



**COMMONWEALTH OF PENNSYLVANIA  
BEFORE THE ENVIRONMENTAL HEARING BOARD**

**SIRI LAWSON, Appellant** :

:

: **EHB Docket No. 2017-051-B**

:

**COMMONWEALTH OF** :

**PENNSYLVANIA, DEPARTMENT** :

**OF ENVIRONMENTAL** :

**PROTECTION, Appellee** :

:

**and** :

:

**HYDRO TRANSPORT, LLC,** :

**Permittee,** :

:

**and** :

:

**FARMINGTON TOWNSHIP,** :

**Intervenor** :

:

**and** :

**PENNSYLVANIA STATE** :

**ASSOCIATION OF TOWNSHIP** :

**SUPERVISORS** :

**Intervenor** :

**AMICUS CURIAE BRIEF IN SUPPORT OF APPELLANT**



**STATEMENT OF INTEREST OF AMICUS CURIAE**

1. Damascus Citizens For Sustainability (DCS) is a nonprofit, grassroots organization dedicated to protecting clean air, land, and water from pollution caused by the fossil fuel extraction industry, primarily looking at oil and gas. DCS works to provide individuals and communities directly threatened by their processes with the tools necessary to defend themselves. To this end, we routinely provide individuals in Pennsylvania and across the country (and internationally) with information about the way fossil fuels are extracted, processed, etc., the risks those processes pose to human health and the environment, and the federal, state, and local laws, regulations, and policies that govern fossil fuel extraction and related processes.
2. Currently, 4,334 people are signed up as members of Damascus Citizens. We don't require our subscribers to provide their home address; of those that do, more than 500 subscribers list a primary address in Pennsylvania. Many other subscribers have a secondary address in Pennsylvania, own property or have relational or business interests in the Commonwealth, or visit regularly to see family or to enjoy Pennsylvania's amenities. Individual supporters contribute close to one-half of DCS' operating budget.
3. DCS's mission is to protect public health and safety from impacts of the oil and gas industry. While its *raison d'etre* is to respond to hydraulic fracturing, since its inception it has been highly involved in the impacts of, and the regulation and oversight of natural gas production in Pennsylvania, from production to end user



with attention to the wastes produced at each stage and their subsequent disposal. The spread of brine is a disposal method, which impacts DCS members and impacts DCS's ability to fulfill its mission - i.e., protection public health. The substantial, direct and immediate impact if Ms. Lawson's appeal is denied will be that DCS' members will have more brine health problems. Regulatory oversight would be less even than it has been and water and air impacts would increase.

**STATEMENT OF QUESTIONS INVOLVED**

4. Damascus Citizens for Sustainability (DCS) is submitting this amicus curiae brief to underscore the constitutional responsibility of the parties and the Board under the Environmental Rights Amendment ("ERA" or "Section 27") to the Pennsylvania Constitution, found at Article 1, Section 27. The ERA declares that:

The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of the people.

5. The question presented in this case is whether the practice of disposing of liquid waste from oil and gas development through what is referred to as "brine spreading" violates the Environmental Rights Amendment of the Pennsylvania Constitution.

**SUMMARY OF ARGUMENT**

6. The oil and gas industry practice of disposing of waste fluids by dumping them on un-paved roads is commonly referred to as "brine spreading," This practice violates the Environmental Rights Amendment of the Pennsylvania Constitution.



The Commonwealth, the Department of Environmental Protection, and the municipality that will allow or permit brine spreading are violating their trustee responsibilities and obligations under the ERA.

#### **ARGUMENT**

7. As stated by the Supreme Court in *Payne v. Kassab*, 361 A.2d 263,272 (Pa 1976), "There can be no question that the Amendment itself declares and creates a public trust of public natural resources for the benefit of all the people (including future generations as yet unborn) and that the Commonwealth is made the trustee of said resources, commanded to conserve and maintain them."

