants/chemicals used during drilling.
- *Flowback/produced waste*. This type of waste, often called wastewater, consists mostly of brine and other wastes that return to the surface after the hydraulic fracturing process.

DEP does not have an integrated system to track and verify shale gas waste disposal.

Both categories of waste from shale gas development activities need to be properly handled and disposed of in accordance with federal and state laws and regulations.[51] Monitoring operators' compliance with these laws is DEP's responsibility. However, DEP does not have an integrated management system to aid in this monitoring. DEP relies on staff from two different offices to monitor waste.

Office of Oil and Gas Management

- This office is responsible for monitoring waste generated, handled, and stored at oil and gas sites.
- This monitoring is part of the routine inspections conducted at the well sites.

Bureau of Waste Management

- This bureau is responsible for the monitoring and inspection of all waste disposal and/or transportation activities once waste leaves the well site.
- This bureau is responsible for the management of all residual waste, not just residual wastes from oil and gas activity.

[51] In addition to the Solid Waste Management Act, 35 P.S. § 6018.101 *et seq*., cited previously, wastes associated with shale gas development activities are also regulated under 58 Pa.C.S. § 3201 *et seq*. (2012 Oil and Gas Act).

- Monitoring the transport and disposal of shale gas waste (residual waste) increased the workload and responsibilities for this bureau.

Because of this division of duties, DEP does not have a single and uniform process in place where one office follows the waste from the point of generation to the ultimate point of disposal. Following the waste from "cradle to grave" in a unified, integrated process helps to ensure that no adverse impacts to the environment, including water quality, occur from the mishandling and improper disposal of wastes.

To that end, a study[52] conducted by the U.S. Department of Energy in 2011, which included the Marcellus Shale formation in Pennsylvania, stated that a key component to water and waste management is,

> Adoption of a life cycle approach to water management from the beginning of the production process (acquisition) to the end (disposal); all water flows should be tracked and reported quantitatively throughout the process.[53]

DEP relies upon self-reported waste data from three different sources rather than a manifest system.

We found that DEP does not operate a true "manifest" system for shale gas waste. A true manifest system would track waste from gas wells from the first use of the water to the final disposition of the wastes, including wastewater. An effective system requires that each load of waste is tracked from generator to hauler to disposal site.

While the use of a manifest system is not required by law for shale gas activities in Pennsylvania, implementation of such a system is a strong regulatory action that DEP could institute in

[52] U.S. Department of Energy, Secretary of Energy Advisory Board, Shale Gas Production Subcommittee 90-Day Report, August 18, 2011.

[53] The life cycle of water starts with clean, fresh water and ends with wastewater. We refer to this wastewater as "waste" throughout this finding.

an effort to thoroughly track waste and its disposal. In fact, in the U.S. Department of Energy report mentioned above, the shale gas production subcommittee recommended that shale gas regulators, including DEP, should develop a manifest system for tracking all of the waste.

DEP officials have stated that they do not maintain a manifest system for shale gas waste because such a system would be duplicative to the self-reported waste data that it receives from operators, haulers, and disposal facilities. However, the harm in not instituting a manifest system is that DEP does not have *one* unified and integrated system to track waste, and as we discuss below, DEP does not know if the self-reported data is accurate and reliable.

DEP fails in its oversight role by not using the self-reported waste data as a proactive monitoring tool.

State laws and regulations require DEP to collect waste data from shale gas well operators, transporters, and disposal facilities. This information is self reported to DEP. Shale gas operators report semi-annual data to DEP electronically, whereas transporters and disposal facilities report data annually. These reports identify the type and volume of waste generated and how that waste was managed.

While reviewing three different sets of self-reported data is far more cumbersome than having a manifest system, this self-reported waste data has the potential to provide DEP with a tool for proactively monitoring waste generation, transport, and disposal.

However, we found that DEP does not review this self-reported data and use it as a management tool for its oversight role over shale gas waste. Further, given the fact that DEP lacks a sufficient number of oil and gas inspectors that can inspect waste at the well sites (see Finding Four), the review of operator-reported data becomes increasingly vital since it provides one layer of assurance that operators are complying with environmental laws and regulations.

DEP officials told us that they do not have sufficient staff to routinely perform cross checks among the three different sets of self-reported data. However, they stated that if DEP were to receive a complaint that a particular generator, transporter, or landfill was not complying with the applicable requirements, then DEP would begin an investigation, which would include cross checking the information from each data source for verification.

If DEP officials believe a manifest system is not needed because it would be duplicative to this self-reported data, then DEP officials must find the staff and the time to review the self-reported waste data and cross check the three different sources of data. Otherwise, DEP's current system, absent a manifest, is not an effective monitoring tool.

By not reviewing and cross checking the self-reported data, not only is DEP not following the waste generated from shale gas activities, it is not proactive in discouraging improper, even illegal, disposal of waste.

DEP does not verify that the self-reported data is accurate and complete.

The self-reported waste data is posted to DEP's website for public access and use.[54] DEP publicizes the website as:

> A first-of-its-kind tool that provides the public with greater insight into oil and gas operations across the state. This application is designed to make the activities of drilling companies and their business partners more transparent.

We found that DEP does not verify the accuracy of the self-reported data. DEP information technology officials stated that they can "spot-check" the data for basic redundancy checking (e.g., double reporting, etc.), but these efforts do not ensure that the information is accurate and complete.

In other words, DEP acts merely as the pass-through for this data—missing an opportunity to use the data as a monitoring

[54] https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Welcome/Agreement.aspx.

tool and disregarding the possible misrepresentation of waste information that could occur when the self-reported data is inaccurate. As we discussed elsewhere in this report, here again DEP is not providing the transparency and accountability the public needs.

Further, before users can use the data, they must first agree to a DEP disclaimer, which states the following, in part (underline emphasis added):

> *The Oil and Gas Act reporting is a self-reporting system, meaning that data is reported from producers to DEP as required by law. All production data is posted as it was received from the unconventional well operators. <u>DEP does not independently verify the data before it is posted</u>.*
>
> *While the Oil and Gas Act requires accurate and on-time data reporting by producers, and the producers and DEP endeavor to correct any errors discovered after the data is posted, DEP makes no claims, promises or guarantees regarding the accuracy, completeness or timeliness of the operators' data that DEP is required to post.*
>
> *DEP expressly disclaims any liability for errors or omissions related to the production data contained within these reports. No warranty of any kind is given by DEP with respect to the production data contained within these reports posted on its website.*
>
> *I have read and understand the above informational statement.*

Users must then click either "agree" or "disagree." Agreeing to the above statement allows access to the data, while clicking "disagree" forces an exit from the website and returns the end-user to DEP's main website.

However, once a user gains access to the data, there is no assurance that it is complete and accurate. DEP's lack of a thorough verification of the self-reported data is another example where DEP falls short in meeting the public's need for transparency and accountability over shale gas monitoring.

The data is valuable to those seeking information about shale gas development. The website postings allow end-users to view historical oil and gas well production information from conventional shallow wells and from newer unconventional wells, as well as data on the waste each operation produces.

But when that information is not accurate or complete, DEP erodes the public's trust, not only on how DEP manages data, but also—and more importantly—on how DEP monitors waste

and ensures water quality is not adversely impacted. If the information is wrong, how does anyone know what really happened to the waste?

DEP's failure to verify the accuracy of self-reported data from shale gas operators can have significant and potentially dangerous implications. If these entities know that ***DEP is not***: (1) inspecting timely; (2) tracking the lifecycle of the water and waste; and (3) verifying the accuracy of self-reported data, then the risk that these entities may act unscrupulously with waste handling is elevated.

Given the rapid growth and size of Pennsylvania's shale gas activities, it may be reasonable for DEP to rely on operator-reported data as a first layer of compliance monitoring. However, since DEP already lacks a sufficient complement of inspectors to actually conduct inspections, DEP is failing in its regulatory function when it does not verify data it receives and in turn uses that data as a waste monitoring tool.

RECOMMENDATIONS

17. DEP should implement a true manifest system as recently recommended by the U.S. Department of Energy Advisory Board in an effort to thoroughly track waste and its disposal.

18. In the meantime, DEP should review and cross check the self-reported waste data from drillers, haulers, and disposal facilities so that DEP can track the water and wastes related to shale gas drilling to ensure that operators handled waste properly and that the waste was ultimately disposed of properly and in compliance with all pertinent laws.

19. DEP should verify the self-reported waste data it obtains from operators, haulers, and disposal sites for completeness and accuracy before posting the data on its website.

Department of the Auditor General's Evaluation of DEP's Response

DEP did not agree with the finding and disagreed with Recommendations 17 and 19, but agreed with Recommendation 18. DEP's response to the report appears in full beginning on page 118.

DEP opposes the creation of a manifest system for oil and gas waste, stating in its response that the potential benefits would be outweighed by the corresponding administrative, staffing, and oversight costs of such a system. We disagree and believe that a single, unified, and integrated system would be a benefit to DEP in supporting its mission. The cost of such system should not be borne by the citizens, but by the waste generators.

As we noted in the report, the law does not currently require DEP to have a manifest system. However, we continue to believe that DEP could improve its accountability and transparency by following the advice of the U.S. Department of Energy and develop a system to track shale waste "cradle to grave."

We continue to stand by our recommendation that DEP review and cross check the self-reported data from drillers, haulers, and waste disposal facilities. In its response, DEP indicated that it utilizes random cross checks when "practical." In our opinion, DEP should be doing cross checks routinely rather than only when *practical*. Routine and random cross checks would demonstrate DEP's willingness to be proactive rather than reactive in its regulatory approach.

Finding Six → DEP's website lacks transparency and accountability to the public.

Key points:

- DEP provides limited information on its website, raising questions about the transparency of DEP's oversight of shale gas drilling and impacts to water quality.
- DEP's fragmented website hinders the public's attempts to answer key questions about shale gas drilling.
- DEP does not provide the public with information related to complaints about private water supplies impacted from shale gas drilling.

DEP's website provides a disjointed, ineffective, and incomplete view of shale gas drilling information and water impact cases to the public.

Users must attempt to navigate a spider web of obscure "interactive reports" and online eFACTS' data queries to find information about shale gas development and potential impacts to water supplies.

As a result, the public is left questioning DEP's monitoring role to ensure proper drilling and water quality protection since DEP's current public reporting system does not provide sufficient transparency over shale gas drilling activities.

DEP provides limited transparency with information posted to its website.

In describing DEP's transparency to the public and in fulfilling its mandates under the various federal and state environmental laws, the current DEP secretary recently noted the following:

> There was this sense—at least publically—we [DEP] were very tight with information and not necessarily transparent in what we were doing. No offense, our website looked like the *Encyclopedia Britannica*. It was not dynamic. It did not engage the public. We've tried very hard to overhaul that website.[55]

[55] "DEP chief says he's tried to change the tone at the agency," *National Public Radio*, March 18, 2014.

Despite this purported "overhaul," we found that DEP still has not attained transparency with shale gas drilling information posted on its website. In fact, our information technology audit team found the site to be thoroughly confusing, requiring them to access several different links to obtain information, spending an inordinate amount of audit hours in trying to piece necessary elements all together. Given the difficulties our professionals experienced, we can only imagine how thoroughly confused the casual user would be.

For example, although the DEP website attempts to accumulate and report on key information (i.e., permits, spuds, inspections, and production), the resulting reports provided do not link to one another. A user must access multiple reports in order to accumulate all of the data DEP makes available about one well. There is no one place on the website where the public can look to see all the information DEP has made available and accumulated about a particular well.

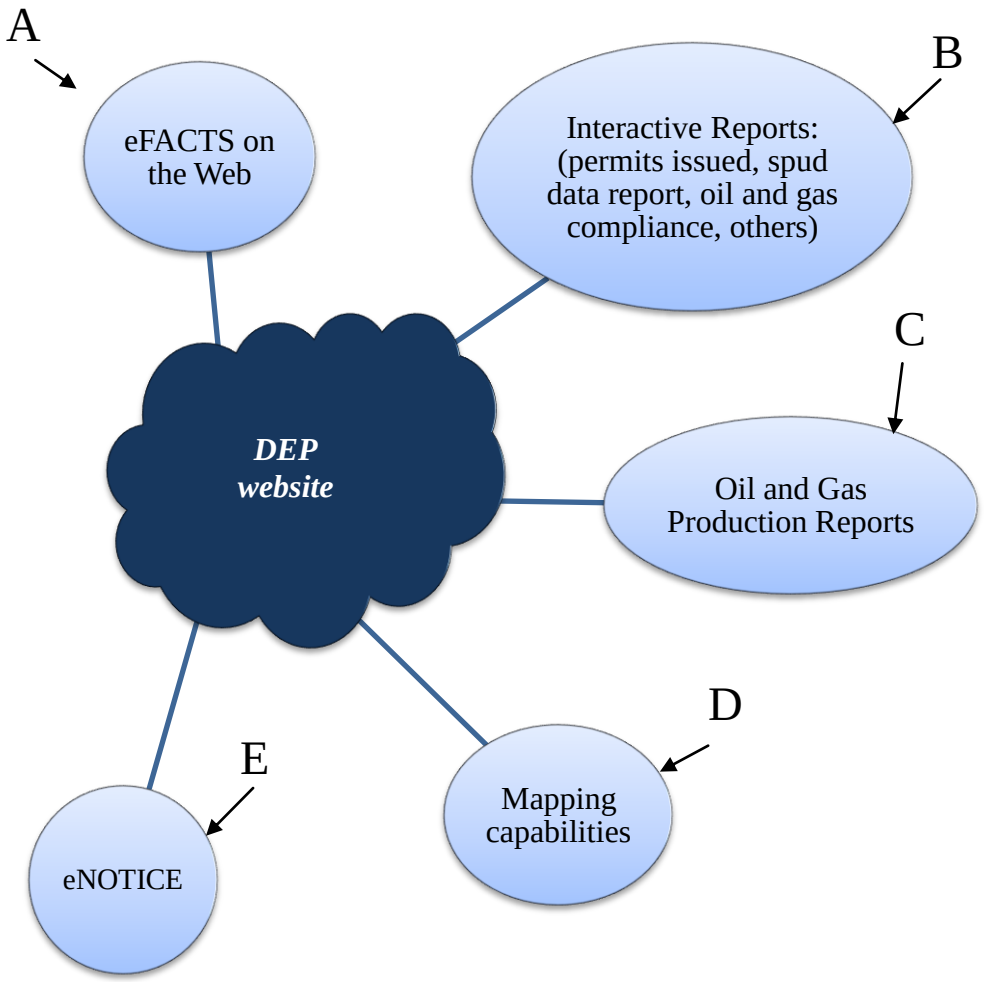
The difficulty of extracting information from the website led researchers at the Carnegie Museum of Natural History to develop an ongoing project to combine six of DEP's publically-available datasets.[56] The researchers combine information about inspections, spud dates, permits, production, and waste. They make this dataset available to researchers and government agencies who agree to certain conditions when receiving the data. This combined database allows researchers to answer key questions such as, "How many producing wells have received an inspection in the past year?"

DEP's publically-available website fails to provide this level of cohesive transparency. The researchers at Carnegie have demonstrated that it is possible to provide a more comprehensive picture of shale gas drilling in Pennsylvania, if one has the knowledge and time to compile the data. DEP should consider providing the public with easy-to-access information, as well.

[56] Whitacre, J. V., *2013*. Carnegie Museum of Natural History Pennsylvania Unconventional Natural Gas Wells Geodatabase (v. *2013-Q1*) [computer file]. Pittsburgh, PA: Carnegie Museum of Natural History. Available download: URL: http://www.carnegiemnh.org/science/default.aspx?id=18716. Accessed: August 2013.

The following exhibit highlights some of the problems we found with the information on DEP's website related to shale gas drilling activities.

High-level overview of the numerous search tools used to access public information on shale gas development activities from DEP's website



Source: Developed by Department of the Auditor General staff from review of DEP's website.

The following section describes each of these website features and discusses how each feature does not provide transparency to the public. (The lettered sections below correspond to the letters on the diagram.)

A. eFACTS on the Web[57]	
What is this feature?	**What are the limits of this feature?**
Users can search eFACTS to obtain information about authorizations (permits), clients (well operators), sites (well pads) and facilities (wells). Users can also search eFACTS to find inspections, violations, and enforcements. Finally, users can search compliance information, as well as limited permit information, on each "client" that DEP monitors. The data available on eFACTS applies to all DEP programs.	1. Because the data applies to all DEP programs, it is difficult to isolate searches specific to shale gas activity. 2. Search functions[58] require the user to already know certain key identifiers, such as a facility ID number or client ID number. 3. If a person does not know certain key identifiers, users must use a name search function to find them. But this name search can be cumbersome since clients (operators) may be listed differently in eFACTS (e.g., some clients are listed as "non-Pennsylvania corporation," but also listed as "Pennsylvania corporation"). 4. Data is presented as "read-only" and cannot be downloaded or aggregated to meet the users' needs. To download data, users must use another feature of the website, "Interactive Reports," but no link is provided from "eFACTS on the Web," and no mention is made that a person could use the Interactive Reports for data downloads.
B. Oil and Gas Interactive Reports[59]	
What is this feature?	**What are the limits of this feature?**
This feature allows the public to produce specific reports from eFACTS about oil and gas drilling. Available reports include: permits issued detail report, permitted well inventory, oil and gas compliance report (inspection reports), SPUD data report (new wells drilled), wells drilled by county,	1. Each interactive report contains only information about that particular subject. For example, the permitted well inventory does not include inspection, violation or enforcement information. 2. The inspection data presented does not

[57] eFACTS on the Web is found at http://www.ahs.dep.pa.gov/eFACTSWeb/default.aspx.
[58] See Finding Eight for a discussion on eFACTS design limitations.
[59] Interactive reports are found through the DEP Oil and Gas Reporting website at http://www.portal.state.pa.us/portal/server.pt/community/oil_and_gas_reports/20297.

wells drilled by operator, etc. The "Oil and Gas Compliance Report" allows users to see information entered from inspection reports of each oil and gas well, client, pipeline, or other facility, including shale gas activities. Users may search the data by date ranges, conventional or unconventional wells, inspection type, inspections with violations, and operator, among other preset query ranges. (DEP provides five pages of instruction on how to query compliance data.) *Note: See Finding Seven for details about the data entry errors we identified on the Oil and Gas Compliance Report which compromises the usefulness of the information to the public, as well as information about what is NOT included in this feature.*[60]	include certain key information about the well, i.e., spud date (when drilling began), whether the well is considered an active or inactive well, or whether the well is producing. 3. There are no links to the mapping feature or to other reports on the website such as production reports or waste data submitted by the operators. 4. If an inspection record includes penalties, when the website user downloads the report to a spreadsheet, penalties assessed may be overstated. For example, we found that the DEP database related each violation with a penalty amount if there was enforcement. On downloads from the eFACTS website, the penalty displays beside each individual violation. This erroneously suggests to the public that a certain penalty, e.g., $5,000, was paid per violation, when in reality a lump sum of $5,000 was paid for all violations.
C. Oil and Gas Reporting Website[61]	
What is this feature?	**What are the limits of this feature?**
This feature allows the public to view "Oil and Gas Production Reports," which are populated from the data submitted by well operators to comply with Act 13. The data available includes both well production data (i.e., amount of cubic feet of natural gas produced by each well) along with waste information generated by each well.	1. Before accessing Oil and Gas Production Report data, users must agree to a DEP "disclaimer" that states DEP did not verify the data. 2. The unverified data presented in the "Oil and Gas Production Report" is not linked to the eFACTS data. As a result, there is no easy way for a user to compare the production and waste data presented to the inspection data.