8. Municipalities, as agents of the Commonwealth, share trustee duties as they carry out their roles in land use planning and regulation. See, *Community College of Delaware County v. Fox*, 342 A.2d 468, 482 (20 Pa. Cmmw, 1975). Indeed, this Board and all of the other courts in the Commonwealth also share responsibilities under the ERA. As the Supreme Court observed in *Commonwealth v. Parker White Metal Co.* 515 A.2d 1358 (Pa. 1986):

In declaring sections 606(a) and 606(b) of the Solid Waste Management Act unconstitutional, the lower court has given little, if any, consideration to the strong and fundamental presumption of constitutionality that must attend judicial review of a legislative enactment. That presumption is further strengthened in this case by the explicit purpose of the Act to implement Article I, section 27 of the Pennsylvania Constitution, a remarkable document expressing our citizens' entitlement and "right to clean air, pure water, and -- to the preservation of the natural, scenic, historic and esthetic values of the environment." The courts of this Commonwealth, as part of a co-equal branch of government, serve as "trustees" of "Pennsylvania's public natural resources," no less than do the



executive and legislative branches of government.... As one of the trustees of the public estate and this Commonwealth's natural resources, we share the duty and obligation to protect and foster the environmental well-being of the Commonwealth of Pennsylvania. Failure to act with vigilance "so as best to achieve and effectuate the goals and purposes" of the Solid Waste Management Act would be detrimental to the public health, safety and welfare, and would be a breach of the public trust. 515 A.2d at 1370-71.

9. The legislative history of the ERA and the environmental background that led to the provisions of Section 27 in Article I of the Pennsylvania Constitution is quite telling. The Supreme Court in *Pennsylvania Environmental Defense Foundation*, No. 10 MAP 2015(Pa. June 20, 2017) ("PEDF") quoted extensively from the Supreme Court's prior plurality opinion in *Robinson Township v. Commonwealth*, 83 A.3d 901(Pa. 2013):

Section 27 contains an express statement of the rights of the people and the obligations of the Commonwealth with respect to the conservation and maintenance of our public natural resources. In *Robinson Township v. Commonwealth*, 83 A.3d 901(Pa. 2013) (plurality), a plurality of this Court carefully reviewed the reasons why the Environmental Rights Amendment was necessary, the history of its enactment and ratification, and the mischief to be remedied and the object to be attained. At the outset of this opinion, we reiterate this historical background, which serves as an important reminder as we address the issues presented in the present case:

"It is not a historical accident that the Pennsylvania Constitution now places citizens' environmental rights on par with their political rights. Approximately three and a half centuries ago, white pine, Eastern hemlock, and mixed hardwood forests covered about 90 percent of the Commonwealth's surface of over 20 million acres. Two centuries later, the state experienced a lumber harvesting industry boom that, by



1920, had left much of Pennsylvania barren. “Loggers moved to West Virginia and to the lake states, leaving behind thousands of devastated treeless acres,” abandoning sawmills and sounding the death knell for once vibrant towns. Regeneration of our forests (less the diversity of species) has taken decades.

Similarly, by 1890, “game” wildlife had dwindled “as a result of deforestation, pollution and unregulated hunting and trapping.” As conservationist John M. Phillips wrote, “In 1890, the game had practically disappeared from our state....

We had but few game laws and those were supposed to be enforced by township constables, most of whom were politicians willing to trade with their friends the lives of our beasts and birds in exchange for votes.” In 1895, the General Assembly created the Pennsylvania Game Commission and, two years later, adopted a package of new game laws to protect endangered populations of deer, elk, waterfowl, and other game birds. Over the following decades, the Game Commission sought to restore populations of wildlife, by managing and restocking species endangered or extinct in Pennsylvania, establishing game preserves in state forests, and purchasing state game lands. Sustained efforts of the Game Commission over more than a century (coupled with restoration of Pennsylvania's forests) returned a bounty of wildlife to the Commonwealth. The third environmental event of great note was the industrial exploitation of Pennsylvania's coalfields from the middle of the nineteenth well into the twentieth century. During that time, the coal industry and the steel industry it powered were the keystone of Pennsylvania's increasingly industrialized economy. The two industries provided employment for large numbers of people and delivered tremendous opportunities for small and large investors.

... “[W]hen coal was a reigning monarch,” the industry operated “virtually unrestricted” by either the state or federal government. The result, in the opinion of many, was devastating to the natural environment of the coal-rich regions of the Commonwealth, with long-



lasting effects on human health and safety, and on the esthetic beauty of nature. These negative effects include banks of burning or non-burning soft sooty coal and refuse; underground mine fires; pollution of waters from acid mine drainage; subsidence of the soil; and landscapes scarred with strip mining pits and acid water impoundments. In the mid-1960s, the Commonwealth began a massive undertaking to reclaim over 250,000 acres of abandoned surface mines and about 2,400 miles of streams contaminated with acid mine drainage, which did not meet water quality standards. The cost of projects to date has been in the hundreds of millions of dollars, and the Department of Environmental Protection

has predicted that an estimated 15 billion dollars is in fact necessary to resolve the problem of abandoned mine reclamation alone. *Id.*

The overwhelming tasks of reclamation and regeneration of the Commonwealth's natural resources, along with localized environmental incidents (such as the 1948 Donora smog tragedy in which twenty persons died of asphyxiation and 7,000 persons were hospitalized because of corrosive industrial smoke; the 1959 Knox Mine disaster in which the Susquehanna River disappeared into the Pittston Coal Vein; the 1961 Glen Alden mine water discharge that killed more than 300,000 fish; and the Centralia mine fire that started in 1962, is still burning, and led to the relocation of all residents in 1984) has led to the gradual enactment of statutes protecting our environment. The drafters of the Environmental Rights Amendment recognized and acknowledged the shocks to our environment and quality of life:

We seared and scarred our once green and pleasant land with mining operations. We polluted our rivers and our streams with acid mine drainage, with industrial waste, with sewage. We poisoned our 'delicate, pleasant and wholesome' air with the smoke of steel mills and coke ovens and with the fumes of millions of automobiles. We smashed our highways through fertile fields and thriving city neighborhoods. We cut down our



trees and erected eyesores along our roads. We uglified our land and we called it progress.

1970 Pa. Legislative Journal—House at 2270 (quoting anonymous 1698 description of Penn's Woods air). With these events in the recent collective memory of the General Assembly, the proposed Environmental Rights Amendment received the unanimous assent of both chambers during both the 1969–1970 and 1971–1972 legislative sessions. Pennsylvania voters ratified the proposed amendment of the citizens' Declaration of Rights on May 18, 1971, with a margin of nearly four to one, receiving 1,021,342 votes in favor and 259,979 opposed. The decision to affirm the people's environmental rights in a Declaration or Bill of Rights, alongside political rights, is relatively rare in American constitutional law. In addition to Pennsylvania, Montana and Rhode Island are the only other states of the Union to do so. *See* Pa. Const. art. I, § 27 (1971); Mt. Const. art. II, § 3 (1889); R.I. Const. art. I, § 17 (1970). Three other states—Hawaii, Illinois, and Massachusetts—articulate and protect their citizens' environmental rights in separate articles of their charters. *See* Hi. Const. art. XI, §§ 1, 9 (1978); Ill. Const. art. XI, §§ 1, 2 (1971–72); Ma. Const. amend. 49 (1972). Of these three states, Hawaii and Illinois, unlike Pennsylvania, expressly require further legislative action to vindicate the rights of the people. By comparison, other state charters articulate a “public policy” and attendant directions to the state legislatures to pass laws for the conservation or protection of either all or enumerated natural resources. *See, e.g.*, Ak. Const. art. VIII, §§ 1–18 (1959); Colo. Const. art. XXVII, § 1 (1993); La. Const. art. IX, § 1 (1974); N.M. Const. art. XX, § 21 (1971); N.Y. Const. art. XIV, §§ 1–5 (1941); Tx. Const. art. XVI, § 59 (1917); Va. Const. art. XI, §§ 1–4 (1971).

Some charters address the people's rights to fish and hunt, often qualified by the government's right to regulate these activities for the purposes of conservation. *See, e.g.*, Ky. Const. § 255A (2012); Vt.