[60] 58 Pa.C.S. § 3262, which requires DEP "to post inspection reports on its publicly accessible Internet website."

[61] Oil and Gas Production reports are found through the DEP Oil and Gas Reporting website at https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Welcome/Agreement.aspx or can be accessed through the Oil and Gas Reports website at http://www.portal.state.pa.us/portal/server.pt/community/oil_and_gas_reports/20297 by clicking on "Oil and Gas Production Reports."

D. Mapping capabilities	
What is this feature?	**What are the limits of this feature?**
DEP offers two separate mapping capabilities. a. The first mapping tool, which is available under the Office of Oil and Gas' "public resources," sends users to eMapPA.[62] This application is tied to eFACTS data, in that users can overlay certain information on the map. b. The second mapping tool is known as "PA Oil and Gas Mapping."[63] According to DEP, this application allows users to locate both conventional and unconventional wells, including producing and non-producing wells, based on information from permit applications, authorization requests, and operator submitted reports. This map version provides a true geo-spatial representation of well information.	1. Offering two different mapping tools could cause confusion and frustration for the public. 2. The second mapping tool is known as "PA Oil and Gas Mapping."[64] According to DEP, this application allows users to locate both conventional and unconventional wells, including producing and non-producing wells, based on information from permit applications, authorization requests, and operator submitted reports. This map version provides a true geo-spatial representation of well information. 3. The eMapPA application is nearly 10 years old and not user-friendly. 4. When trying to tie eMapPA to eFACTS data, a user is expected to know the facilities they are looking for on eFACTS.[65]
E. eNOTICE	
What is this feature?	**What are the limits of this feature?**
DEP provides this service for persons who want additional information on specific permit decisions, draft technical documents, regulations, and land recycling notices. End-users enter an e-mail address and DEP alerts users to changes for those requested items.	1. eNOTICE does not include a notification about completed inspections. 2. If a notification about completed inspections were to be included, ideally, the e-mail notification would include a link to the completed inspection report.

[62] http://www.emappa.dep.state.pa.us/emappa/viewer.htm.
[63] http://www.depgis.state.pa.us/PaOilAndGasMapping/.
[64] http://www.depgis.state.pa.us/PaOilAndGasMapping/.
[65] DEP notes the following about eFACTS queries using eMapPA: The eFACTS Query tool is designed to query the database which supports DEP's permit activities. The eFACTS database is over 300,000 records; however, eMapPA only shows roughly one-third of all the sub-facilities that exist in the database.

DEP fails to provide adequate transparency when there are any adverse impacts to water supplies from shale gas drilling.

DEP does not provide the public with information related to complaints about water supplies impacted from shale gas drilling. Without this information, it is impossible for the public to know where and when water supplies are contaminated. The following sections provide two distinct categories of information that are missing from DEP's website.

Complaint information not posted to DEP's website.

The complaint tracking system (CTS) is used to track incoming complaints and to document DEP's response to those complaints; however, the information in CTS is not available to the public.

While we understand that DEP cannot publicly post all information in CTS due to confidentiality requirements (complainant name and address information is confidential),[66] DEP could at a minimum post aggregate information about complaints, such as the number of complaints it receives, the number of complaints that result in an investigation, the number of water supplies—both public and private—impacted by shale gas drilling, etc. To be clear, we are not suggesting that DEP post each complaint verbatim that it receives, as we recognize that some complaints are unfounded and could even be alarmist in nature. But once the complaint is investigated, DEP could provide the above-mentioned aggregate information.

Further, DEP could post "determination" letters[67] on its website so that the public could see the results of DEP's complaint investigations, redacting confidential information where necessary. Currently, the only means the public has to see determination letters is to spend considerable time to wade

[66] Under 65 P.S. § 67.708(b)(17), Pennsylvania's Right-to-Know Law, complaints and other records related to a non-criminal investigation are exempt from access by a requestor.

[67] Determination letters are issued after a complaint investigation stating whether the water supply has been impacted by shale gas drilling (positive determination) or not (negative determination).

through confusing and, in some cases, voluminous paper files at DEP's district offices.[68]

A government agency responsible for environmental regulation and protecting the environment should provide determination letters and aggregate complaint information to the public to be as fully transparent and accountable as possible. As a protector of the environment and the source for environmental-related information, DEP must provide citizens with as much information as it can to ensure the public that their water supplies are being protected.

Posting of confirmed cases of water supply contamination.

Under Act 13, DEP is required to "…publish, on its Internet website, lists of confirmed cases of subterranean water supply contamination that result from hydraulic fracturing."[69]

To date, DEP has not posted such information on its website because, according to DEP's narrow interpretation of this portion of Act 13, there has never been such a case. In response to our inquiry of how DEP interprets the reporting requirement, DEP noted the following:

> Subterranean water supply is not a defined term in the 2012 Oil and Gas Act [Act 13] or 25 Pa Code Chapter 78. DEP interprets 'subterranean water supply' as fresh groundwater. Fresh groundwater is 'water in that portion of the generally recognized hydrologic cycle which occupies the pore spaces and fractures of saturated subsurface materials' (58 Pa. C.S. §3203; 25 Pa Code § 78.1). Accordingly, a case of subterranean water supply contamination that results from hydraulic fracturing would occur where the act of stimulating a well by hydraulic fracturing contaminates fresh groundwater. To date, there are no documented cases in Pennsylvania of fresh groundwater contamination resulting from hydraulic fracturing. Should the Department become aware of any such cases, it will make this information available on its website.

[68] When members of the public review determination letters at the district offices, the names of the complainants are redacted.
[69] 58 Pa.C.S. § 3218(b.4). [Emphasis added.]

To the letter of the law, DEP is correct in stating that there have been no definitive confirmed cases of ground water contamination from hydraulic fracturing; however, DEP makes this assertion through a narrow interpretation of the term "hydraulic fracturing." In technical terms, hydraulic fracturing applies to just one stage of a highly industrial process, which occurs after site construction, drilling, well casing, and cementing are complete.

The phrase "hydraulic fracturing" is also used informally to describe the entire process of shale gas extraction including, but not limited to, site construction, drilling, and hydraulic fracturing. Therefore, under DEP's narrow interpretation, it would not be required under Act 13 to publish on its website contamination cases resulting from activities related to hydraulic fracturing (e.g., site construction, drilling, transportation, impoundments, etc.).

We believe the General Assembly may not have realized the implications of utilizing the very specific terms of "confirmed cases" and "hydraulic fracturing" and may have unknowingly hampered, or even made, the provision of this law ineffectual.

As the state's environmental regulator, DEP should take steps to post information on its website to make the public aware of every credible case of subterranean water supply contamination from **any oil and gas related sources whatsoever** (including well pad construction, drilling, hydraulic fracturing, waste storage, pipelines, etc.).

We are firmly of the opinion that the public deserves better information, access to that information, and transparency, from DEP with respect to impacts to water supplies. Without this information, DEP's lack of transparency leaves the public with no assurance that water contamination is being reported and addressed and that water supplies are protected.

RECOMMENDATIONS

20. DEP should elevate its level of transparency to the public by disclosing more pertinent information on its website. The following changes should be made on the website to improve transparency related to DEP's monitoring of shale

gas development activities and their impact on water quality:

a. Provide an "Oil and Gas Public Reports" button on the main webpage to provide an easy access portal to all of the reports available to the public that are related to oil and gas activities in the state. Each report should be clearly labeled with hyperlinks to instructions for using the report.
b. Incorporate a feature that allows users to search "eFACTS on the Web" specific to shale gas activities.
c. Make the name search function consistent on "eFACTS on the Web" so that an operator can be easily identified, which is necessary to obtain certain ID numbers to search eFACTS.
d. Link the eFACTS data to the "Oil and Gas Compliance Reports" inspection data and to the "Oil and Gas Production Reports" so that production data can easily be tied to other information presented.
e. Eliminate the duplicative mapping features on the website, or if both mapping tools are deemed worthy of maintaining, update the eMapPA application to make it more user-friendly with regard to eFACTS queries.
f. Provide a notification about completed shale gas inspections with the eNOTICE feature and include a link to the completed inspection report.
g. Include complaint information, in the aggregate, such as the number of complaints received, the number of complaints that resulted in an investigation, the number of water supplies impacted by oil and gas activity.
h. Post determination letters on the website, with complainant identifying information and information about precise locations of water supplies redacted.
i. Post information to make the public aware of any credible cases of subterranean water supply contamination from any oil and gas related sources whatsoever, including well pad construction, drilling, hydraulic fracturing, waste storage, pipelines, etc.

21. The General Assembly should consider amending the provision to require DEP to post information on its website regarding not only definitive confirmed cases, but also any probable cases with credible evidence that oil and gas activity may adversely impact water supplies, whether public or private.

Department of the Auditor General's Evaluation of DEP's Response

DEP disagreed with the finding but agreed with Recommendations 20(a) through 20(e) and 20(g). DEP disagreed with Recommendations 20(f), 20(h), and 20(i). DEP took no position on Recommendation 21. DEP's response to the report appears in full beginning on page 118.

DEP claims that, "Although DEP's website does not provide the public with the ability to instantly access the information DEP collects and electronically maintains, the Auditor General erroneously concludes that the website lacks transparency and accountability to the public." DEP further contends that its file review process, by which individuals can make arrangements at the regional office "to review the hard-copy file for the well" is a sufficient means to ensure complete transparency.

We disagree with DEP's assertions and we stand by our finding. DEP's website is a spider-web of links and data reports, none of which provide a reliable, easily understandable, and accessible means to review data. We refer readers to Findings Four and Seven as prime examples of this dysfunction.

While it is true that DEP's website is a vehicle by which DEP provides accountability and transparency, we believe that because none of the data that DEP's posts online can be easily aggregated for analysis, DEP is not being as transparent as it believes it is. DEP stated that it is considering adding links to its website, but a continuation of DEP's "spider web" of links is not a real solution—a properly developed website is the better solution. Here again, DEP gives the appearance of providing accountability and transparency but until DEP actually does more than consider changes we will continue to question DEP's commitment to this goal.

Furthermore, while we concur with DEP's assertion that the public has access to paper files located at the regional offices, it is unrealistic for DEP to think that all interested members of the public would have the means to travel to these offices, which could be hours away, and have the ability to visit the offices during limited operating hours. Another point to consider is that even if a person travelled to a district office to review records, there is no assurance that the well records would be complete or even could be located as we report in Finding Seven.

Other state agencies with regulatory functions have greatly expanded their information sharing capabilities, and we believe DEP can also provide better service to the public in this regard. For example, kennel inspections (to include a complete duplicate of the inspection form) and restaurant inspections can be easily accessed from the Department of Agriculture's website. The public deserves at least this same, if not more, accessibility regarding well records and inspections from DEP's website.

While DEP agrees with our recommendation to post aggregate complaint information, we take issue with DEP's assertion that "DEP currently provides information related to water supply enforcement actions on its public website and regularly responds to press inquiries requesting aggregated water supply complaint information." DEP *may currently* be providing such information, but we must temper DEP's claims of renewed accountability and transparency to the public and the press with a discussion of its past performance.

In fact, the issue of access to positive determination letters and resulting administrative orders was the very basis of a recent Right-to-Know Law (RTKL) suit between a newspaper reporter who wanted such information and DEP, who contended in part that it could not produce the requested information.[70] Ultimately, the courts ruled that DEP was required to supply the information to the reporter and admonished DEP, in part, by stating that if DEP had "undertaken the search that is was required to perform to meet its obligations under the RTKL, it would have located the required records and would have been able to discern any applicable exemptions…"[71] In short, we interpret this statement by the court as a conclusion that DEP's poor recordkeeping was in no way an excuse for lack of accountability and transparency. Had DEP exhibited explicit transparency then, a significant amount of time and resources would not have been wasted by the court.

With regard to DEP's posting of confirmed cases of subterranean water supply contamination from any oil and gas

[70] *Com., Dep't of Envtl. Prot. v. Legere et al*, 50 A.3d 260 (Pa. Cmwlth. 2012), Recons. Denied (Aug. 30, 2012).
[71] 50 A.3d 260, 267.

related source, we continue to disagree with DEP's position that it complies with Act 13. While DEP may be technically correct in its interpretation of the law, we still believe that DEP does not comply with the spirit of the law. We contend that the public deserves to have access to information about all confirmed cases of water supply contamination from any oil and gas related source; therefore, DEP must find a way to post this critical information on its publically accessible website.

In its response, DEP ultimately concludes that its "goal is that all records related to unconventional oil and gas activities will eventually be submitted to the Department and maintained in an electronic format that is easily accessible to the general public." As with many of DEP's responses to our findings and recommendations, if DEP agrees with the recommendation, then it would be more effective and efficient for DEP to find the means to implement the recommendation, rather than arguing the premise of the finding.

Finding Seven → DEP failed to post online inspection information that is accurate and meets statutory requirements.

Key points:

- DEP is not transparent and accountable to the public when it posts inaccurate and incomplete inspection reports to its website.
- 25 percent of the inspection reports we reviewed contained errors in the information posted to eFACTS.
- 76 percent of the inspection reports we reviewed did not have DEP inspectors' comments fully listed on the website.
- DEP's online reporting does not comply with statutory requirements.

DEP posts inspection reports on its website, eFACTS.[72] However, we found that this information is not complete and, in some cases, contains errors.

Inspection information presented on DEP's website is critical to how the public monitors shale gas development, and it is where the public is supposed to see inspection results, as well as related violations, enforcements, and penalties.

When DEP fails to provide accurate and complete inspection information to the public, DEP is not transparent and accountable to the public. Given the significance of shale gas development activities and the potential impacts on water quality for Pennsylvania's citizens, it is critical for DEP to provide the public with timely, accurate, and complete inspection reports on its website.

Although DEP's website indicated certain oil and gas inspections had been completed, DEP could not properly account for those inspections in its files.

Because information related to DEP's inspection reports as posted on DEP's website is critical to transparency and accountability, we tested the accuracy of the website information by comparing it to actual hard copy inspection

[72] Information related to DEP's oil and gas inspection reports are found on the Oil and Gas reports webpage under the heading "Oil and Gas Compliance Report" (http://www.portal.state.pa.us/portal/server.pt/community/oil_and_gas_reports/20297.

reports completed by DEP's inspectors and filed at the oil and gas regional offices.

We had originally selected 180 inspection reports (60 from each of the three oil and gas regions) to test. As explained below, our test results were based on our review of only 168 inspection reports because DEP could not locate all of them.

During our initial on-site file review, DEP staff could not locate hard copies of 26 of the 180 inspection reports we requested. After several weeks of searching, DEP staff found some of the missing inspection reports, but, ultimately, DEP could not locate a paper copy for 12 of the 180 inspection reports.

DEP officials stated that three of the missing inspection reports were "administrative reviews," thus no resulting hard-copy inspection reports were required. According to DEP, an "administrative review" inspection is used when an inspector conducts a review of files, such as looking at annual production reports, bonding documents, etc.

DEP's explanation for these three missing inspection reports is contrary to DEP's own policy, *Compliance Monitoring of Oil and Gas Wells and Related Facilities and Activities*, which states the following:

> DEP staff will document inspections of facilities, reviews of records or operations, and complaint investigations. Inspections will be documented on standard Department forms, or with site-specific reports (e.g., gas-storage fields).

Because DEP's own policy says that standard forms should be used, including times in which staff "reviews records," inspection reports should have been completed for these three "administrative reviews." In other words, regardless of the type of inspection conducted at the oil and gas facility, DEP should consistently use an inspection report to document the results of the inspection.

The other nine missing inspection reports that DEP officials could not locate were for complaint inspections, routine inspections, and drilling/alteration inspections. Because the hard copy inspection report constitutes the official record of a

DEP inspection, these missing inspection reports are lost evidence of DEP's actions in monitoring the well. Further, given the significant turnover in inspection staff that DEP has experienced in recent years, it is possible that the inspectors who completed these inspections have left the department; thus, there may be no "institutional memory" to even recall what happened at the inspection site.

More than 25 percent of the inspection reports we reviewed contained errors in the information posted to eFACTS.

For those 168 inspection reports that DEP located, we found that the website information did not match the information on more than 25 percent, of the hard copy inspection reports in numerous different key data fields. These data fields are critical since these are the fields the public would use to query and search the data, such as operator name, county, or municipality. Data errors prevent the public from obtaining necessary information about shale gas development activities. The following table presents our findings related to data errors.

Number and type of errors found between actual hard-copy inspection reports and the corresponding data posted to DEP's website

Data Field	Meadville District 56 inspections reviewed	Pittsburgh District 54 inspections reviewed	Williamsport District 58 inspections reviewed	Totals
	(number of error occurrences)			
Operator Name	2	6	4	12
Inspection Record Number	4	4	2	10
Inspection Date	4	2	2	8
Inspection Type	10	2	4	16
Permit Number	2	none	5	7
Region	5	none	4	9
County	9	1	5	15
Municipality	10	7	8	25
Description Results	1	2	2	5
Total number of reports with errors	**17/56**	**12/54**	**20/58**	**49/168**

Source: Developed by Department of the Auditor General staff from review of 168 inspection reports and corresponding information on DEP's website. We cannot ascertain the completeness or accuracy of DEP's data. See Appendix A for more information.

These errors are primarily attributable to the fact that DEP's inspectors record every aspect of the inspections on paper and then keystroke the results into the eFACTS database at a later time. Further, we found that there is no standard procedure for how inspectors record the results of their inspections. For example, some inspectors write notes in a notebook and then later use those notes to complete the actual DEP inspection reports. Other inspectors may use a blank inspection report and record their observations directly into the report while conducting the inspection.

We found that entering the inspections into eFACTS requires the inspector to take the paper copy of the inspection and then retype the information into the eFACTS input screens. Not only is this a duplicative process, it is also one that increases the likelihood for data entry errors. Once entered into eFACTS, the data is then used to populate other web-based applications found on DEP's website (see Finding Six).