Apr.22.2018 11:24 PM

PAGE. 10/





Const. Ch. II, § 67 (1777); Wi. Const. art. I, § 26 (2003). Still other state constitutions simply authorize the expenditure of public money for the purposes of targeted conservation efforts. *See, e.g.*, Or. Const. art. IX–H, §§ 1–6 (1970); W.V. Const. art. VI, §§ 55, 56 (1996). Finally, many of the remaining states do not address natural resources in their organic charters at all. *See, e.g.*, Nv. Const. art. I, § 1 *et seq.*

That Pennsylvania deliberately chose a course different from virtually all of its sister states speaks to the Commonwealth's experience of having the benefit of vast natural resources whose virtually unrestrained exploitation, while initially a boon to investors, industry, and citizens, led to destructive and lasting consequences not only for the environment but also for the citizens' quality of life. Later generations paid and continue to pay a tribute to early uncontrolled and unsustainable development financially, in health and quality of life consequences, and with the relegation to history books of valuable natural and esthetic aspects of our environmental inheritance. The drafters and the citizens of the Commonwealth who ratified the Environmental Rights Amendment, aware of this history, articulated the people's rights and the government's duties to the people in broad and flexible terms that would permit not only reactive but also anticipatory protection of the environment for the benefit of current and future generations. Moreover, public trustee duties were delegated concomitantly to all branches and levels of government in recognition that the quality of the environment is a task with both local and statewide implications, and to ensure that all government neither infringed upon the people's rights nor failed to act for the benefit of the people in this area crucial to the well-being of all Pennsylvanians. *Id.* at 960-63 (footnotes and some citations omitted)

10. The Supreme Court in *PEDF* also put to rest the persistent notion that the ERA requires further legislative action because, as opponents of the ERA argued,



Section 27 could be read as not being self executing. The Supreme Court responded:

“there can be no question that the Amendment itself declares and creates a public trust of public natural resources for the benefit of all the people (including future generations as yet unborn) and that the Commonwealth is made the trustee of said resources, commanded to conserve and maintain them. No implementing legislation is needed to enunciate these broad purposes and establish these relationships.”

11. This Board and the courts of Pennsylvania have all found that the various environmental statutes of the Commonwealth must be read in a way that makes them consistent with Section 27. Specifically, each of environmental statutes and regulations implemented and enforced by the Department of Environmental Protection has been interpreted so as to embrace the trustee obligations in the ERA to preserve and defend the people’s constitutional rights:

*Clean Streams Law, 35 P.S.691.1 -- See, Commonwealth v. Harmar Coal Co. 306 A.2d 308, 311-312 (Pa. 1973)*

*Air Pollution Control Act, 35 P.S. 4001 – See, Department of Environmental Res. v. Locust Point Quarries, Inc., 396 A.2d 1205, 1206, 1209(Pq. 1979);*

*Solid Waste Management Act, 35 P.S. 6018.101 -- See, Commonwealth v. Packer, 798 A.2d 192, 198-199(Pa. 2002);*

*Sewage Facilities Act, 35 P.S. 750 – See, Community College of Delaware County v. Fox, 342 A.2d 468, 472 (Pa. Comwlth. 1975);*

*Oil and Gas Act, 58 P.S.601.101-102—See, Declaration of Purpose, The purposes of this act are to: (1) Permit the optimal development of the oil and gas resources of Pennsylvania consistent with the protection of the*



health, safety, environment and property of the citizens of the Commonwealth. (2) Protect the safety of personnel and facilities employed in the exploration, development, storage and production of natural gas or oil or the mining of coal. (3) Protect the safety and property rights of persons residing in areas where such exploration, development, storage or production occurs. (4) *Protect the natural resources, environmental rights and values secured by the Pennsylvania Constitution, 58 P.S. § 601.102(emphasis added).* production occurs. (4) *Protect the natural resources, environmental rights and values secured by the Pennsylvania Constitution.*" 58 P.S. § 601.102

12. When looking at governmental responsibilities under the Environmental Rights Amendment, in the June, 2017 decision on PEDF v. Commonwealth of Pennsylvania, Justice Baer stated,

"Through today's decision, this Court takes several monumental steps in the development of the Environmental Rights Amendment, Article I, Section 27 of the Pennsylvania Constitution. I agree with many of the Majority's holdings, including Part IV.A.'s dismantling of the Commonwealth Court's Payne1 test, which stood for nearly fifty years, the confirmation that the public trust provisions of the amendment are self-executing in Part IV.C., and the recognition in footnote 23 that all branches of the Commonwealth are trustees of Pennsylvania's natural resources.<sup>2</sup> These holdings solidify the jurisprudential sea-change begun by Chief Justice Castille's plurality in Robinson Township v. Commonwealth, 83 A.3d 901, 950-51 (Pa. 2013) (plurality), which rejuvenated Section 27 and dispelled the oft-held view that the provision was merely an aspirational statement. With this, I am in full agreement."

13. It is clear that "all branches of government" includes the courts and the municipalities like townships. All of these governmental bodies are obligated to fulfill their responsibilities as trustees of Pennsylvania's natural resources. In fact,

---

<sup>1</sup> The Supreme Court Ruling can be downloaded at: <http://bit.ly/2sPyPij>



townships are charged with protecting the health and welfare of the people in the municipality in the Township Code section 607 (1) of Second Class Township Code:<sup>2</sup>

Section 607. Duties of Supervisors.--The board of supervisors shall:

(1) Be charged with the general governance of the township and the execution of legislative, executive and administrative powers in order to ensure sound fiscal management and to secure the health, safety and welfare of the citizens of the township.

14. In order to fulfill the requirements of the Township code the Supervisors have to—as it says in the Robinson decision, perform "anticipatory protection of the environment for the benefit of current and future generations."

15. The soundness of the Commonwealth's acceptance of the ERA becomes evident when one considers both the potential environmental impacts and the potential health effects of oil and gas development (see below about health impacts). For instance, in the context of this case, does Ms. Lawson, as a resident of Pennsylvania who has a constitutionally protected right to clean air and pure water, have a right to have brine spreading stopped because it causes contamination of the air and water she uses? Does the Department of Environmental Protection as a trustee (either individually or jointly with a township where she lives and/or the township from which the brine originated) have a trust obligation to protect her from a loss of clean air or a loss of pure water? Do DEP and /or other regulatory agencies have the duty to reject permit

---

<sup>2</sup> Second Class Township Code (as a download) is here: [www.psats.org/ckfinder/userfiles/files/Township%20Code%201-24-14.doc](http://www.psats.org/ckfinder/userfiles/files/Township%20Code%201-24-14.doc)



applications if the activity to be permitted would contaminate the air or water or compromise other trust resources? Do they even have the right to give these permits? It has become more and more evident that even the most stringent regulation of oil and gas production will not totally prevent the occurrence of adverse health effects. Don't the trustee responsibilities extend to protecting all Pennsylvanians as precautionary measures?

16. The potential environmental and health effects of natural gas drilling are serious and varied. In particular, there are concerns about the environmental impacts on air and on water resources, both quantity and quality, and on habitat. Natural gas drilling and fracking processes require water resources in the millions of gallons; they may introduce large volumes of chemically contaminated water and additives such as friction reducers, biocides, surfactants, scale inhibitors, and hydrochloric acid into the well; and they may also disturb, distribute, and bring to the surface chemicals from various rock formations, including Naturally Occurring Radioactive Materials (NORM) and Technically Enhanced Naturally Occurring Radioactive Material (TENORM). Coming back to the surface are chemicals including benzene, toluene, ethylbenzene and xylenes (BTEX), formaldehyde, polyacrylamides, chromates, diesel fuels, and metals are used in the fracking fluids, drilling muds or are released through diesel exhaust, venting or flaring. It is estimated that 20%-50% of the fracking fluids and the chemicals they contain can remain underground, but the



remainder come back up with other materials from the formation and other geologic layers as waste.

1. As reported by Hayes in 2009;

"The toxic nature of these waste materials has been well described, despite laws protecting the proprietary nature of the fracking fluids. Produced waters commonly exhibit highly elevated concentrations of bromide, chloride, hardness as calcium carbonate, total dissolved solids, barium, boron, calcium, iron, lithium, magnesium, manganese, potassium, sodium, and strontium. Furthermore, these fluids sometimes also include many additional chemicals including, but not limited to the following: pyridine, ethylbenzene; benzene; toluene; xylenes; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene, arsenic; assorted phthalates; assorted metals; fluorene; phenol; 2-propanol; butyl alcohol; propylene glycol; ethanol; phenanthrene and other chemical compounds." Other drilling mud and fluid contaminants of note include aluminum, titanium, 2-butanone, and 1,2,4-trimethylbenzene."<sup>3</sup>

2. Oil and gas drilling impacts in western and southern United States, and in western Pennsylvania, have been documented by both interest groups and the news media. Concerns about drilling and related activities is heightened as gas drilling operations are exempt from major provisions of seven protective federal laws<sup>4</sup> including provisions of the federal Clean Air Act, Clean Water Act, RCRA (Resource Conservation and Recovery Act) and Safe Drinking Water Act that regulate underground injection of chemicals. *See, TDEX, Crosby 25-3 Well-*