Due to budget constraints, DEP's inspectors have few information technology resources available to them in the field; therefore, field inspectors must return to their respective field offices to complete paper work (i.e., enter their inspection results into eFACTS, file necessary inspections, etc.).[73] We found that inspectors can spend anywhere from one to one and a half days a week in the office completing paper work. While it is inevitable that inspectors will have to return to the field office at some point, spending up to 30 percent of their time on paper work leads to an inefficient resource allocation among DEP's thinly stretched inspection staff.

Even if inspectors had information technology resources in the field, inspectors must still ensure they are completing the inspection report accurately and comprehensively. Because the electronic inspection report is tied to eFACTS, the public will not have an accurate understanding of DEP's oil and gas compliance activities if electronic inspection reports are not completed properly.

76 percent of inspection reports reviewed contained detailed comments that were not posted to the website.

For those 168 inspection reports that DEP could locate, we found that in 128 cases (76 percent), DEP inspectors' comments were not completely listed on the website. In fact, 53 of the 56 inspection reports we reviewed from the Meadville district office and 52 of the 58 reports from the Williamsport district office did not fully include inspectors' comments on the website. The Pittsburgh district office did a better job of including inspectors' comments on the website (31 out of 54 reports included comments on the website).

Inspectors' comments are critical as they provide a necessary description of the conditions present at the oil and gas facility during the inspection. Inspection comments also serve as a basis of ensuring consistency from district to district and in promoting transparency to the public.

[73] During our visits to the oil and gas regional offices, we were informed that inspectors have recently been supplied with cellular devices, which has improved communication. However, because most well sites are in remote locations, connectivity can be an issue.

Appendix C of this report provides selected examples of comments recorded on the hard copy inspection report, but that are not listed on DEP's website. While some of the comments written on the inspection report are technical in nature and may seem helpful only to DEP officials, we believe the public has a right to see this information. To that end, we did find instances in which an abbreviated note of the inspection report's comments was recorded on the website instead of the full notes.

DEP's online reporting does not meet statutory requirements.

Act 13 of 2012[74] mandates that DEP post certain specific data regarding inspections on its website. Specifically, the requirement is as follows:

> The Department shall post inspection reports on its publically accessible Internet website. The inspection reports shall include:
>
> (1) The nature and description of violations.
> (2) The operator's written response to the violation, if available.
> (3) The status of the violation.
> (4) The remedial steps taken by the operator or the department to address the violation.[75]

This mandate explicitly states that the department shall "post inspection reports" to its website. Therefore, we have interpreted this requirement to mean that the General Assembly intended that *all* information on the inspection reports, including the inspectors' comments, be posted to DEP's website. While this requirement did not become effective until April 16, 2012, after the majority of our audit period had elapsed, it should not take legislative action to serve as a prompt for DEP to post useful and informative inspection report information on its website.

[74] 58 Pa.C.S. § 3201 *et seq*. (Chapter 32 relating to Oil and Gas.)
[75] 58 Pa.C.S. § 3262.

As the state environmental regulator, DEP should post all information regarding inspections and violations on its website in an effort to be as transparent and accountable as possible to the public about oil and gas activities and their impacts on water quality.

DEP's online reporting lists inspections resulting in violations. Users can also query the data for unresolved violations through the online oil and gas compliance report. However, nowhere on DEP's website can a user find what the operator's written response is to the violation, nor the remedial steps taken to resolve it. This information is kept in the paper files maintained at each DEP district offices.

RECOMMENDATIONS

22. DEP should invest in upgrading the information technology resources available to its inspectors so that inspection reports can be completed electronically and then automatically uploaded to DEP's website.

23. Whether inspection reports are completed electronically in the first place or retyped based on paper inspection forms, DEP should ensure that inspectors complete the inspection reports accurately and comprehensively.

24. DEP should ensure that inspectors' comments related to the inspections are reported on its website so that the public has a complete understanding of conditions at the oil and gas facilities during the inspections.

25. DEP must comply with all online reporting mandates and ensure that it posts the operators' responses and remedial actions taken when violations are noted.

26. Until DEP moves to an all-electronic system for completing inspection reports, DEP should develop a file management system that will prevent original hard-copy inspection reports from being lost. These hard copies are the official record of inspections and their results, and DEP should securely maintain these reports.

Department of the Auditor General's Evaluation of DEP's Response

DEP disagreed with the finding, but agreed with Recommendations 22, 23, 25, and 26. DEP disagreed with Recommendation 24. DEP's response to the report appears in full beginning on page 118.

As we reported in the finding, DEP is not complying with the statutory provisions to post required information regarding an operator's written response to violation(s), as well as remedial steps taken to resolve it.

In its response, DEP boldly states the following (emphasis added):

> DEP has posted **all** statutorily required inspection information on eFACTS since 2012. Although information regarding operators' responses and remedial actions taken following a violation **is not currently available in a format that can be posted electronically**, that information is available in the hard-copy files in DEP's regional offices.

DEP contradicts itself in the above statement. It cannot conclude that it has posted all required information but then state that two pieces of required information are not posted because it is not available in an electronic format. The fact that the data does not exist electronically is merely because DEP has not made the effort to make it so. Simply put, because DEP has not made the information available electronically, and subsequently does not post it to its website (as required by law) DEP cannot claim that it is compliant with the law.

It is interesting to note that in its response to our finding, DEP made specific mention that it "…is committed to complying with any enhanced reporting requirements that may be enacted in the future." While this attitude is certainly commendable, DEP should commit to complying with the reporting requirements currently required by law, before it decrees its willingness to fulfill future reporting requirements.

DEP's rhetoric does little to resolve the failings we have identified in our finding.

With respect to the missing information from its files, DEP asserts that its Record Management System will improve upon its filing system limitations. DEP's poor recordkeeping during our audit period is a significant problem which cannot be dismissed as having been fixed today. As DEP states in its response, only the paper records in its regional offices serve as the official records of DEP's regulatory efforts. Yet, as we found, DEP could not locate 26 of the inspection reports we requested on the day of our visit, and ultimately 12 (or 7 percent of our selection) were never found.

Therefore, DEP does not have official documentation of these 12 inspections. It is important to note that we only tested a group of 180 inspections and found that seven percent of the records could not be located. The total number of lost official records could be much higher when you consider that DEP's electronic data indicates that more than 84,000 inspections were conducted during the audit period.

Consequently, we fully agree with DEP that "the fact that a few documents could not be located is problematic"; however, we disagree with the suggestion that "full implementation of DEP's Record Management System will eliminate a reoccurrence of this issue." In other words, DEP will not be able to recreate these missing "official records," nor can DEP rely on the collective memories of its staff, many of whom have left the department, for information on these inspections. As a result, DEP may never have the full history of inspections of shale gas wells.

Finding Eight → **Data collected in eFACTS did not provide DEP with adequate information needed to monitor a growing shale gas industry.**

Key points:

- Deficiencies in eFACTS data prevented DEP from answering important questions about shale gas wells.
- DEP's inconsistent data collection procedures inhibited its ability to use the data to aid DEP's mission of protecting the environment.
- eFACTS used outdated software for data entry into the database.

DEP used and relied on its enterprise-wide eFACTS database to record and monitor its oil and gas-related activity in an effort to help its regulatory programs communicate and share information.[76] DEP stated that eFACTS "promotes 'knowledge management' and networking to create a single database to share information between departmental programs, instead of each program having its own database." We found eFACTS to be missing key data elements specific to shale gas drilling and DEP to be lacking consistent data collection procedures, which could have assisted DEP's "knowledge management" with regard to having timely, accurate, and reliable data for the management of shale gas development.

Deficiencies in eFACTS data prevented DEP from providing accurate and reliable answers to important questions about shale gas wells.

During our analysis of eFACTS inspection, violation, and enforcement data, we found that eFACTS did not contain individual data fields specific to oil and gas drilling. While this may seem like an inconsequential data issue, the effects are significant to DEP's ability to use its data to conduct trend analysis about oil and gas activity.

For example, we found that important information about well inspections was found in the "inspection comments" field,

[76]eFACTS is known formally as the Environmental Facility Application Compliance Tracking System.

particularly in inspections that did not result in violations. The "inspection comments" field and the "violation comments" fields were "text" fields that enabled free form data entry and were not specific fields that would have captured details as separate pieces of information. As a result, we found the eFACTS "text" fields contained inconsistent data, and in many cases, inspectors failed to enter comments altogether (see Finding Seven). Entering inspection information inconsistently and incompletely into "text" fields made the ability to search on key inspection information difficult at best and hindered DEP's ability to use modern data analysis techniques (i.e., trend analysis).

In addition, we found that inspection data recorded in eFACTS lacked the specifics needed to analyze conditions that led to violations at well sites. For instance, rather than recording the observation of gas escaping or defective cement in separate data fields, the conditions leading to violations were recorded in the "inspection comments" field. However, the "inspection comments" field was populated only 30 percent of the time in inspection records with violations.

Another deficiency we noted was that wells with the same violation code had very different entries in the "inspection comments" field in eFACTS. For example, during our audit period, DEP cited 11 wells for failure to case and cement to prevent migration into fresh groundwater (violation code 207B). While all 11 wells were cited for the same violation, the inspection records in eFACTS included diverse entries in the "inspection comments" field.

Some inspection comments referenced incorrect casing and cement, while others included indications of active gas migration at the site such as, "…gas migrating to surface through cement…" or "…annulus had bubbles migrating out of joint…." Two of the eleven inspections with this violation code had no inspection comments, but included information in another field called "violation comments" indicating that the operator was notified of "leaks." Another two inspections with this same violation had neither "inspection comments" nor "violation comments" recorded in eFACTS.

If eFACTS had contained unique fields about specific problematic conditions at well sites, the data collected could have been more consistent and less difficult to analyze. Since eFACTS did not have a separate field indicating observation of gas migration at the well site, it was not possible to use eFACTS data to answer the question: "How often did an inspector observe active gas migration at a well site?" Therefore, we believe the data in eFACTS could not have been used by DEP as the optimal tool for monitoring shale gas drilling and its potential to impact groundwater.

In another matter, we learned at the audit exit conference that eFACTS did not contain fields to describe whether a particular oil and gas well was an active drilled well. While the spud date was captured in eFACTS, the date that active drilling began was recorded only in paper files maintained at the regional offices. To answer questions about whether particular wells were actually drilled, DEP had to research each well's hard-copy file. Therefore, DEP could not use its own eFACTS data to answer the question: "How many active wells were never inspected?" (See Finding Four) If DEP could not use eFACTS to determine which wells were active wells, how could DEP use eFACTS as a basis for scheduling inspections effectively?

DEP's inconsistent data collection procedures inhibited its ability to protect the environment and provide transparency to the public.

During our testing of inspection files maintained at the regional offices, we found that critical information was displaced across the state (see Finding Seven). Not all of the pertinent information about an inspection was recorded in eFACTS, especially when the "inspection comments" field was not populated. Some of the inspection information resided on paper reports, some in Excel spreadsheets, and some in the collective memories of the various inspectors—many of whom are no longer employed by DEP.

The lack of consistent electronic recordkeeping in eFACTS put inspectors, especially newly-hired inspectors, in the disadvantaged position of not having all relevant information

about a well in the central database. Further, since the primary means of providing transparency to the public was through the eFACTS website, maintaining vital inspection information in paper files at the regional offices made this information much less accessible—and transparent—to the public.

Without effective data collection procedures and corresponding structured data fields for tracking necessary information about oil and gas wells, DEP could not depend on eFACTS to function optimally for its management needs. Accurately and effectively collecting and utilizing data is a fundamental requirement to creating a functional relational database.

A strategy for collecting data often entails starting at the end and working backwards. DEP's oil and gas program did not focus its efforts on defining data collection requirements that could have demonstrated compliance with the law and protection of the environment. Without identifying clear business requirements for the specific data elements that must be captured, the oil and gas program could not provide clear direction to the information technology team for system design. eFACTS appeared to be developed from the standpoint of: "What do we have, and how can we make it work?," rather than: "What information do we need to ensure compliance with laws and regulations, follow up on problematic shale development, and provide the public with assurance of our monitoring?"

In order to meet the ongoing demands of shale gas development, DEP should define the business requirements of shale gas monitoring and increase the number of fields used in eFACTS that capture inspection details. The identification of these business requirements should not be made without foresight. To that end, DEP should initiate a new information technology strategic plan for its oil and gas program and begin identifying business requirements to support collecting more oil and gas information in eFACTS that will meet the needs of DEP, the regulated community, and most importantly, the public. (See Finding Six.)

eFACTS used outdated software for data entry into the database.

eFACTS is a contractor-maintained, enterprise-wide application which was designed in the 1990s, at a time when no one could have envisioned the subsequent shale gas development boom. eFACTS used Oracle Forms software for its input screens for entering permits, inspections, violations, enforcements, complaints, investigations, and other actions of any activity regulated by DEP.

In studying eFACTS' data collection documentation, we found that eFACTS' input screens were not user-friendly. More sophisticated input screens would have provided additional dropdown menus to prompt the user for faster and more consistent data entry, including required data elements. As discussed in Findings Three and Seven, the current input field design has likely contributed to the data errors we found with oil and gas complaint tracking and inspection reporting.

RECOMMENDATIONS

27. DEP should determine:

- what information must be captured to ensure compliance with federal and state statutes and regulations;
- what information must be captured to ensure operators follow best management practices;
- what information must be captured to ensure all current inspection and complaint information is available to inspectors in eFACTS when performing their duties;
- what data is being captured in external paper reports, spreadsheets, and other informal systems that is not currently captured in eFACTS; and
- what data is being captured in the text fields that should be captured in structured data elements to support modern data analysis techniques, i.e., trend analysis.

28. DEP should determine the best information technology solution to capture the information needed by DEP. DEP

should determine whether the current system can be modified or whether a new system should be developed. The system DEP chooses should enable inspectors and complaint handlers to eliminate separate side systems and manual working papers to track their activities. The system should be a user-friendly, structured relational database that provides DEP the tool to effectively collect necessary information for monitoring oil and gas drilling, specifically shale gas development. Also, the system should enable DEP to provide pertinent summary and detailed information of public interest (i.e., the number of wells, history of wells, complaint(s) submitted on wells, etc.).

29. DEP should develop policies, procedures, and provide the necessary training to ensure that all pertinent information about wells and drilling-related activities is captured in the database in a timely manner.

Department of the Auditor General's Evaluation of DEP's Response

DEP disagreed with the finding and disagreed with Recommendation 28. DEP agreed with Recommendations 27 and 29. DEP's response to the report appears in full beginning on page 118.

This finding addressed the numerous concerns we had about the underlying information technology resources available to support DEP's mission, and more specifically, the oil and gas program.

In its response, DEP merely defends the status quo and the fact that it has not been more proactive in ensuring that it has adequate information to support its regulatory efforts. DEP appears to be dismissive of change, stating, "…the cost to the Commonwealth to overhaul the entire system is prohibitive." While we agree that there will be added costs, the cost of inaction may ultimately be more costly to the commonwealth. Further, we disagree that the taxpayers of Pennsylvania should solely bear the additional costs. The shale gas industry itself should be responsible for DEP's costs to effectively regulate the industry.

We take exception with a number of DEP's other statements. In particular, its assertion that:

> While DEP's reliance on paper-based record system made gathering information cumbersome for the audit staff, the system is effectively utilized by trained DEP personnel throughout the Commonwealth.

As of December 2011, DEP argued against the release of records in a legal filing regarding the previously mentioned newspaper's request for records related to water supply impacts. According to the *Scranton-Times Tribune*, "In affidavits, the head or file review coordinator of each DEP regional office described the limits of the filing system and their efforts to navigate it to find responsive records."[77] DEP may claim that these affidavits applied to how the agency *was*, and that its new record management system will solve these issues. However, our observation at one DEP regional office where the record management system had already been implemented was that certain records could not be located. Consequently, we question just how effectively its system can be utilized by trained DEP personnel.

DEP also alleged that it warned us of the difficulty in attempting to retrieve electronic information with one "push of a button." And, that:

> Despite DEP's proviso, the auditors consistently declined offers to conduct a comprehensive inspection of all relevant hard-copy documents (such as well records) in order to obtain a complete understanding of the Oil and Gas Program. Instead, the auditors insisted on conducting their review based almost exclusively on electronic stored data.

This allegation is not supported by actual events. In fact, early in the audit process DEP attempted to block our access to its hard-copy documents, citing concerns about "confidentiality," "attorney-client privilege," and the "attorney work-product doctrine." We ultimately resolved this impasse. However, even after an agreement was reached, DEP made our efforts to visit district offices exceedingly difficult, oftentimes delaying our requests by weeks. Nonetheless, in the end, we visited all three DEP oil and gas district offices, with multiple visits to

[77] Laura Legere, "Open records case produced untracked drilling documents", *Scranton Times-Tribune*, May 19, 2013.

two of them. During the district office visits we met with DEP's field supervisors and reviewed DEP's hard-copy file documents for a select group of inspections and complaints.

DEP's arguments against using its electronic data for any type of analysis are, in our estimation, illogical. As we stated in the audit report's *Objective, Scope, and Methodology*, "Where possible, we attempted to validate eFACTS data with hard-copy documentation from DEP's files or from other outside sources. This task proved to be challenging because DEP's files vary widely from district to district, and, by DEP's own admission, certain information has been lost or misplaced." The notion that DEP's oil and gas program can only be measured through the systematic review of hundreds of thousands of paper-based records is nothing more than a "red herring" and demonstrates a weakness in DEP's management protocols. Data mining is an important and valid approach for reviewing any agency's performance.

DEP concluded its response by stating the following:

> Finally, it is important to note that the limitations of eFACTS have not negatively impacted the Oil and Gas Program's ability to effectively regulate unconventional gas well activities. This conclusion is supported by the fact that nowhere in the Auditor General's 72 page report is there a single example of DEP's failure to protect a negatively impacted private or public water supply.

As we stated in the audit report, "we caution that there may be additional findings that we were unable to verify because of the limitations and incompleteness of the data." Therefore, DEP and the reader should **not** assume that as a result of this audit, DEP's oil and gas program has a "seal of approval" from the Department of the Auditor General. In fact, we are quite critical of DEP's performance. As we highlighted throughout the report, and as further evidenced by DEP's comments to our audit report, the agency was—and continues to be—underfunded and understaffed to handle the boom created by shale gas development. Only DEP's commitment to change and full implementation of our recommendations will bring about the much needed improvements in DEP's oversight of the shale gas industry.

Appendix A

Objectives, Scope, and Methodology

The Department of the Auditor General conducted this performance audit in order to provide an independent assessment of the Department of Environmental Protection (DEP) and its monitoring activities related to ensuring water quality is not adversely impacted by shale gas development activities.