---

<sup>3</sup> See, for example, Hayes, 2009: Sampling and Analysis of Water Streams Associated with the Development of Marcellus Shale Gas, accessed online 3/30/2018 at <https://www.scribd.com/document/111953961/Sampling-and-Analysis-of-Water-Streams>

AND

Hansen Services analysis for Whirley Drink Works in Warren County in Appendix

<sup>4</sup> [https://earthworks.org/cms/assets/uploads/archive/files/publications/FS\\_LoopHolesForPollutersNEW.pdf](https://earthworks.org/cms/assets/uploads/archive/files/publications/FS_LoopHolesForPollutersNEW.pdf)



Windsor Energy, Park County Wyoming, Analysis of Products Used for Drilling, February 25, 2008; Earthworks, Oil and Gas Pollution Fact Sheet, <http://tiny.cc/cdgfJ>; Peter Gorman, An aquifer is at risk – along with property values, livestock, and dreams – after gas wells move in, Fort Worth Weekly, April 30, 2008, at <http://tiny.cc/p2zg2> (Last visited July 8, 2008); Alexandra Fuller, Recovering from Wyoming's Energy Bender, The New York Times, April 20, 2008, at <http://tiny.cc/E004b> (last visited July 7, 2008).<sup>5</sup>

3. In terms of the exemptions, the Bentsen Amendment to the RCRA law<sup>6</sup> is very important. The Bentsen Amendment requires that oil and gas wastes are regarded as 'special' and not regulated as the hazardous wastes that they are, containing toxic materials, because their name was changed to "special".as a result of this amendment. Disposal methods for oil and gas "special" wastes may include road and land spreading in Pennsylvania. These disposal methods can be used without having to verify what is in the materials being spread and whether or not

<sup>5</sup> <http://www.delawareriverkeeper.org/sites/default/files/DRN%20Comment%20on%20DBRC%20Draft%20Regulations%20w%20Attachments%20%282018-03-30%29.pdf>

<sup>6</sup> see the history of how the oil and gas liquid wastes were made "special" and therefore not subject to the supervision that would be required if they are understood to be the hazardous materials that they actually are here: [https://yosemite.epa.gov/oasweb\\_docket.nsf/Attachments%20By%20ParentEillingId/945EF425FA4A9B4F65257E2800480C65/\\$FILE/28%20-%20RCRA%20E%28P%20Exemption.pdf](https://yosemite.epa.gov/oasweb_docket.nsf/Attachments%20By%20ParentEillingId/945EF425FA4A9B4F65257E2800480C65/$FILE/28%20-%20RCRA%20E%28P%20Exemption.pdf)  
"In December 1978, EPA proposed hazardous waste management standards that included reduced requirements for several types of large volume wastes. Generally, EPA believed these large volume "special wastes" are lower in toxicity than other wastes being regulated as hazardous waste under RCRA. Subsequently, Congress exempted these wastes from the RCRA Subtitle C hazardous waste regulations pending a study and regulatory determination by EPA. In 1988, EPA issued a regulatory determination stating that control of E&P wastes under RCRA Subtitle C regulations is not warranted. Hence, E&P wastes have remained exempt from Subtitle C regulations."





the materials are actually harmful.<sup>7</sup> Release of known toxic materials into the environment, even if called 'special,' is still doing damage to people's health, contaminating air and water and is in violation of the PA Environmental Rights Amendment.

4. True, epidemiological proof of causation is a difficult task, but if each time the wastes are put on the road without fail, in minutes, Ms. Lawson is reacting, then a cause and effect relationship cannot be denied. Ms. Lawson has learned from her neighbors and the Amish people in the area that there are many cancers in the area. Her doctor has told her that there is much more asthma and breathing problems than he had ever seen before.<sup>8</sup>