We conducted this audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Objectives

Our performance audit objectives were as follows:

1. Determine the adequacy and effectiveness of DEP's monitoring of water quality as potentially impacted by shale gas development activities, including but not limited to, systems and procedures for testing, screening, reporting, and response to adverse impact such as contamination.

2. Determine the adequacy and effectiveness of DEP's monitoring of the handling, treatment, and disposal of waste connected with shale gas development activity, including but not limited to, systems and procedures for testing, tracking, treating, disposal, data collection and analysis, reuse and recycling, reporting, and response to adverse impact such as contamination.

A note about our audit objectives.

The Environmental Protection Agency (EPA) is currently engaged in an extensive project to study the impacts of hydraulic fracturing on drinking water resources. This research, which is science-based and will be peer-reviewed, is looking at Pennsylvania's experiences with shale gas development. Because we did not want to duplicate ongoing scientific analysis, our audit is not an investigation of the

hydraulic fracturing process or its potential impact on water quality. Instead, our audit focused on how DEP monitors shale gas development activities and, in particular, how DEP inspects those facilities and responds to citizen complaints about potential impacts to water supplies.

Accordingly, we assessed whether DEP's monitoring of shale gas development activities that specifically related to DEP's inspection process, DEP's role in responding to complaints, and DEP's monitoring of waste generated from shale gas development activity were adequate and effective. We identified these areas as significant to the audit objectives since they are directly related to DEP's requirement to monitor shale gas development activities through the enforcement of environmental laws and DEP's mission statement "to protect Pennsylvania water from pollution." Any deficiencies in DEP's monitoring activities during the conduct of our audit, and determined to be significant within the context of the audit objectives, are included in this report.

Scope

This audit report presents information for the period January 1, 2009, through December 31, 2012, unless otherwise indicated.

DEP management is responsible for establishing and maintaining effective internal controls to provide reasonable assurance that DEP is in compliance with applicable laws, regulations, contracts, grant agreements, and administrative policies and procedures. In conducting our audit, we obtained an understanding of DEP's internal controls, including some information systems controls, as they relate to those requirements and that we considered to be significant within the context of our audit objectives. For those internal controls considered to be significant within the context of the audit objectives, we also assessed the effectiveness of the design and implementation of those controls, as described in the Methodology section that follows. Any deficiencies in internal control that were identified during the conduct of our audit and determined to be significant within the context of our audit objectives are included in this report.

DEP data limitations.

As discussed in Finding Eight, much of our initial analysis used data which was generated from DEP's Environmental Facility Application Compliance Tracking System (eFACTS). Where possible, we attempted to validate eFACTS data with hard-copy documentation from DEP's files or from other outside sources. This task proved to be challenging because DEP's files vary widely from district to district, and, by DEP's own admission, certain information has been lost or misplaced.

Government Auditing Standards, (sections 6.23-6.27) require that we consider information systems controls "… to obtain sufficient, appropriate evidence to support the audit findings and conclusions." This process also involves determining whether the data that supports the audit objectives is reliable. In addition, Publication GAO-09-680G, *Assessing the Reliability of Computer-Processed Data*[78], provides guidance for evaluating data using various tests of sufficiency and appropriateness when the data are integral to the audit objective(s).

Due to the use of outdated software for data entry and the incompleteness of the eFACTS data, coupled with the other procedural weaknesses noted in our findings and, most importantly, the error rates noted when tracing the data samples from eFACTS to source documents, we have deemed DEP's data to be not sufficiently reliable. However, that data was not the primary focus of this audit.

It is important to note that the statistics presented in our findings are based on the best information (data) available at the time of our audit procedures. While we do not believe that the data limitations we faced undermined the validity of any of our audit findings, conclusions, or recommendations, we caution that there may be additional conditions that existed that would have warranted additional findings that we were unable to verify because of the limitations and incompleteness of the eFACTS data.

[78] Government Accountability Office, July 2009, External Version I.

Methodology

To address our audit objectives, we performed the following procedures:

- Interviewed DEP officials, including the Deputy Secretary for Oil and Gas Management, the Deputy Secretary for Water Management, and DEP's Chief Counsel.

- Interviewed the Director of the Bureau of Laboratories to obtain an understanding of DEP's role in performing laboratory tests on DEP collected water samples.

- Interviewed staff from DEP's Bureau of Waste Management to obtain an understanding of the bureau's role in the management of wastes associated with shale gas development activities.

- Interviewed staff from DEP's Bureau of Information Technology, including DEP information technology contractors, to obtain an understanding of the databases and related data associated with oil and gas activities.

- Interviewed management officials from the Susquehanna River Basin Commission to obtain information on the Commission's relationship with DEP in regulating shale gas development activities.

- Interviewed environmental representatives, individuals from the petroleum industry, as well as other stakeholders to discuss issues relevant to our audit objectives.

- Reviewed the 2010 and 2013 reports from the State Review of Oil and Natural Gas Environmental Regulations, Inc. (STRONGER) that presented STRONGER's results from reviewing Pennsylvania's oil and gas regulatory program, as well as attended the follow-up public session regarding the STRONGER report released in 2013.

- Reviewed and analyzed DEP's "Internal Review of Inspection and Enforcement of Natural Gas Operations."

- Toured several Marcellus Shale extracting operations in northcentral Pennsylvania to observe shale gas development activities.

- Attended a presentation by DEP titled, "The Occurrence, Investigation, and Migration of Stray Gas Related to Shale Gas Exploration."

- Interviewed management officials from each of DEP's three oil and gas districts to obtain an understanding of DEP's inspection, complaint handling, and waste management processes.

- Obtained and analyzed pertinent sections of Act 13 of 2012 (the Oil and Gas Act) and related regulations (Chapter 78) to determine DEP's responsibilities related to shale gas development activities, including inspections, complaint handling, and waste management, as well as to determine the extent to which DEP complied with these legal mandates.

- Obtained and reviewed DEP's policies related to shale gas development activities, including inspections, enforcement actions, penalties, waste management, and complaint handling in order to assess the design, implementation, and effectiveness of the management controls significant within the context of our audit objectives. These policies included, but were not limited to, the following:

    - Civil Penalty Assessment in the Oil and Gas Management Program
    - Compliance Monitoring of Oil and Gas Wells and Related Facilities and Activities
    - Oil and Gas Wastewater Permitting Manual
    - Residual Waste Management
    - Standard Operating Procedures for Complaint Response Management; Field Operations – April 7, 2011

- Standards and Guidelines for Identifying, Tracking, and Resolving Violations; April 4, 2004

- Reviewed 168 inspection reports prepared by oil and gas inspectors from DEP's three district offices between January 1, 2009, and December 31, 2012, and compared those reports to the inspection information contained on DEP's eFACTS Oil and Gas Compliance Report as published on its website in order to evaluate DEP's inspection process, as well as the usefulness of the inspection information available to the public.

- Toured DEP's laboratory to obtain an understanding of the process used for testing water samples taken during an inspection.

- Interviewed technical representatives from the Carnegie Museum of Natural History on their experiences in compiling data on shale gas wells in Pennsylvania.

- Conducted extensive evaluation of the complaint data stored in DEP's complaint tracking system in an attempt to determine the completeness and accuracy of the information as well as the usefulness to DEP as a management tool.

- Selected 120 complaint files from DEP's Williamsport and Pittsburgh district offices and reviewed documentation in order to assess the effectiveness of DEP's complaint handling process, as well as the controls related to that process, between January 1, 2009, and December 31, 2012.

- Reviewed DEP's website to evaluate the extent to which DEP posts the oil and gas industry's self-reported waste data to the website as required by law, and met with DEP officials to determine the extent to which DEP used that data as a monitoring tool.

- Included technical experts from the Department of the Auditor General's Bureau of Information Technology Audits as part of the audit team for data analysis and information systems assessment pertinent to our audit objectives.

- To assess data integrity and reliability of: 1) DEP's eFACTS inspection files; 2) DEP's inspections, violations, and enforcements production data; and 3) DEP's eFACTS Complaint Tracking System (CTS) production data, the audit team conducted the following procedures:

  - Reviewed the data for accuracy and completeness by reviewing database schemata, verifying record counts, and performing a high-level review of data fields and contents for appropriateness.
  - Compared DEP's inspection production data to inspections data presented on DEP's eFACTS compliance reporting on its website.
  - Interviewed DEP officials with knowledge about the databases and data.
  - Reviewed the Structured Query Language (SQL) or database queries used by DEP to extract the data.
  - Performed detailed sequence tests of complaint identification numbers to analyze whether we received all complaints in CTS during the audit period.
  - Traced a sample of data to source documents and vice-versa, where available.

Appendix B State and federal statutes and regulations related to oil and gas activities[79]

STATE STATUTES

Statute Name/Citation	Activity/Description
Former Oil and Gas Act, the act of December 19, 1984, Act 13 of 2012 Repealed and Placed this statute into the Pennsylvania Consolidated Statutes (P.L. 1140, No. 223, as amended, 58 P.S. § 601.101 *et seq.*)	**Oil and Gas Exploration and Production** This statute had set forth the permitting, financial responsibility, drilling, casing, operating, reporting, plugging and site restoration requirements for oil and gas wells.
Chapter on "Oil and Gas," the act of February 14, 2012, effective April 16, 2012[80] (P.L. 87, No. 13, 58 Pa.C.S. § 3201 *et seq.*)	**Oil and Gas Exploration and Production** This chapter of the statute is a continuation, with certain exceptions, of the former Oil and Gas Act discussed above.
Oil and Gas Conservation Law, the act of July 25, 1961 (P.L. 825, No. 359, as amended, 58 P.S. § 401 *et seq.*)	**Well Spacing** This law establishes the Oil and Gas Conservation Commission, to govern well spacing and drilling units.
Coal and the Gas Resource Coordination Act, the act of December 18, 1984 (P.L. 1069, No. 214, as amended, 58 P.S. § 501 *et seq.*)	**Permitting** This law governs the coordination of drilling permits with respect to workable coal seams, and plugging requirements.

[79] This list is not intended to be a comprehensive list of all laws and regulations related to oil and gas activities. A comprehensive list can be found in the *Governor's Marcellus Shale Advisory Commission Report* (Report), dated July 22, 2011. The information we present here is derived from that Report, with updates and clarifications where necessary.

[80] In December 2013, the Pennsylvania Supreme Court held as unconstitutional certain provisions of Act 13 which would have limited local government's ability to zone shale gas development and enjoined their application or enforcement in *Robinson Township et al. v. Commonwealth of Pennsylvania et al.*, 83 A.3d 901 (Pa. 2013). *See also* 58 Pa.C.S. § 3215(b), (c), (d), and (e). In February 2014, the Supreme Court denied the Commonwealth's request for reconsideration and remanded the case to the Commonwealth Court for "further factual development and ultimate determination" as to whether other parts of the Act may also be enjoined or stricken. On July 17, 2014, the Commonwealth Court, while upholding some of the challenged provisions of Act 13, including that the Commonwealth had valid reasons for requiring that public water suppliers, but not private water well owners, be notified of drilling-related spills, ruled as unconstitutional those Act 13 provisions that had provided the Public Utility Commission with the authority to review the validity of municipal ordinances regulating oil and gas development.

Department of Environmental Protection

Statute Name/Citation	Activity/Description
The Clean Streams Law, the act of June 22, 1937 (P.L. 1987, No. 394, as amended, 35 P.S. § 691.1 *et seq.*)	**Permitting** This statute provides DEP with the basic legal authority to prevent and abate water pollution in Pennsylvania and to reclaim and restore all waters of the Commonwealth. This statute also establishes basic permit requirements for certain activities. DEP issues many different permits under this law, including permits under the National Pollutant Discharge and Elimination System (NPDES) pursuant to Chapter 92a.
Dam Safety and Encroachments Act, the act of November 26, 1978 (P.L. 1375, No. 325, as amended, 32 P.S. § 693.1 *et seq.*)	**Water Obstructions and Encroachments** This statute provides DEP with the authority to regulate construction, operation, maintenance and removal of water obstructions and encroachments. DEP issues various permits under this statute, including those for stream crossings under Chapter 105.
Solid Waste Management Act, the act of July 7, 1980 (P.L. 380, No. 97, as amended, 35 P.S. § 6018.101 *et seq.*)	**Solid Waste** This law establishes requirements for regulation of solid waste storage, collection, transportation, processing, treatment, and disposal. DEP issues various permits pursuant to this statute, including those for beneficial use of residual wastes.
Air Pollution Control Act, the act of Jan. 8, 1960 (P.L. 2119, No. 787, as amended, 35 P.S. § 4001 *et seq.*)	**Air Quality** The primary law that governs all air quality issues in Pennsylvania, including the permitting, monitoring, and enforcement of all air contamination sources.
Storage Tank and Spill Prevention Act, the act of July 6, 1989 (P.L. 169, No. 32, as amended, 35 P.S. § 6021.101 *et seq.*)	**Storage Tanks** This statute governs use of storage tanks and cleanup of spills.
Water Resources Planning Act, the act of December 16, 2002 (P.L. 1776, No. 220, 27 Pa.C.S. § 3101 *et seq.*)	**Water Withdrawals** This law requires the development of a State Water Plan, establishment of statewide Water Resource Committee, and registration, record keeping and periodic reporting of certain water withdrawals and withdrawal uses. It also provides for designation of critical water planning areas.
Environmental Laboratory Accreditation Act, the act of June 29, 2002 (P.L.556, No. 90, as amended, 27 P.S. § 4101 *et seq.*)	**Laboratory Accreditation** This statute authorizes DEP to issue regulations establishing accreditation program for environmental laboratories.

Statute Name/Citation	Activity/Description
Delaware River Basin Compact, the act of July 7, 1961 (P.L. 518, No. 268, as amended, 32 P.S. § 815.101 *et seq.*)	**Compact** This statute codifies the Compact entered into by Pennsylvania with the states of Delaware, New Jersey, and New York and the United States.
Susquehanna River Basin Compact, the act of July 17, 1968 (P.L. 368, No. 181, as amended, 32 P.S. § 820.1 *et seq.*)	**Compact** This statute codifies the Compact entered into by Pennsylvania with the states of Maryland, New York, and the United States.
Great Lakes – St. Lawrence River Basin Water Resources Compact, the act of July 4, 2008 (P.L. 526, No. 43, 32 P.S. § 817.21 *et seq.*)	**Compact** This statute memorializes a compact "with any one or more of the states of the United States" prohibits any diversions of the Great Lakes Basin with limited exceptions and provides DEP with regulatory authority over withdrawals that equal or exceed 100,000 gallons per day and joint authority over consumptive uses exceeding 5 million gallons per day.
Hazardous Sites Cleanup Act, the act of October 18, 1988 (P.L. 756, No. 108, as amended, 35 P.S. § 6020.101 *et seq.*)	**Emergency Response** This statute governs hazardous sites cleanup.
PA Safe Drinking Water Act, the act of May 1, 1984 (P.L. 206, No. 43, as amended, 35 P.S. § 721.1 *et seq.*)	**Water Supplies** This statute governs public water supplies.
The Waste Transportation Safety Act, the act of June 29, 2002 (P.L. 596, No. 90, as amended, 27 Pa.C.S. § 6201 *et seq.*)	**Waste** This statute establishes a waste transportation safety program for the transport of municipal and residual waste, including requirements for authorization from DEP.

FEDERAL STATUTES

Statute Name/Citation	Activity/Description
The Federal Water Pollution Control Act (33 U.S.C. § 1251 *et seq.*)	**Water Quality** This statute establishes minimum federal standards for protection and restoration of water quality, and the National Pollutant Discharge Elimination System for point source discharges.
The Clean Air Act (42 U.S.C. § 7401 *et seq.*)	**Air Quality** This statute establishes minimum federal standards for protection and restoration of air quality.

Department of Environmental Protection

Statute Name/Citation	Activity/Description
The Safe Drinking Water Act (42 U.S.C. § 300f – 300j-9)	**Drinking Water** This statute establishes minimum federal standards for drinking water supplies, including underground injection.
Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6901 *et seq.*)	**Waste** This statute establishes minimum federal standards for transport, handling, storage and disposal of solid waste.
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. § 9601 *et seq.*)	**Waste** This statute establishes a national cleanup program for hazardous substances and liability for landowners to avert future injury by remediation of contamination.
National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 – 4370b)	**Multiple** This statute requires federal agencies to evaluate the environmental impact of federal actions significantly affecting the quality of the human environment.
Wild and Scenic Rivers Act of 1989 (16 U.S.C. § 1271 – 1287)	**Water Quality** This statute protects wild and scenic rivers.

STATE REGULATIONS[81]

Regulation/Citation	Activity/Description
25 Pa. Code, Chapter 78	**Oil and Gas Wells** Chapter 78 had implemented, *inter alia*, the former Oil and Gas Act and the Chapter on "Oil and Gas" (Act 13 of 2012), which Repealed and Placed the Oil and Gas Act into the Pennsylvania Consolidated Statutes as a continuation of its provisions, with certain exceptions; contains basic requirements for natural gas well drilling, including operating standards for drilling, casing, cement, testing, monitoring and plugging of oil and gas wells to minimize gas migration and protect water supplies.

[81] Any and all of the references to the state regulations in this summary are intended to be to the current provisions.

Department of Environmental Protection

Regulation/Citation	Activity/Description
25 Pa. Code, Chapter 79	**Oil and Gas Conservation** Chapter 79 implements, inter alia, the Oil and Gas Conservation Law, the former Oil and Gas Act and Chapter on "Oil and Gas" (Act 13 of 2012), which Repealed and Placed the Oil and Gas Act into the Pennsylvania Consolidated Statutes as a continuation of its provisions, with certain exceptions, and the Gas Resource Coordination Act; addresses well spacing.
25 Pa. Code, Chapter 102	**Erosion and Sediment Control** Chapter 102 requires persons proposing earth disturbance activities to develop and maintain best management practices to minimize the potential for accelerated erosion and sedimentation and the manage post construction stormwater.
25 Pa. Code, Chapter 105	**Dam Safety and Waterway Management** Chapter 105 implements, *inter alia*, the Dam Safety and Encroachments Act, and the Flood Plain Management Act; provides for the comprehensive regulation and supervision of dams, reservoirs, water obstructions, and encroachments.
25 Pa. Code, Chapter 93	**Water Quality Standards** Chapter 93 defines specific water quality criteria and designated water uses to be protected and maintained for all surface waters in Pennsylvania; contains the water quality antidegradation program for protecting and maintaining existing water quality for exceptional value and high quality waters and existing uses of all surface waters.
25 Pa. Code, Chapter 95	**Wastewater Treatment Requirements** Chapter 95 sets forth minimum treatment requirements for new and expanding mass loadings of Total Dissolved Solids, all industrial wastes and oil bearing wastes and discharges affected by Acid Mine Drainage.
25 Pa. Code, Chapter 96	**Water Quality Standards Implementation** Chapter 96 establishes processes for achieving and maintaining water quality standards; addresses total maximum daily loads for surface waters.