5. We incorporate in this brief all of what is in Paul Rubin's expert report submitted by counsel for Ms. Lawson. Rubin points out among other items that the liquids being disposed of on the roads have known and unknown environment and health consequences. Although Pennsylvania DEP allows and permits 'conventional' brine (and CWT liquids) to be spread on dirt roads, it prohibits Marcellus derived or unconventional brine for the same activity. In the chart on page 15 in Ruben's report the measured components are compared and show that conventional drilling waste can have higher values than unconventional waste so that waste is not less harmful but is still being allowed. Other sources also note the

---

<sup>7</sup> See The Endocrine Disruption Exchange spreadsheet with links to peer reviewed papers linked within the spreadsheets describing impacts here: <https://endocrinedisruption.org/audio-and-video/chemical-health-effects-spreadsheets>

AND in the Compendium: -view or download here: <http://concernedhealthny.org/compendium/>

<sup>8</sup> from telephone conversations with Ms. Lawson



similarity of Marcellus (unconventional) and conventional drilling wastes, for example on page 4 to 5 of Tom Myers, hydrogeologist, expert report<sup>9</sup> he says:

"It is common in the United States to dispose of O&G produced brine by spreading it on roads for dust or ice control. No jurisdictions in Canada allow the spreading of O&G wastewater on roads (Goss et al 2015). The popular press describes the use and unpopularity of the process in northern and western Pennsylvania (for example <http://www.newsweek.com/oil-and-gas-wastewater-used-de-ice-roads-new-york-and-pennsylvania-little-310684> ). However, Pennsylvania does not currently allow the use of brine from unconventional shale deposits for road spreading (PDEP 2017), it does allow brine from conventional deposits. Dr. Avner Vengosh was quoted in the Newsweek article cited above as stating there is not much difference because it is the brine chemicals, salt, ammonium, naturally occurring source of radioactive materials (NORM), and others, that make the brine deleterious to shallow groundwater, not the organic fracking fluid chemicals. Brown (2014) also noted the high levels of NORM, which can be technologically concentrated in brine.

Skalak et al (2014) examined sediments around a series of sites that had received road-spread brine. They found that concentrations in the sediments had increases of radium, strontium, calcium, and sodium of 1.2, 3.0, 5.3 and 6.2 times, respectively, as compared to background concentrations that did not have road spreading of brine. The authors also found a variability of up to 30 times, meaning that some areas could receive concentrated runoff. The concentrations could be limited due to surface runoff dissolving the cations or infiltration flushing it to shallow groundwater. These results indicate that road spreading of O&G brine can contaminate soils and that those soils can be a source of contamination to shallow groundwater and surface water."

---

<sup>9</sup> (pg 149-150 of DRN pdf) <http://www.delawariverkeeper.org/sites/default/files/DRN%20Comment%20on%20DRBC%20Draft%20Regulations%20w%20Attachments%20-%282018-03-30%29.pdf>

6. Also the dust coming off the road likely will carry all the contaminants with the dust from the brine causing what would be a violation of the Clean Air Act if not for the exemptions, but looking at the potential sullyng of the air it is a violation of the ERA. See the picture on page 2 of the PennState Dirt and Gravel pdf for an illustration of road dust raised by a vehicle (link from paragraph 24 below).

7. The historical nature of the disposal of OGW brine on roads is neither science based nor thoughtfully in compliance with the ERA—it is however a cost saving measure used by oil and gas producers as verified by the Pennsylvania Grade Crude Oil Coalition (PGCC) in their brief attempting intervention in this case<sup>10</sup>. By allowing, permitting, the disposal of liquid waste from gas and oil wells the permit is a license to pollute. There is no scientific basis for the practice but as the PGCC said in their request to intervene, that the waste disposal method called brine spreading or 'roadspreading' is necessary to their bottom line and that their bottom line supersedes the interests of the general public. In paragraphs 23, 24, and 25 of their brief, they say:

"23. If the Board were to find in *favor* of Appellant, the roadspreading approval process could be invalidated, which would eliminate a significant method of brine management for PGCC members.

24. If the Board's determination results in revision of the standard conditions in Plan Approvals, it could increase the cost of roadspreading and potentially eliminate roadspreading as a cost effective option for PGCC members.

---

<sup>10</sup> <http://ehb.courtapps.com/efile/documentViewer.php?documentID=38613>

Apr.22.2018 11:27 PM

PAGE 201





25. Accordingly, because PGCC's members have a direct interest in the ability to continue providing brine for roadspreading and that right could be eliminated as a result of this appeal, PGCC's interest is greater than that of the general public.