Department of Environmental Protection

Regulation/Citation	Activity/Description
25 Pa. Code, Chapter 91	**Water** Chapter 91 sets forth several general provisions for administration and enforcement of Pennsylvania's water pollution control requirements; establishes specific application requirements, fee schedules, and conditions for the approval and permitting of the construction and operation of waste treatment facilities in Pennsylvania; sets forth requirements for reporting of releases that may cause pollution.
25 Pa. Code, Chapter 110	**Water Resources Planning** Chapter 110 implements, *inter alia*, the Water Resources Planning Act; establishes the requirements for registration of water sources, and record keeping and reporting of water withdrawal and use information.
25 Pa. Code, Chapters 121 – 129 and 131 – 145	**Air** This regulation implements, *inter alia*, the Air Pollution Control Act; contains national standards of performance for new stationary sources, standards for contaminants, national emission standards for hazardous air pollutants, motor vehicle and fuels programs, construction, modification, reactivation and operation of resources, alternative emission reduction limitations, standards for sources, ambient air quality standards, local air pollution agencies, reporting of sources, air pollution episodes, sampling and testing, variances and alternate standards, disbursements from the clean air fund and interstate pollution transport reduction.
25 Pa. Code, Chapters 287 – 299	**Waste** This regulation implements, *inter alia*, the Solid Waste Management Act; contains general provisions, residual waste landfills, residual waste disposal impoundments, beneficial use of coal ash, land application of residual waste, transfer facilities for residual waste, incinerators and other processing facilities, management of waste oil and storage and transportation of residual waste.

Department of Environmental Protection

Regulation/Citation	Activity/Description
25 Pa. Code, Chapters 260a – 270a	**Waste** This regulation implements, *inter alia,* the Solid Waste Management Act; contains hazardous waste management system: general, identification and listing of hazardous waste, standards applicable to generators and transporters of hazardous waste, owners and operators of hazardous waste treatment, storage and disposal facilities, interim status standards for owners and operators of hazardous waste treatment, storage and disposal facilities, management of specific hazardous wastes and specific types of hazardous waste management facilities, universal waste management, land disposal restrictions and hazardous waste permit program.
25 Pa. Code, Chapters 806 – 808	**Compact** Implements, *inter alia,* the Delaware River Basin Compact; contains review and approval of projects, water withdrawal registrations and hearings and enforcement actions.
25 Pa. Code, Chapter 901	**Compact** This regulation implements, *inter alia,* the Susquehanna River Basin Compact; contains, rules of practice and procedure, comprehensive plan and water quality, water supply charges, flood plains and groundwater protection area, Southeastern Pennsylvania.
25 Pa. Code, Chapter 245	**Storage Tanks** Implements, *inter alia,* the Storage Tank and Spill Prevention Act; contains general provisions, certification program for installers and inspectors of storage tanks and storage tank facilities, permitting of underground and aboveground storage tank systems and facilities, corrective action process for owners and operators of storage tanks and storage tank facilities and other responsible parties, technical standards for underground storage tanks and aboveground storage tanks and facilities, simplified program for small aboveground storage tanks and financial responsibility requirements for owners and operators of underground storage tanks and storage tank facilities.

FEDERAL REGULATIONS

Regulation/Citation	Activity/Description
40 C.F.R. §§ 50.1-87.60	**Air Quality** This regulation implements the Clean Air Act.
40 C.F.R. §§ 141.1-147.3400	**Drinking Water Quality** This regulation implements the Safe Drinking Water Act.
40 C.F.R. §§ 240.100-Pt 280, App. III	**Waste** This regulation implements the Resource Conservation and Recovery Act (RCRA).
40 C.F.R. § 300.1 *et. seq.*	**Waste** This regulation implements the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).
18 C.F.R. § 380.1 *et. seq.*	**NEPA** This regulation implements the National Environmental Policy Act (NEPA).
18 C.F.R. § 401.1 *et. seq.* and § 410.1 *et. seq.*	**Compact** Implements the Delaware River Basin Compact.
18 C.F.R. Part § 801.1 *et. seq.*; § 806.1 *et. seq.*; § 808.1 *et. seq.*	**Compact** Implements the Susquehanna River Basin Compact.

Appendix C

Selected examples of missing inspectors' comments that are not included on DEP's website, but that are available in DEP's public files.

All of this information is helpful in knowing drilling status and in knowing about potential concerns the inspector had during the inspection.

The inspector noted violations in the comments – but the inspector later commented that there were "no violations."

What the inspector actually noted in the inspection comments section of the inspection report*:	And what appears on DEP's website:
Example #1: Violations associated with this inspection have been attached to the XXXX well, permit number XXXXXX. On site with XXXX, DEP WQS and XXXX, DEP WQS, to conduct an inspection of the pit. Met with XXX and XXX of XXX. The pit contents have been removed. XXXX was in the process of preparing for the weekend precipitation event. Evidence of dark staining was observed on the well pad outside the perimeter of the pit and in relatively close proximity to where the drilling rig was formerly housed. Tears in the liner were observed on the well pad behind two (2) mud holding tanks. Black fluid was observed on the liner in this area, however the containment was breached and this fluid was impacting the surface of the ground. Dark staining on the well pad was also observed to be impacting the surface of the ground between the mud holding tanks. Please contact the Department to schedule a follow up inspection. Please feel free to contact me with any questions.	--
Example #2: I arrived on-site @ 08:40 hrs. Coil tubing rig on location, not currently running. I met XXXX company man on the site. He informed me that the coil tubing rig was broken down. I looked at XXX's PPC and Control and Disposal Plan, and Pressure Barrier Policy is present in the plan. 25 PA Code 78.55 (b) requires the Pressure Barrier Policy to be part of the Control and Disposal Plan, and for the plan to be available on the site during drilling and completion activities. I recommend that XXX develop this policy ASAP in order to avoid future violations. I walked the site with XXX; I identified several small puddles on the pad with elevated conductivity (1600 ps/cm to 5ms/cm). The ditch surrounding the site did not display elevated conductivity, although an area off of the southeast corner of the pad had 2 puddles showing elevated conductivity (1900ps/cm and 2.0 ms/cm); other puddles farther down-gradient showed normal conductivity (600 ps/cm to 800ps/cm). A vac truck was present on the pad, and XXXX instructed the operator to vac the locations I had indicated, and he was doing so when I departed @ 09:25 hrs.	--
Example #3: On X/X/XXXX at 1200 hrs., a routine complete inspection was conducted at the XXXXX well site. During the inspection a crew was installing silt sock around the perimeter of the pad. The weekly inspection reports and E&S plan were on the site. I did not see a site sign, or drilling permits on the site. I recommend both are installed at the site. The disturbed areas beside the access road were not yet stabilized. I recommend these areas be stabilized. The access road had additional waterbars in the road, which I believe are beneficial. The pad has been timbered and stumped. The silt socks were being installed during the inspection. I left the site at 1300 hrs. There were no violations.	--

What the inspector actually noted in the inspection comments section of the inspection report*:	And what appears on DEP's website:
Example #4: XXXXX and I were on site at 1145 and again at 1415 (XXXX of XXXX explained that XXXX representatives would be at the site after 1300) in response to a self report from XXXX concerning a previous release. It was discovered that a previously self reported release of hydraulic fluid to containment had escaped the containment and impacted the well pad. The initial report was made by XXXXXX. XXXX initial report had explained that on XX/XX/XX at 0600 hours, a release of 1-2bbl of hydraulic fluid were released to containment from a line on the drill rig. At the time of the inspection, associates of XXXX were on site scraping the pad and leveling it off. Two stone stockpiles were on site. XXXX and I met with XXXX of XXXX who showed us the area on the pad that had been impacted. XXXX explained that they excavated the material from around the well cellar and put it in a roll to mix with lime to solidify the material prior to it being hauled off site for disposal. XXXXX stated that he believed XXXXXX representatives would be at the well pad after 1300 hours. An XXXX vacuum truck, (license plate #XXXXX) operated by XXX, labeled "brine" was mobilized to the site for recovery of the free product and water within the excavation. XXXX had taken a few field readings, of ponded fluid on the well pad, with the Extech Extik II. The water within the excavation around the well cellar had conductivity of 1978ps, 1341 TDS, 860ppm salinity. An area along the backside of the well pad had an average conductivity of 2.15ms with a spike at 2.4ms. During this time it was noted that the area along the wetland and around the perimeter ditch appears to have a coating of white dust. During the second inspection noted below, XXXX explained that this was lime from their solidification process. XXXX took a few conductivity readings along the perimeter ditch in this area which ranged from 1000ps-1100ps. At 1415, the Department arrived back at the well site and met XXXX of XXXX, XXXXX, and XXXXX. XXXX was able to review the incident report on his cellular phone and explained that a hydraulic line burst on the rig floor. At this time it shut down the top drive and all hydraulics on the rig. It was noted that the hydraulic fluid was released to containment however some traveled to the well cellar where it was pumped from. The report stated that 320 gallons, of hydraulic fluid, were released however, the recovery volume is unknown being that they were vacuuming the fluid during a rain event. XXXX explained that the area around the well cellar had been excavated to remove drill mud. Each of the well cellars on this location appeared to have drilling residuals within them at the time of the inspection. XXXX stated that the well cellars had been recently cleaned. During this site meeting, the Department requested that XXXX do the following: 1. Clean the well cellars and remove any drilling residuals 2. Continue with the removal of fluid in the excavation 3. Investigate the white dust coating noted above and remove 4. Excavate impacted soils, delineate the extent of the contamination on site, collect confirmatory samples 5. Investigate the ponded water with elevated conductivity on the back side of the pad and report back to DEP with your findings Violations associated with this inspection have been attached to the XXXX Well (Permit #XXXX, Inspection ID XXXX)	--

How would the public know to go to another inspection report to read about these violations, when this information is absent from the online version?

These comments note concerns the inspector had during the inspection.

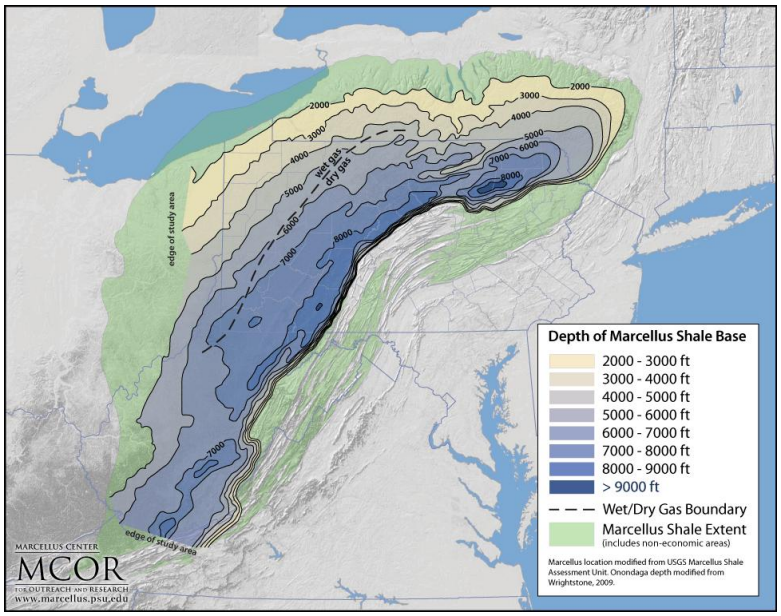
What the inspector actually noted in the inspection comments section of the inspection report*:	And what appears on DEP's website:
Example #5: Inspected location. Met on site with Company Rep XXXX Just finished stage 7 on XXXX well, and are running perforating guns XXXX well for stage 6. XXX on location conducting Completion operations and XXXX on location conducting wireline perforation operations. All completions equipment has containment, but multiple holes in containment. Reserve pit is open, and flow back line is discharging into the pit, I recommend that something be changed on the end of the flow line to prevent fluid from being discharged directly across the pit and onto the ground. Water in the pit is being reused and pumped down hole.	--
*The Department of the Auditor General does not name auditee employees or specific oil and gas operators. Instead, "XXXXX" appears on this chart to show that we have redacted certain identifying employee name or operator information that was listed on the inspection report. We present this information only as an example of information that should be readily available to the public. We did not audit the inspection comments for accuracy to actual conditions or events.	

Source: Developed by Department of the Auditor General staff from review of 168 inspection reports and corresponding information on DEP's oil and gas compliance monitoring report.

Appendix D

Additional background information about shale gas development.

Marcellus Shale – What is it and where is it?



The Marcellus shale formation is a black shale that covers much of Pennsylvania and portions of West Virginia, New York, Maryland, Virginia, Kentucky, and Ohio. Nearly 400 million years ago, unusually large volumes of organic matter were trapped in layers of black shale. After millions of years of heat and pressure, the organic matter transformed into the natural gas that gas exploration companies search for today.

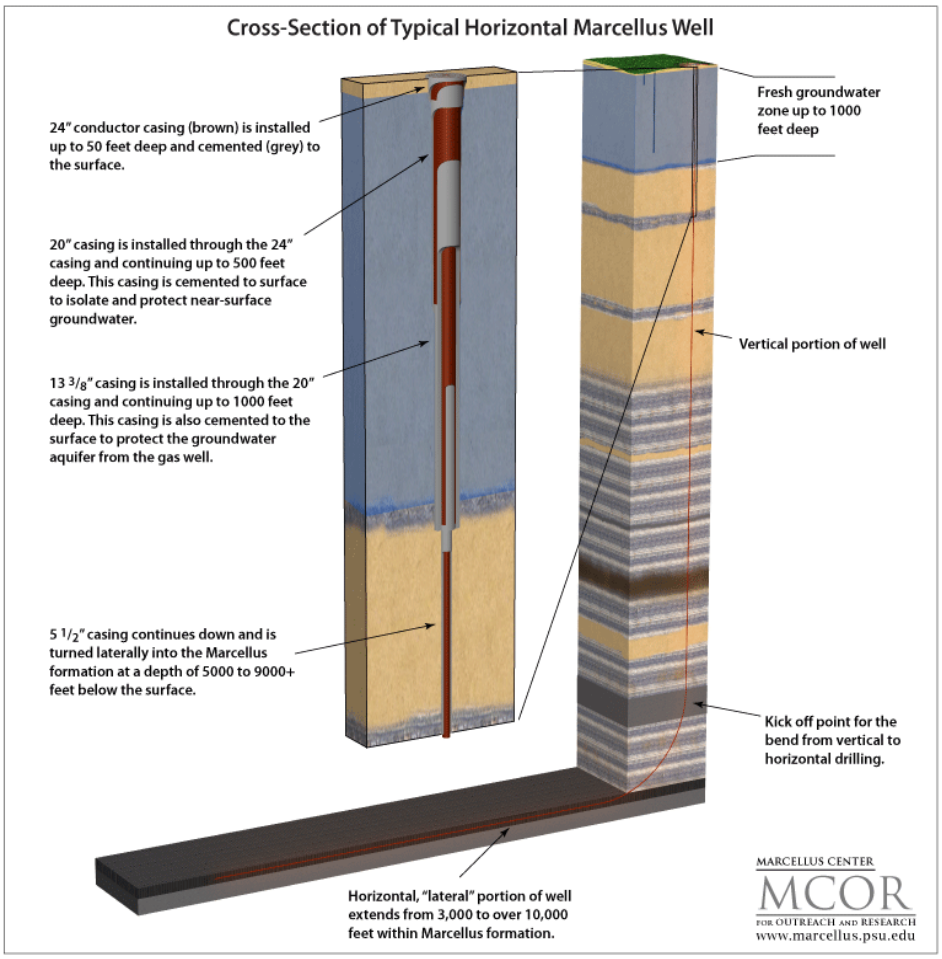
Within Pennsylvania, the Marcellus shale covers an area from the northeastern tier counties to the southwestern portion of Pennsylvania. Current development activity includes "dry gas" production in the northeastern counties (e.g., Bradford, Susquehanna, Tioga) and "wet gas" production in the southwestern counties (e.g., Washington, Greene, Butler).

Pennsylvania experienced its Marcellus shale boom only within the last five to six years. Recently, production activities have expanded in the southwestern areas of the state because of the increased value of wet gas.

How is a shale gas well drilled?

Natural gas reserves trapped within shale are referred to as "unconventional" since unconventional methods are used to

collect the gas. These unconventional methods involve horizontal drilling.



When drilling an unconventional well, operators begin by drilling a vertical wellbore from 5,000 to 9,000 feet into the shale rock. As the vertical wellbore is drilled, various diameters of steel pipe called "casing" are cemented into place in the wellbore. This casing protects groundwater aquifers from pollutants inside the well and helps to stabilize the wellbore as the operator drills farther into the subsurface. The casing also keeps surface water and other geological strata from mixing with and contaminating groundwater.

After the vertical wellbore is in place, operators begin to drill horizontally by using hydraulic powered drill heads. These hydraulic drills are steerable and bore into the shale following natural fractures that exist in the shale. Horizontal wellbores may extend 10,000 feet or more giving operators much more access to the shale.

How is a shale gas well fracked?

In order to release the natural gas for collection back at the surface, hydraulic fracturing, or "fracking," must be done. Fracking has become a generic term used to represent all facets

of the shale gas industry including the development of the site pad, truck traffic, water usage, waste treatment and disposal, and pipeline construction. In actuality, fracking is a specific term used by the industry to refer to a unique stage in shale gas extraction.

Hydraulic fracturing is often the most controversial aspect of the shale gas industry as it involves the use of large volumes of water and sand combined with a mixture of chemicals to stimulate the well into production.

Example of hydraulic fracking fluid ingredients used in one shale gas well

Ingredient	Volume
Water	4,000,000 gallons
Sand	1,500,000 pounds
Friction Reducers	2,040 gallons
Hydrochloric acid	1,336 gallons
Scale Inhibitors	2,040 gallons
Antimicrobial Agents	2,040 gallons

Source: Pennsylvania State University Extension, College of Agricultural Sciences, "Introduction to Hydrofracturing," March 17, 2011.

After the horizontal well has been drilled and cased, the operator injects various materials under extremely high pressure into the well. An individual shale gas well is typically fracked between 10 and 16 times to create the necessary fissures in the shale.

The exact proportion and volume of frack fluids injected into the well varies from well to well based on the shale's thickness, compressability, and rigidity. Generally, the frack fluids are 99.5 percent water and sand. The remaining 0.5 percent of the frack fluid contains chemical additives, which are necessary to stimulate the well into production, kill various microbes in the well, dissolve cement, add viscosity to the frack fluid, and add surfactants to make the water slippery.

What happens to the frack fluids?

A portion of the frack fluid injected into the well remains underground. Some frack fluid also comes back to the surface and is referred to as "flowback." The exact percentage of flowback returned to the surface varies from well to well; however, generally 8 to 10 percent of the frack fluids are

How poor is the quality of flowback and produced water?

Flowback and produced waters are very high in total dissolved solids (TDS). TDS are the compounds in the water that cannot be removed by a traditional water filter. TDS are made up of salts or compounds which dissociate in water to form ions. The EPA sets limits for TDS in drinking water at 500 parts per million (ppm). TDS in flowback and produced water can exceed 70,000 ppm; by comparison, sea water contains 35,000 ppm.

Source: EPA

returned to the surface within the first 30 days.[82] These fluids are captured on the surface and stored in storage tanks or in specially lined impoundments.

A shale gas well also returns over time "produced water," which is a combination of water and contaminants that occurs naturally in the formation. Both produced waters and flowback are poor quality and cannot be used or released without some sort of treatment.

According to research conducted by the United States Government Accountability Office, produced water contains a number of contaminants including, but not limited to, the following:

- salts, which include chlorides, bromides, and sulfides of calcium, magnesium, and sodium
- metals, which include barium, manganese, iron, and strontium
- oil, grease, and dissolved organics, which include benzene and tolune
- naturally occurring radioactive materials (NORM)
- production chemicals contained within the flowback.[83]

Exposure to the above contaminants at high levels may pose risks to human health and the environment. Therefore, operators must properly store, treat, and manage produced water. Most operators in Pennsylvania treat produced water on-site or collect it in impoundments or storage tanks to be later trucked off-site to a treatment facility or to be injected into deep underground injection sites. However, within Pennsylvania, it is becoming increasingly common for well operators to reuse and recycle produced water for other fracking jobs.

[82] Based on data collected by the Susquehanna River Basin Commission (SRBC). The SRBC is an interstate compact that controls water withdrawals from the Susquehanna River Basin. No operator may withdrawal water from the Susquehanna river basin without first obtaining Commission approval.
[83] United States Government Accountability Office, *Information on the Quantity, Quality, and Management of Water Produced during Oil and Gas Production*, p.12, January 2012.

Appendix E

DEP inspection schedule as outlined in Oil and Gas regulations.

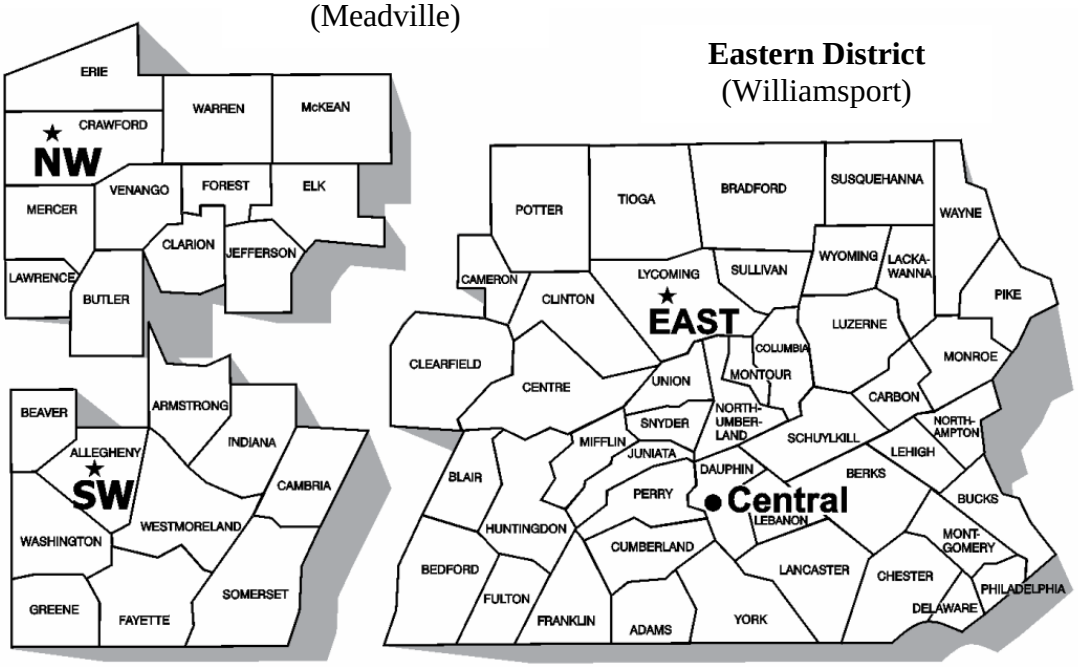
(1)	At least once prior to the issuance of a permit, if a waiver or exception is requested by the permit applicant.
(2)	At least once in verifying or resolving objections or determining the Department's response to objections, when objections are raised to a permit application.
(3)	At least once during each of the phases of siting, drilling, casing, cementing, completing, altering and stimulating a well.
(4)	At least once during, or within 3 months after, the time period in which the owner or operator is required to restore the site, after drilling the well.
(5)	At least once prior to the authorization to use an alternate method for plugging, casing or equipping the well.
(6)	At least once during the periods that an alternative method for plugging, casing or equipping the well is being used or installed.
(7)	At least once when a well is being reconditioned or repaired or when casing is being replaced.
(8)	At least once prior to a well being granted inactive status.
(9)	At least once during the plugging of the well.
(10)	At least once during, or within 3 months after, the period in which the owner or operator is required to restore the site, after the well is plugged or abandoned.
(11)	At least once before the bond or other financial security is released.
(12)	At least once a year, if there is onsite brine disposal or residual waste disposal subject to the statutes referenced in §78.902 (relating to policy).
(13)	At least twice a year if the well is located in a gas storage reservoir or in a gas storage reservoir protective area.
(14)	At least once a year to determine whether compliance with the statutes administered by the Department has been achieved.
(15)	If there is a violation, at least once to determine whether the violation has been corrected, or whether there is a continuing violation.
(16)	At least once, in response to a complaint.

Source: Developed by Department of the Auditor General staff from 25 Pa. Code § 78.903.

Appendix F DEP Oil and Gas District Offices

Northwest District
(Meadville)

Eastern District
(Williamsport)



Southwest District
(Pittsburgh)

Response from Department of Environmental Protection

The Department of Environmental Protection's (DEP) full response to this audit report is reproduced on the following pages. A statement of DEP's agreement/disagreement to our findings and recommendations, and our evaluation of DEP's response, can be found after the recommendations section of each finding contained in this audit report.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

June 27, 2014

The Honorable Eugene A. DePasquale
Department of the Auditor General
229 Finance Building
Harrisburg, PA 17120-0018

Re: Special Audit of the Pennsylvania Department of Environmental Protection's Performance in Monitoring Potential Impact to Water Quality from Shale Gas Development, 2009-2012

Dear Auditor General DePasquale:

The Department of Environmental Protection (DEP) is in receipt of the Special Audit of DEP's Performance in Monitoring Potential Impact to Water Quality from Shale Gas Development. The Department respects the role the Auditor General's office plays in ensuring state government works efficiently and in the best interests of all Pennsylvanians. It has been a pleasure working with your staff since the entrance conference on March 19, 2013 through our final exit interview on May 23, 2014.

The audit report encompasses the period of January 1, 2009 through December 31, 2012 and focuses largely on DEP's management of electronic data with respect to water supply complaint investigations. To a great extent, the audit report reflects how the Oil and Gas Program formerly operated, not how the program currently functions. Throughout the audit period until the present, DEP's Oil and Gas Program has made great strides improving the effectiveness of its regulatory efforts and its transparency to the public. Additionally, Act 13 of 2012, the first significant amendment to Pennsylvania's oil and gas laws in over 30 years, was enacted towards the end of the audit period. Act 13 introduced comprehensive changes to DEP's regulatory authority over the unconventional ("shale") gas industry. Consequently, many of the recommendations in the audit report have already been implemented by DEP since the Corbett administration took office in 2011 or are currently being considered for implementation.

DEP's response to an Auditor General's special performance audit report is governed by Management Directive 325.10 Amended. ("Review of Auditor General, Treasury, Legislative Budget and Finance Committee, and Other Audit Reports"). According to MD 325.10 Amended, an evaluation of the merits of the contents of this report and, therefore, the nature of any response thereto, is to be conducted by this agency applying the following minimum criteria:

1. Findings, conclusions, and recommendations are:

    a. Based on complete, accurate, and factual data;
    b. Formulated from facts that are directly applicable to individual situations;
    c. Not based on isolated facts that may not be representative of the whole;
    d. Indicative of objective, fair, and independent reporting;
    e. Cost effective in relation to benefits received;

f. In conformance with all laws, regulations, and other compliance factors;
g. Taking into consideration Commonwealth or agency policies, goals, or objectives;
h. Directly relevant to current conditions; and
i. Not outdated or inapplicable as a result of the passage of time between the conduct of an audit and the issuance of the audit report.

2. Corrective action for a particular condition has not already been taken before the issuance of the report.

3. Disclosure is made of strengthening, correcting, or other actions taken subsequent to the audit commencement, but prior to the issuance of the report.

MD 325.10 Amended also states than an agency response shall clearly describe the agency's concurrence or non-concurrence with individual findings and recommendations, and reasons therefore.

Therefore, in accordance with MD 325.10 Amended, the Department's response is attached.

Sincerely,

E. Christopher Abruzzo
Secretary

cc: Jeffrey M. Logan
John Kaschak

1. **DEP does not concur with Finding One**

DEP disagrees with the Auditor General's finding that it did not routinely and consistently issue orders requiring oil and gas operators to restore or replace adversely impacted water supplies as required by law.

The Auditor General's report states that Section 3218(b) of Act 13 directs that DEP "shall issue orders" requiring operators to restore or replace water supplies that have been adversely impacted from oil and gas activities and concludes that DEP *must* issue an order in every case where it makes a positive determination. The Auditor General's interpretation of Section 3218(b) ignores the full text of that provision. The pertinent portion of Section 3218(b) states that DEP "shall issue orders to the well operator *necessary to assure compliance...*" [with the operator's obligation to replace or restore the adversely impacted water supply]. (emphasis added.) Accordingly, there is no legal basis for the Auditor General's conclusion that DEP *must* issue an order every time a water supply is impacted by unconventional gas well activities. The law only requires that DEP issue an order when an operator responsible for adversely impacting a water supply refuses to restore or replace the water supply.

As a regulatory agency, DEP is authorized to exercise discretion with respect to the enforcement of the laws it administers.[1] DEP is best situated to assess whether a regulatory violation has occurred and what method of enforcement is best suited to achieve compliance with the law. Pursuant to this exercise of discretion, DEP often works cooperatively with operators to secure voluntary compliance with respect to restoring or replacing a water supply impacted by oil and gas activities. As a result, many water supply complaints are resolved by operators *before* DEP completes its investigation, and operators have often agreed to voluntarily restore water supplies that DEP cannot conclusively determine were impacted by oil and gas activities.

Because DEP has declined to automatically issue orders every time a positive water supply determination is made, the Auditor General unfairly concludes that DEP acted inconsistently with respect to unconventional gas well operators who adversely impacted water supplies. DEP's goal is to ensure compliance with the provisions of Act 13 and all related regulations. Although a forceful regulatory approach may be utilized to achieve that end, DEP has found that working with operators to obtain voluntary compliance with the law is often a more effective and expeditious method of restoring water supplies. Additionally, Section 3251(a) of Act 13 provides for conferences between DEP and operators to "discuss and attempt to resolve *by mutual agreement* a matter under this chapter." (emphasis added.) This statutory provision reflects the General Assembly's intent that DEP be afforded the discretion to seek voluntary compliance from operators with respect to water supply complaints rather than automatically issuing an order. If voluntary compliance cannot be obtained from an operator, DEP is still able to pursue restoration or replacement of an impacted water supply through the issuance of an order.

[1]It is a fundamental principal that an administrative agency, such as DEP, is vested with discretion in its enforcement of the laws that it is charged with administering. *Schneiderwind v. Department of Environmental Protection*, 867 A.2d 724, 727 (Pa. Cmwlth 2005); *Commonwealth v. Sanico, Inc.*, 830 A.2d 629 n. 14 (Pa. Cmwlth 2003); *.Lerro v. Upper Darby Township*, 798 A.2d 817, 822 n. 13 (Pa. Cmwlth 2002).

The audit report confirms that DEP has successfully protected water supplies adversely impacted by oil and gas activities. The Auditor General reviewed 15 water supply complaint files containing positive determinations that a gas well operator had adversely impacted a water supply. The audit report claims that DEP issued only one order to an operator to restore or replace an impacted water supply and chose instead to seek voluntary compliance from operators with respect to the remaining 14 complaints. Actually, the 15 hard-copy complaint files indicate that three orders were issued to operators by DEP and a fourth order is pending for the replacement or restoration of adversely impacted water supplies. Additionally, 4 of the 15 complaints were not related to unconventional gas drilling activities and were handled by DEP's Mining or Water Programs rather than the Oil and Gas Program. With respect to the 11 complaints actually related to unconventional gas well activities, 10 water supply owners have already received a replacement water supply from the responsible operator, and one operator's plan to permanently replace the complainant's water supply is currently being reviewed for approval by DEP. A positive determination letter was issued by DEP in 9 of the 11 complaints related to unconventional gas well activities and a total of $848,250.00 in civil penalties was assessed against operators.

Interestingly, the audit report cites a portion of an email exchange between a DEP inspector and an unconventional gas well operator as an example of DEP's "conciliatory" approach towards operators. However, the inspector's approach in this instance was successful as the operator permanently restored the complainant's water supply and DEP ultimately issued a civil penalty of over $145,000.00.

DEP does not concur with Recommendation No. 1

DEP disagrees with the Auditor General's recommendation that it must routinely and consistently issue orders to operators whenever it determines that water supplies have been adversely impacted by oil and gas activities to assure restoration or replacement of water supplies.

Contrary to the Auditor General's interpretation of Section 3218 of Act 13, DEP is not legally required to automatically issue orders to unconventional gas well operators to restore or replace adversely impacted water supplies. Consequently, DEP does not agree that it should "routinely and consistently" issue orders to operators for the restoration or replacement of adversely impacted water supplies when operators have already voluntarily complied with the law. However, where liability for a water supply impact is clear, and the responsible operator refuses or unreasonably delays the replacement or restoration of a water supply, DEP exercises its enforcement authority and issues orders as necessary pursuant to Act 13.

Although DEP does not agree that it must routinely issue an order whenever a water supply is impacted by oil and gas activities, DEP will take documented enforcement action (including a Notice of Violation) against any operator that adversely impacts a private or public water supply. The enforcement action will become part of an operator's compliance record and will be available for public review on eFACTS.

DEP does not concur with Recommendation No. 2

DEP disagrees with the Auditor General's recommendation that it amend its internal policy to clearly indicate that orders must be issued whenever DEP makes a positive determination under Section 3218 of the Act.

Based on the Auditor General's misinterpretation of Section 3218 of Act 13, the audit report recommends that DEP issue an order to a gas well operator even if the operator has already acknowledged responsibility for adversely impacting a water supply and has fully remedied the problem to the satisfaction of the water supply owner and DEP. Simply stated, it makes no sense for DEP to issue an order directing an operator to restore or replace an impacted water supply that the operator has already fixed. Although DEP disagrees with the Auditor General's recommendation, DEP remains committed to issue orders as necessary to obtain compliance with Act 13 and to take documented enforcement action against any operator that adversely impacts a water supply as a result of oil and gas activities.

2. **DEP does not concur with Finding Two**

DEP disagrees with the Auditor General's finding that its communications to complainants regarding potential adverse impacts to their water supplies were neither clear nor timely.

The audit report documents a limited number of instances where DEP failed to clearly and/or timely communicate the results of water supply investigations to complainants. The Auditor General's finding is based on isolated examples and not representative of DEP's overall performance. (See Management Directive 325.10 Amended as referenced above.) Nonetheless, DEP acknowledges that all citizens of the Commonwealth are entitled to and should receive clear and timely responses to their complaints.

Prior to the commencement of the Auditor General's special performance audit, DEP recognized the need to address all water supply complaints in a consistent manner throughout the Commonwealth. DEP also realized that water supply determination letters should be simplified for complainants' ease of understanding. Accordingly, DEP is currently drafting standardized determination letters that will clearly explain the results of a water supply investigation in understandable terminology, provide water sample test results in a simplified fashion, and provide useful information to complainants on how to proceed following the conclusion of an investigation. Currently included with all water supply determination letters is a pamphlet authored by the Pennsylvania State University, a preeminent authority in the oil and gas field, which explains the technical aspects of DEP's water testing analysis and provides guidance to complainants on how to interpret laboratory test results.

Additionally, the audit report properly highlights the importance of conducting water supply investigations in a timely manner. DEP's goal is to respond to water supply complaints within 48 hours of receipt and make conclusive determinations regarding water supply impacts within 45 days. Although DEP strives to resolve all water supply complaints within 45 days, some water supply investigations cannot be concluded within that timeframe. For instance, as the Auditor General's report correctly notes, water supply complaints involving stray gas migration are typically complex and require extensive isotopic testing at private laboratories. Consequently, a 45-day timeframe to complete these types of water supply investigations is unrealistic.

DEP has an obligation to protect public health and safety and to safeguard the environment. Accordingly, DEP is committed to conducting a thorough and complete investigation for all water supply complaints it receives. In those instances when DEP cannot make a conclusive determination within 45 days of receiving a water supply complaint, DEP's policy is to notify the complainant in writing of the status of the investigation, provide a summary of the investigation, and explain that additional time is needed to reach a final determination.

DEP concurs with Recommendations No. 3

DEP agrees with the Auditor General's recommendation that it clearly identify and address all complaints that fall under the provisions of Act 13 within the mandated timeframes, and document the dates accurately for response and determination to support compliance with Act 13.

In October 2013, DEP instituted a policy requiring all water supply complaints that fall under the provisions of Act 13 to be entered into DEP's Complaint Tracking System (CTS) upon receipt, or as soon thereafter as possible. Additionally, DEP has implemented measures to ensure that it responds to all water supply complaints within the statutory timeframe of 10 days and all response and determination dates are accurately documented in CTS.

DEP concurs with Recommendation No. 4

DEP agrees with the Auditor General's recommendation that if it cannot respond to water supply complaints or conclude investigations in a timely manner, it should ensure that the reasons are documented in the pertinent complaint file.

DEP's goal is to respond to all water supply complaints and conclude its investigations in a timely manner. However, in those instances where a conclusive determination regarding a water supply impact cannot be made within 45 days, a letter is sent providing the complainant with the status of DEP's investigation, a summary of the investigation, and notice that additional time is necessary to reach a determination.

DEP concurs with Recommendation No. 5

DEP agrees with the Auditor General's recommendation that it send determination letters to complainants for all complaints alleging a water supply impact.

DEP agrees it should notify complainants when it makes a determination regarding a water supply complaint. DEP acknowledges a few instances where determination letters were not sent to complainants. Again, these isolated instances are not indicative of the overall performance of the Oil and Gas Program. In most of the cases identified by the Auditor General, the inspector handling the complaint orally communicated the results of DEP's investigation to the complainant, but did not follow up with a letter. DEP recognizes that although an ongoing dialogue with a complainant during the investigative process is beneficial, a formal written response to all water supply complaints is necessary. Accordingly, DEP's current practice is to issue a determination letter (positive or negative) for any complaint alleging a water supply impact as a result of oil and gas activities. DEP is standardizing determination letters to ensure they communicate the results of DEP's investigation in a clear, thorough, and consistent manner.

DEP concurs in part with Recommendation No. 6

DEP agrees with the Auditor General's recommendation that DEP should develop a water sample test report that is easy to read, but disagrees with the portion of this finding that suggests that DEP should develop its own publications specific to shale gas development to instruct complainants on how to read laboratory results.

DEP has developed a water sample test report that is simple, clear, and easy to read, and has been providing these test reports to complainants for approximately 18 months. However, DEP does not recognize any benefit in developing its own publication to serve as guidance to complainants on interpreting laboratory test results. The current publication provided to complainants along with determination letters was developed by the Pennsylvania State University, a recognized authority in the oil and gas field, and effectively explains how to interpret laboratory test results.

DEP does not agree or disagree with Recommendation No. 7

DEP has no position with respect to the Auditor General's recommendation that the General Assembly should evaluate whether the 45-day resolution mandate is realistic for cases involving stray gas migration and amend Act 13 to allow for more time to complete an investigation if the current timeframe is deemed unrealistic.

DEP's goal is to conclude all water supply investigations within 45 days. However, some water supply investigations, primarily cases involving stray gas migration, cannot realistically be concluded within 45 days due to the complexity of the laboratory testing process. In those cases, DEP's policy is to notify the complainant in writing that additional time is needed to complete the investigation.

DEP will continue to strive to complete all water supply investigations within 45 days and will ensure that its policies and procedures are consistent with any new standards that may be enacted by the General Assembly.

3. **DEP does not concur with Finding Three**

DEP does not agree with the Auditor General's finding that it utilizes an ineffective complaint tracking system that does not provide management with timely and accurate complaint information related to oil and gas activities.

DEP's Complaint Tracking System (CTS) is an internal complaint management tool developed for the entire Department, rather than just the Oil and Gas Program. With the recent expansion of unconventional oil and gas activities, it became apparent to DEP that CTS lacked some functionality with respect to tracking data specific to the Oil and Gas Program. Accordingly, DEP's Bureau of Information Technology made numerous adjustments to CTS in July 2011 and July 2012 to allow for more precise tracking of information related to water supply complaints. Many of the criticisms contained in Finding Three of the audit report have already been addressed -- DEP currently has the ability to track the following information in CTS:

- Number of individual complaints received
- Number of complaints related to unconventional gas well activities
- Number of complaints alleging water supply impacts

The Auditor General expressed concern over DEP's inconsistent use of text fields to track water supply complaints and the unavailability of a "clickable" data check box in CTS. DEP recognizes that recording and maintaining accurate data with respect to water supply complaints is essential to protecting water quality and assuring transparency to the public. Accordingly, DEP implemented a "Response Management Policy" in October 2013 requiring that staff enter all water supply complaints into CTS upon receipt or as soon thereafter as possible. Additionally, this policy requires that water supply complaints be prioritized upon entry into CTS. Additionally, emphasis has been placed on training DEP staff to ensure the proper entry of data into CTS for all water supply complaints, including use of the "water supply impact" check box which has been available in CTS since 2012.

The Auditor General identified complaints where sparse information was found in CTS, but the hard-copy file contained "hundreds of pages of notes, pictures, lab results, and other documents." DEP is committed to accurately record all significant information regarding water supply complaints in CTS. In October 2013, DEP instituted a policy requiring that inspection findings, complaint and witness statements, photographs, and sample results must be documented and electronic copies of all attached to the appropriate complaint record in CTS. As a result, although CTS is not a substitute for a hard-copy file and cannot be expected to contain every aspect of a water supply complaint investigation, pertinent information regarding a water supply investigation can currently be found in CTS. Additionally, a hard-copy file for each complaint containing *all* investigative information is stored in the regional office where the complaint originated.

The Auditor General is especially critical of a complaint received by DEP alleging that gas well drilling impacted a water supply, rendered the water supply undrinkable, and caused

complainant's animals to become ill. The audit report expressed concern regarding the lack of documentation of this incident in CTS. However, as DEP explained to the audit staff, the complaint in question was immediately identified by the inspector as a water quality issue *unrelated to oil and gas activities*. Accordingly, the complaint was forwarded to DEP's Bureau of Water Quality for investigation. Information regarding this complaint is readily available in the hard-copy file located in DEP's regional office; however, the auditors chose not to review the file.

The audit report also discusses an individual who expressed concern to the Auditor General about DEP's response to his complaint. The report concludes that the inability to locate this individual's complaint in CTS highlights DEP's failure to properly track water supply complaints. DEP strongly disagrees that this complaint supports the Auditor General's criticism regarding DEP's handling of water supply complaints. The complaint at issue did not allege a water supply impact nor was it related to unconventional gas well activities. Instead, the complainant expressed concerns regarding DEP's inspection policy and the condition of his property following an operator's restoration of a conventional well site. In any event, the complaint was submitted directly to the Secretary of DEP who personally responded to the complainant. The complaint was not entered into CTS because it involved DEP policy and all policy concerns are maintained in the Secretary's log letter system rather than CTS. This tracking system fully meets DEP's operational needs and has no impact on the Department's ability to track.

Finally, the audit report notes that it took an inordinate amount of time for DEP to provide requested electronic data regarding complaints related to water quality. However, the delay in responding to the Auditor General's requests for electronic data resulted primarily from the auditing staff's failure to comprehend DEP's Environment Facility Application Compliance Tracking System (eFACTS) and CTS. The auditors' unfamiliarity with these systems limited their ability to properly formulate requests for information. Nonetheless, DEP staff diligently responded to all requests from audit staff, engaged in over 50 hours of personal meetings, and provided over 2 million bits of unique data covering a four year period.

DEP concurs with Recommendation No. 8

DEP agrees with the Auditor General's recommendation that it develop a viable plan for complaint tracking and response and study its statutory mandates to determine what information must be captured to ensure complaints are entered in the database in a timely manner; what information is needed to facilitate effective responses to complaints; what information must be captured to answer key questions about complaints, responses, and important trends; and what information must be captured to ensure all complaint information is available to inspectors because these Standard Operating Procedures already exist.

DEP has already implemented this recommendation by updating the Standard Operating Procedure (SOP) for Complaint Response Management in October 2013. This SOP provides guidance to all DEP program staff for managing complaint responses and data associated with

complaints. Each individual program area is responsible for determining what information should be captured in CTS. For example, the CTS screen available to an oil and gas inspector is tailored to the specific information needed to be captured when investigating an oil and gas related complaint. This screen can be updated as the program identifies new information needed to be captured, but those changes will only be reflected in data entered into the system after the update has occurred. However, DEP lacks the staff to continuously go back through old data files and update CTS.

DEP concurs in part with Recommendation No. 9

DEP agrees in part with the Auditor General's recommendation that it should determine the best information technology platform to capture the information needed by DEP to track complaints and facilitate timely responses.

CTS was designed to allow DEP to manage complaints across a wide spectrum of Departmental programs. The system can be updated to segregate information specific to a particular program, but was never intended to provide the type of data collection envisioned by the Auditor General. Nonetheless, DEP agrees that it should continue to update CTS when necessary to maximize the Department's ability to capture information necessary to track complaints.

Contrary to the Auditor General's recommendation, DEP does not rely on CTS to facilitate timely responses to water supply complaints. Once a complaint is received and assigned to an inspector, an investigation is conducted and the pertinent information regarding that investigation is recorded in CTS. However, CTS does not impact an inspector's response time with respect to a complaint.

DEP concurs with Recommendation No. 10

DEP agrees with the Auditor General's recommendation that it ensure that field staff comply with its newly revised policy on complaint handling procedures and provide training to ensure that all pertinent information regarding complaints is captured in the CTS database in a timely manner.

DEP will continue to train staff regarding compliance with its Response Management Policy to ensure all pertinent water supply complaint information is recorded in CTS in a timely manner.

DEP does not concur with Recommendation No. 11

DEP does not agree with the Auditor General's recommendation that it track complaints on a one-to-one basis or that each complainant should receive a unique CTS complaint identification number.

DEP disagrees with the Auditor General's recommendation that it should track complaints on a one-to-one basis. Under DEP's current complaint tracking system, every complaint received by DEP is assigned a unique complaint number which is specific to the incident at issue. Every

individual notifying DEP of a complaint related to that incident is provided with that unique complaint number. Accordingly, every complaint can have multiple complainants, thus eliminating the need for repetitive entry of the same complaint information. The names and contact information for all complainants are documented under that unique complaint number so that all future correspondence regarding that complaint can be forwarded to the interested parties.

The audit report also notes that DEP staff failed to enter complaints into CTS on a one-to-one basis. Consequently, the report concludes that DEP cannot easily track or aggregate the total number of water supply complaints received. DEP disagrees with the Auditor General's conclusion. DEP's current practice of assigning a unique complaint number to each incident and grouping all complaints received regarding that incident with the unique complaint number is the most effective method of recording water supply complaints in CTS. Multiple complaints regarding the same incident are noted in CTS, but still constitute <u>one</u> water supply incident. Multiple complainants can be linked to one complaint, thus eliminating the need for repetitive entry of the same complaint information into CTS, but still allowing aggregate reporting. DEP believes that assigning separate complaint numbers to multiple complainants with respect to the same incident would be contrary to efficient data management and a misuse of staffing resources.

4. **DEP does not concur with Finding Four**

DEP does not agree with the Auditor General's finding that it could not provide reliable assurance that all active shale gas wells were inspected timely.

The audit report correctly notes that DEP's gas well inspection policy, which was developed over 25 years ago, is outdated in light of the recent expansion of unconventional gas well activities. The inspection policy developed by DEP in 1989 only contemplated conventional oil and gas wells which are typically drilled in a few days, rather than unconventional wells which can require weeks or even months to complete.

DEP acknowledges that an updated well inspection policy is needed to meet the unique concerns of unconventional gas well drilling and is considering alternatives to its current policy. Meanwhile, DEP is committed to inspecting all unconventional gas wells during "critical stages" of the well construction process. The critical stages of well construction are outlined in Section 3211(f)(2) of Act 13 and include cementing of casing strings, conducting pressure tests of the production casing, well stimulation, and abandoning or plugging a well. Pursuant to Act 13, operators are required to notify DEP of the commencement of all critical stages of well construction so that DEP inspectors can monitor well development and plan inspections accordingly. Additionally, DEP will require gas well operators to conduct quarterly inspections of the mechanical integrity of their active wells and self-report this information annually to DEP. This approach will be a valuable supplement to DEP conducted inspections.

The audit report finds that DEP's electronic data cannot be used to measure the timeliness and frequency of DEP's inspections of unconventional gas wells. The report focuses on the difficulty auditors encountered while attempting to gather electronic data they deemed critical to a performance audit from CTS, eFACTS, and Oil and Gas Production Reports. Although the information needed to analyze the timeliness and frequency of DEP inspections is contained in the hard-copy file for every well, the Auditor General attempted to conduct a performance audit based almost exclusively on electronic data. Unfortunately, limitations with respect to the detail and organization of data maintained electronically by DEP during the audit period frustrated the auditors' ability to easily extract the information they sought. DEP acknowledges that the quantity and quality of gas well data captured and maintained electronically was limited in the past. However, as a result of Act 13 notification requirements, as well as changes made internally by DEP to its eFACTS input screens, the electronic data sought by the audit staff is being made more accessible and will be available to the general public to review information related to oil and gas activities.

Finally, the audit report erroneously claims that the timeliness and frequency of gas well inspections is dependent on the reliability of electronic data and that absent accurate electronic records the inspection process will suffer. DEP recognizes that maintaining accurate and reliable electronic information related to gas well inspections is important to both the Department and the general public. However, the management of gas well inspections is not dependent on stored electronic data. Rather, individual inspectors meet regularly with their supervisors to discuss inspection activities and are well aware of what is happening in their zone of responsibility with

respect to gas well development. This "human element" of the inspection process is independent of any electronic data storage system. Although DEP agrees that during the audit period eFACTS was not an ideal platform upon which to base an analysis of gas well inspections, there simply is no factual basis to conclude the limitations of electronic data negatively impacted the timeliness and frequency of gas well inspections.

The difficulty in relying exclusively on electronic data to conduct a performance audit was demonstrated by the Auditor General's failed attempt to analyze the timeliness and frequency of DEP's inspections of gas wells based solely on the "spud date" contained in eFACTS.[2] The auditors utilized eFACTS to identify the spud date for a sample of wells and then calculated the number of days elapsed from spud date until a well inspection was documented in eFACTS. DEP explained to the audit staff that spudding is the first step in the well construction process and is not considered a date which would typically warrant a DEP inspection. DEP also advised the auditors that well drilling and completion dates, which merit inspections and are therefore relevant to evaluating inspection performance, are recorded in the hard-copy files rather than eFACTS. Unfortunately, the auditors declined to review the hard-copy files for the sample wells. Consequently, using the electronic spud date to analyze the timeliness and frequency of inspections, rather than the well drilling and completion dates, frustrated the Auditor General's ability to reach a reliable conclusion with respect to well inspection performance.

DEP concurs with Recommendation No. 12

DEP agrees with the Auditor General's recommendation that it should develop an internal policy that outlines the requirements of timeliness and the frequency of inspections.

As previously discussed, DEP recognizes that its current policy regarding gas well inspections is outdated in light of the rapidly expanding unconventional oil and gas industry. Accordingly, DEP is considering an updated gas well inspection policy that is clear, comprehensive, and practical. In the meantime, DEP continues to schedule unconventional gas well inspections to coincide with the critical stages of well development. In this manner, DEP can ensure that inspector resources are maximized and that public health and safety are fully protected.

DEP concurs in part with Recommendation No. 13

DEP agrees in part with the Auditor General's recommendation that it should inspect shale gas wells, at a minimum, at least once a year.

DEP's current practice is to inspect unconventional gas wells at all critical stages of well development. These critical stages are typically completed within a one year period, so most new unconventional gas wells are inspected several times during the course of a year. Additionally,

[2] Act 13 requires that unconventional gas well operators electronically notify DEP of the spud date for a well. Spud date is defined by the Act as the commencement of drilling activities. This information is maintained electronically in eFACTS.

operators of unconventional gas wells will be required to self-inspect the mechanical integrity of their wells on a quarterly basis and report the inspection results annually to DEP.

DEP concurs with Recommendation No. 14

DEP agrees with the Auditor General's recommendation that it should hire additional inspectors to meet the expected demands from shale gas well development.

With the recent implementation of increased permitting fees for unconventional gas wells, DEP expects that additional funding will be available to enable it to augment its Oil and Gas Program complement by at least 25 new employees. It is anticipated that this increased staffing will include a significant number of inspectors.

DEP concurs with Recommendation No. 15

DEP agrees with the Auditor General's recommendation that it should verify that drilling dates reported by operators actually correspond to the start of each drilling phase so that DEP can ensure that timely inspections are conducted during each critical phase of the drilling process.

Pursuant to Act 13, operators are required to provide DEP with notice of all critical stages of unconventional gas well development. Consequently, inspectors are able conduct inspections of gas wells consistent with each critical stage of well development.

DEP concurs with Recommendation No. 16

DEP agrees with the Auditor General's recommendation that it should record and report publically all dates reported by operators of the critical drilling stages. DEP also agrees that electronic records should be used to evaluate its performance with regard to inspections, in aggregate.

Although there is no legal requirement to report publically the critical stage dates of well development, DEP plans to make this information available on its website. Additionally, DEP agrees that using the information posted in eFACTS to evaluate performance with regard to gas well inspections is appropriate.

5. **DEP does not concur with Finding Five**

DEP does not agree with the Auditor General's finding that absent a manifest system to track waste, DEP relies upon a disjointed process of utilizing three different reports and self-reporting by operators with no assurances that waste is disposed of properly.

Under DEP's existing waste management system, generators of oil and gas waste must retain records of waste generated, transported, and disposed. Those records must be made available to DEP upon request, which normally occurs during a complaint investigation or regulatory inspection. Each of the six DEP regional offices takes complaints of illegal waste disposal very seriously, thoroughly investigates reported incidents, and aggressively pursues violations when discovered.

Since the expansion of the unconventional oil and gas industry in Pennsylvania, DEP has actively engaged the industry across all program areas to inform and educate gas well operators on the numerous rules and regulations with which they must comply. DEP staff frequently participates in seminars and meetings with industry and routinely engages in informal communications to explain the requirements of the Solid Waste Management Act and applicable rules and regulations. Much of the wastewater generated by the oil and gas industry is recycled and reused during the development of new gas wells. The recycling and reuse of gas well waste water minimizes the need to withdraw fresh water from our streams, preserving the Commonwealth's natural resources and further protecting the public health and safety.

It should be noted that DEP's practice of requiring the oil and gas industry to self-report waste disposal information is consistent with the manner in which waste data is reported to DEP by other industries as well.

DEP does not concur with Recommendation No. 17

DEP does not agree with the Auditor General's recommendation that it should implement a manifest system in order to thoroughly track waste and its disposal.

There are no provisions in Act 13, the Solid Waste Management Act, or the regulations promulgated thereunder that require a manifest system for oil and gas waste. Additionally, it is unlikely that a manifest system for oil and gas waste would yield any significant benefits over the current waste management system employed by DEP. From a cost benefit analysis, DEP does not believe the potential benefit derived from a waste manifest system would outweigh the corresponding administrative, staffing, and oversight costs of such a system.

DEP concurs with Recommendation No. 18

DEP agrees with the Auditor General's recommendation that it should review and cross check self-reported waste data from drillers, haulers, and disposal facilities so

that DEP can track wastes related to shale gas well drilling to ensure that operators handled waste properly and that the waste was ultimately disposed of properly and in compliance with all pertinent laws.

DEP does not agree that cross checking all self-reported waste data from drillers, haulers, and disposal facilities is the most efficient use of its resources. However, DEP believes that random cross checking of specific self-reported waste data is a valuable regulatory tool and utilizes this approach whenever practical to monitor oil and gas waste management.

DEP does not concur with Recommendation No. 19

DEP disagrees with the Auditor General's recommendation that it should verify the self-reported waste data it obtains from operators, haulers, and disposal sites for completeness and accuracy before posting the data on its website.

DEP shares the Auditor General's concern about transparency and has addressed that concern by posting self-reported oil and gas waste data on its website. However, verifying the accuracy of all waste data obtained from operators, haulers, and disposal sites prior to posting that information on DEP's website would place an enormous burden on the Department's resources. If DEP becomes aware of inaccurate data on its website, immediate corrective action is taken to ensure the public has access to reliable information.

6. **DEP does not concur with Finding Six**

DEP disagrees with the Auditor General's finding that its website lacks transparency and accountability to the public.

Initially, it must be noted that eFACTS is a database for all DEP programs, not just the Oil and Gas Program. The eFACTS system is designed so that information for any regulated facility in the Commonwealth, not just unconventional gas wells, is available to the public.

DEP offers two Geographic Information System (GIS) maps: (1) eMapPA includes all information from the eFACTS function; and (2) PA Oil and Gas Mapping tool focuses on oil and gas activities. These two systems are purposefully designed so that one map includes all DEP regulated information and the second map focuses on information specific to oil and gas activities. This feature helps narrow the search for individuals looking for just oil and gas related information. To facilitate improved transparency and ease of use of its website, DEP is considering linking eFACTS to the Oil and Gas Mapping application.

Oil and Gas Interactive Reports are a subset of eFACTS data and are grouped to provide frequently requested information related to unconventional gas well activities. These reports were developed to meet the needs of the public, as well as the oil and gas industry, based on the frequently requested DEP data sets. Links to the mapping tools or other reports are feasible and DEP is considering the applicability of that feature.

The Oil and Gas Reporting (OGRE) website is used by the oil and gas industry to self-report production data, waste data, operator information, and well site information. Within the Production Report feature of OGRE, a user can input operator name, operator number, or eFACTS client ID to search for production information for unconventional wells, home use wells, and non-producing wells.

eNOTICE is used by DEP's Office of Environmental Advocate across all DEP programs to alert interested parties about specific "trigger permits" in locations that qualify as Environmental Justice areas. This feature requires the Environmental Advocate to monitor trigger permits statewide and distribute emails with information regarding the permit and project to specific subscribers.

Although DEP's website does not provide the public with the ability to instantly access the information DEP collects and electronically maintains, the Auditor General erroneously concludes that the website lacks transparency and accountability to the public. In fact, any and all information maintained electronically by DEP for specific gas wells is accessible to the public through several website features. The limitations of DEP's website with respect to linking reports does not equate to a lack of transparency or accountability to the public.

Additionally, DEP believes it is unfair to assess the transparency of its regulatory efforts based solely on the accessibility of information made available to the public on its website. It has been DEP's longstanding practice to provide the public with broad access to all non-privileged information in its possession via the file review process. Any individual seeking information

about an unconventional gas well can make arrangements with the appropriate DEP regional office to review the hard-copy file for the well. This file contains everything relevant to a specific well, including information not available on DEP's public website. DEP believes its open file review policy ensures complete transparency and will continue to offer this option to the general public.

DEP disagrees with the Auditor General's finding that it does not provide adequate transparency when there are adverse impacts to private water supplies. The Auditor General's conclusion is based on DEP's failure to make CTS available to the public. However, CTS is used by inspectors, compliance officers, and management staff to internally track ongoing complaint investigations and is not a substitute for the official case files maintained in DEP's regional offices. Although CTS cannot be made available to the general public, DEP appreciates the public's interest in accessing aggregate information regarding water supply complaints. Accordingly, DEP is considering posting information on its website regarding the number of private and public water supply complaints received and number of positive/negative determination letters issued.

While DEP understands the Auditor General's preference for a record storage system that is based strictly on electronic data, the reality is that DEP, like most government agencies, still relies heavily on paper records. DEP is making strides to transition to a completely electronic record storage system, but that conversion process is expensive and time consuming. Nonetheless, DEP's goal is that all records related to unconventional oil and gas activities will eventually be submitted to the Department and maintained in an electronic format that is easily accessible to the general public.

Finally, DEP is augmenting its electronic record retention platform by developing electronic self-reporting systems for industry and transitioning to electronic permit applications. Unfortunately, these efforts have been hampered by large scale layoffs in FY 2009-2010 which resulted in the loss of 183 positions. The majority of these layoffs involved information technology and clerical staff in the central and regional offices. This additional staff could have assisted in meeting DEP's goals long before the audit was conducted.

DEP concurs in part with Recommendation No. 20

DEP agrees with the Auditor General's recommendation 20(a) to provide an easy access portal to all of the reports available to the public related to shale gas activities in the state.

DEP's main web page already provides a left-hand navigation link to the Oil and Gas Program page. That page includes links to the Oil and Gas Interactive Reports and all other reports related to oil and gas activities in the Commonwealth. DEP does not believe that adding a specific hyperlink to its main web page to access this information adds any additional transparency.

DEP agrees with the Auditor General's recommendation 20(b) to incorporate a feature that allows users to search eFACTS specific to shale gas activities.

DEP already provides this feature in the Oil and Gas Interactive Reports.

DEP agrees with the Auditor General's recommendation 20(c) to make the name search function consistent on eFACTS so that an operator can be easily identified.

The name search function on eFACTS is already consistent. The business name DEP uses for eFACTS is the name associated with the permitted activity. At this time, key name identifiers are not feasible for eFACTS.

DEP agrees with the Auditor General's recommendation 20(d) to link eFACTS data to the Oil and Gas Compliance Reports inspection data and to the Oil and Gas Production Reports so that production data can easily be tied to other information presented.

To facilitate public access to comprehensive information regarding a specific unconventional gas well, DEP will enhance the functionality of its Oil & Gas Mapping application. This feature will eventually provide production data, copies of permit documents, and other well specific information.

DEP agrees in part with the Auditor General's recommendation 20(e) to eliminate the duplicative mapping features on the website or update the eMapPA application to make it more user-friendly with regard to eFACTS queries.

DEP will continue to use both mapping tools on its website, but will update the eMapPA function to make it more user-friendly as resources and technology become available.

DEP disagrees with the Auditor General's recommendation 20(f) to provide a notification about completed shale gas well inspections with the eNOTICE feature and include a link to the completed inspection report.

Based on the data management requirements implicated by this recommendation, it is neither feasible nor cost effective to utilize the eNOTICE feature to notify the general public of the thousands of gas well inspections conducted annually by DEP. Additionally, since inspection reports are currently not available electronically, DEP does not have the capability to meet this recommendation. Until inspection records are maintained in electronic format, interested individuals are encouraged to review the hard-copy files or utilize eFACTS to view updates to any DEP regulated entity's inspection history.

DEP agrees with the Auditor General's recommendation 20(g) to include on DEP's website complaint information, in the aggregate, such as the number of complaints received, the number of complaints that resulted in an investigation, and the number of water supplies impacted by oil and gas activities.

DEP currently provides information related to water supply enforcement actions on its public website and regularly responds to press inquiries requesting aggregated water supply complaint information. DEP is considering the feasibility of posting aggregated information regarding water supply complaints on its website.

DEP disagrees with the Auditor General's recommendation 20(h) to post determination letters on its website with confidential information redacted.

DEP does not post determination letters on its website in order to protect the privacy of complainants. Additionally, DEP believes that posting redacted determination letters on its website would be of little practical value to the general public. These letters merely indicate whether a water supply was impacted by gas well activities and do not include a complete picture of a water supply investigation. However, all of the information regarding a water supply investigation is contained in a hard-copy file and is available to the public pursuant to Pennsylvania's Right-to-Know Law.

DEP disagrees with the Auditor General's recommendation 20(i) to post information regarding cases of subterranean water supply contamination from any oil and gas related sources whatsoever.

DEP disagrees with the Auditor General's recommendation that it should post on its website all confirmed cases of water supply contamination from any oil and gas related source. To be clear, Section 3218(b.4) of Act 13 requires DEP to publish on its website "lists of confirmed cases of subterranean water supply contamination that result from hydraulic fracturing." DEP does not agree with the Auditor General's interpretation that the term "hydraulic fracturing" was intended by the legislature to refer to the entire well construction process. Hydraulic fracturing is only a part of the well development process. The General Assembly made a conscious decision to single out that specific activity with regard to DEP's obligation to post water supply contamination cases. DEP does not believe the legislature misunderstood the implications of the terms they specifically used in Act 13. DEP has met the standard set forth by the General Assembly and is committed to complying with any enhanced reporting requirements that may be enacted in the future.

DEP does not agree or disagree with respect to Recommendation No. 21

DEP has no position with respect to the Auditor General's recommendation that the General Assembly should consider amending the provision to require DEP to post information on its website regarding not only definitive confirmed cases, but also any probable cases with credible evidence that oil and gas activities may adversely impact water supplies, whether public or private.

DEP does not have a position with respect to this recommendation, but will comply with any reporting requirements that are mandated by law.

7. **DEP does not concur with Finding Seven**

DEP disagrees with the Auditor General's finding that DEP failed to post online inspection information that is accurate and meets statutory requirements.

DEP has posted all statutorily required inspection information on eFACTS since 2012. Although information regarding operators' responses and remedial actions taken following a violation is not currently available in a format that can be posted electronically, that information is available in the hard-copy files located in DEP's regional offices.

The audit report claims that 25 percent of the inspection reports reviewed contained errors in some of the information posted to eFACTS. DEP acknowledges that errors are likely to occur when manually transferring information from an inspection report to eFACTS. DEP is committed to providing the most accurate information possible on eFACTS and has trained staff regarding the importance of verifying the accuracy of information posted on the website.

The audit report also finds that 76 percent of inspection reports reviewed contained detailed comments that were not posted to eFACTS. This finding is neither unexpected nor problematic. DEP designed eFACTS to be utilized as a tracking system, not as the official record of DEP inspections. The comments recorded in eFACTS are chosen at the discretion of the inspector completing the entry. An inspector will often include voluminous inspection notes in the official hard-copy file, but limit the data entered into eFACTS to only that information which is essential to the case. This is usually a function of an inspector prioritizing the information recorded in eFACTS.

As previously discussed, the complete documentation for any gas well is maintained in a hard-copy file in DEP's regional offices. DEP recognizes the process of reviewing paperwork can be tedious and time consuming, but the files maintained at DEP's regional offices are the official records of DEP's regulatory efforts, not eFACTS. Again, the general public has virtually unfettered access to these records via the file review process.

DEP recognizes that its current paper filing system has limitations. Consequently, DEP has instituted an agency-wide initiative to get all regional and central office filings under the same Records Management System. This system will utilize bar coding so that files can be tracked in the event a file is checked out by staff or misplaced. The conversion process was recently completed in the Northwest and Northcentral Regional Offices and was initiated in October 2013 in the Southwest Regional Office.

It should be noted that the Auditor General's review of water supply complaint files differed from file reviews conducted by the public in that audit staff provided DEP with a list of files they wanted to review upon arrival at a DEP regional office and not in advance, as is required for public file reviews. Because many files involve active cases being utilized by DEP's inspection, legal, and investigative staff, advance notice of a record review provides DEP an opportunity to locate all portions of a file and organize it prior to the review. Nonetheless, DEP staff worked diligently to locate any documents that were not readily available on the day of the auditors'

visit. The fact that a few documents could not ultimately be located is problematic, but full implementation of DEP's Records Management System will eliminate a reoccurrence of this issue.

DEP concurs with Recommendation No. 22

DEP agrees with the Auditor General's recommendation that it should upgrade the information resources available to its inspectors so that inspection reports can be completed electronically and automatically uploaded to DEP's website.

DEP has already provided inspectors with smart phones and laptop computers to facilitate the electronic recording of inspection data in the field, however, internet connectivity and network coverage issues have limited the utility of that equipment. DEP is considering adding a mobile inspection platform that will enable inspectors to upload reports from the field.

DEP concurs with Recommendation No. 23

DEP agrees with the Auditor General's recommendation that inspectors complete inspection reports accurately and comprehensively.

DEP believes that although transcription errors have occurred in eFACTS, the hard-copy inspection reports are typically accurate and comprehensive. DEP is committed to providing training and data entry oversight to ensure all information maintained in eFACTS and DEP's files is consistent and reliable.

DEP does not concur with Recommendation No. 24

DEP disagrees with the Auditor General's recommendation that inspectors' comments related to inspections be reported on its website so that the public has a complete understanding of conditions at oil and gas facilities during inspections.

DEP inspectors are already required to log inspection comments into eFACTS. DEP strongly disagrees with the Auditor General's opinion that truncated inspection comments in eFACTS are misleading to the public as inspectors' unabridged comments are available to the public via the hard-copy files. Nonetheless, DEP is committed to providing further training to inspectors to ensure that all vital information regarding an investigation is properly recorded in eFACTS.

DEP concurs with Recommendation No. 25

DEP agrees with the Auditor General's recommendation that DEP comply with all online reporting mandates and ensure that it posts the operators' responses and remedial actions taken when violations are noted.

DEP's Oil and Gas Compliance Reports satisfy all reporting requirements of Act 13. Information regarding operators' responses and remedial actions taken following a violation is currently not available in a format conducive to electronic posting, but can be found in the hard-copy files in DEP's regional offices. DEP will post this information on its website when it is available in the proper format.

DEP concurs with Recommendation No. 26

DEP agrees with the Auditor General's recommendation that hard-copy inspection reports should be securely maintained.

DEP has implemented a Records Management System in the Central Office as well as the Northcentral and the Northwest Regional Offices, with system implementation initiated in the Southwest Regional Office in October 2013. The Records Management System will ensure that DEP records are securely maintained and provide an increased level of accountability for hard-copy files.

8. **DEP does not concur with Finding Eight**

DEP does not agree with the Auditor General's finding that data collected in eFACTS did not provide DEP with adequate information needed to monitor a growing unconventional oil and gas industry.

This finding focuses on how the Oil and Gas Program was, not how the program is today as a result of changes implemented following a review in 2011 of the technological needs of the program. These changes took time to develop and implement, so they were not necessarily available for the majority of the audit period. The system features the audit staff wanted to utilize, such as a field indicating whether an inspection is related to an impacted water supply, were added in 2012.

DEP agrees with the Auditor General's finding that its user facing data input screens are not as user-friendly as a Microsoft or web-style entry system, but the cost to the Commonwealth to overhaul the entire system is prohibitive. DEP recently implemented the electronic oil and gas well permitting system (eWell) to help convert the permit application and approval process to a completely web-based system. This will assist in making information electronically available to the general public. DEP appreciates the auditors concern that information related to gas wells is not instantly available, but the legacy of a paper-based system is the reality of state government. For the time being, hard-copy files are the best source of information related to permits, inspections, and enforcement actions.

As previously discussed, DEP acknowledges that some of the data maintained in eFACTS has reliability issues due to manual transcription errors. DEP also concedes that eFACTS does not contain all of DEP's inspection information. These issues are inherent in a data system that was never intended as a substitute for a hard-copy file. Consequently, DEP considers eFACTS a starting point for information gathering, not the end point. DEP staff ultimately relies on hard-copy files maintained in the regional offices as those files are the official record of any DEP regulatory action. While DEP's reliance on a paper-based record system made gathering information cumbersome for the audit staff, the system is effectively utilized by trained DEP personnel throughout the Commonwealth.

It should also be mentioned that throughout the Auditor General's review, audit staff was repeatedly warned about the difficulty in attempting to retrieve electronic information with one "push of a button." Despite DEP's proviso, the auditors consistently declined offers to conduct a comprehensive inspection of all relevant hard-copy documents (such as well records) in order to obtain a complete understanding of the Oil and Gas Program. Instead, the auditors insisted on conducting their review based almost exclusively on electronically stored data.

Finally, it is important to note that the limitations of eFACTS have not negatively impacted the Oil and Gas Program's ability to effectively regulate unconventional gas well activities. This conclusion is supported by the fact that nowhere in the Auditor General's 72 page report is there

a single example of DEP's failure to protect a negatively impacted private or public water supply.

DEP concurs with Recommendation No. 27

DEP concurs with the Auditor General's recommendation to determine what information must be captured to ensure compliance with statutes and regulations, ensure operators follow best management practices, and ensure all current inspection and complaint information is available to inspectors in eFACTS. DEP also concurs with the recommendation to identify what data is being captured in external paper reports, spreadsheets, and other informal systems that are not currently captured in eFACTS, and what data is being captured in text fields that should be captured in structured data elements to support trend analysis.

- DEP has already determined what information must be captured to ensure compliance with federal and state statutes and regulations and has consistently captured that data.

- DEP has already determined what information must be captured to ensure operators follow best management practices. This information is available on DEP's public website via a link to Standard Operating Procedures for permits and inspections.

- All current inspection and complaint information is available to inspectors in eFACTS and hard-copy files.

- The external paper reports, spreadsheets, and informal systems referred to in the audit report are often the field notes or personal documents created by inspectors for their own planning purposes, to transfer information once they return to the office from the field, or to track drilling activity in their region. This information is not necessarily relevant to the official inspection report. However, DEP will encourage staff to make sure that all relevant documentation regarding inspections ultimately resides in the hard-copy files.

- DEP already knows what data is being captured in text fields that are needed to support modern data analysis techniques. However, adding fields to the database cannot be accomplished retroactively. Many of the tracking elements the audit staff tried to test DEP data against were implemented subsequent to the audit period. Once again, this recommendation reflects how the Oil and Gas program formerly operated, not how the program operates today.

DEP does not concur with Recommendation No. 28

DEP does not agree with the Auditor General's recommendation that it develop an entirely new data management system.

DEP will continue to use the eFACTS system, as it delivers all the features the Auditor General recommends. The Department can provide additional training to ensure that eFACTS is being used properly and that all information is input correctly so that the record is robust and reflective of the inspection activities taking place. DEP already provides the type of summary information recommended by the Auditor General in the Oil and Gas Interactive Reports.

DEP concurs with Recommendation No. 29

DEP agrees with the Auditor General's recommendation that it develop policies and procedures and provide the necessary training to ensure that all pertinent information about wells and drilling-related activities is captured in the database in a timely manner.

DEP regularly trains new and existing staff on the use of eFACTS and other electronic data systems. The Oil and Gas Program also holds regular statewide staff meetings and a bi-weekly conference call to discuss issues pertaining to the program, as well as the numerous standard operating procedures that apply to the program. DEP will continue to train staff and update policies as needed to ensure that information regarding oil and gas activities is captured in the database in a timely manner.

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