With those statements we have that:

- the oil gas industry's admission that the practice impacts the public interest and - that the PGCC' financial interests are more important than the people or communities and the land or the future health of the environment - so the Environmental Rights Amendment means nothing to them.

8. Going back to the health impacts, the road dust particles are respirable size particles, PM<sub>10</sub> and smaller. They are highly bio-active as they can be breathed deeply into the lungs. Penn State, Center for Dirt and Gravel Road Studies did some measurements for dust coming off an unpaved road surface that contains clay<sup>11</sup> and found considerable respirable dust generated from a vehicle.

They looked at what they called the PROBLEM:

"The generation, transport, and fate of airborne particulates generated from unpaved road is an area of growing interest and concern across Pennsylvania and the US. The loss of road fines to dust can have negative impacts to road longevity, the surrounding environment, and human health. Within Pennsylvania there are over 20,000 miles of public unpaved roads and approximately 1/3 of the road miles fall within 150 feet of a stream. Due to the close proximity of unpaved roads to streams, there exists the potential for road dust to impact water quality. "

9. Human health is mentioned as it should be, since all of what they measured (Particulate Matter (PM) and the numbers are the micro-gram ( $\mu\text{m}$ ) size) PM<sub>1</sub>, PM<sub>2.5</sub> and respirable PM<sub>10</sub> have health impacts.<sup>12</sup>

<sup>11</sup> [https://www.dirtandgravel.psu.edu/sites/default/files/General%20Resources/Technical%20Bulletins/1B\\_Dust\\_Monitoring.pdf](https://www.dirtandgravel.psu.edu/sites/default/files/General%20Resources/Technical%20Bulletins/1B_Dust_Monitoring.pdf)

<sup>12</sup> from Pollard in 2016 - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5110587/>  
*Environ Sci Pollut Res Int.* 2016; 23(23): 23892-23901.  
Published online 2016 Sep 15. doi: [10.1007/s11356-016-7605-1](https://doi.org/10.1007/s11356-016-7605-1)



"Recent study suggests that 50 % of particles less than 4  $\mu\text{m}$  in diameter penetrate into the lower respiratory tract in children (Brown et al. 2013). Other studies proved that particles with diameters equal or smaller than 2.5  $\mu\text{m}$  (PM2.5) reach the alveoli and up to 50 % of them may remain in the lung tissue (Valavanidis et al. 2008). Fine PM can penetrate deep into the airways and induce alveolar inflammation, which is responsible for release of mediators favoring acute episodes of respiratory diseases (Schwartz 1992). Due to deep deposition they are removed very slowly, increasing the chances of causing cell damage"

10. To summarize there is dust coming off unpaved dirt roads that have clay in the roadbed. This dust is small particles that are respirable—able to be carried deep into the lungs where they can cause cell damage. Further these small particulate dusts can carry contaminants with them. Though not a well studied area, especially in relation to rural settings, there has been some work done looking at metal contamination carried with road dusts in an urban setting. For instance, from the abstract of Heavy Metal Contamination of Road Dust at the Downtown Area in the Metropolitan City of Ulsan, Korea, <https://ieeexplore.ieee.org/document/4107361/>

Road dust often contains elevated concentrations of heavy metals and can influence on human health.

and

The results indicate that the road dust in the study area has elevated concentrations of Cd, Cu, Pb, Zn, and Ni and the concentrations of heavy metals increased with the decrease of particle size.

11. The small particulate matter dusts will likely carry with them the burden of materials in the OGW brine being disposed of on the roads making these dusts particularly dangerous.



12. The OGW brine is being spread on dirt roads with the justification that it is a dust control, but actually it is adding to the dust. In the attached Appendix item, Affidavit from Siri Lawson, the introduction contains calculations revealing that a 3.000 gallon spreader truck could be adding 1 1/4 ton of very small particle size material to the road.

13. The OGW brine has a high salt content (see pg 15 chart in Rubin) which is mostly sodium chloride with some chlorides of calcium and magnesium (and some other metals). The observed tendency of the clay road surface is to become slippery mud and then harden quickly keeping the shapes of the ruts created by passing traffic. This dramatically hardened surface, with the ruts still in place then shatters into dust with additional traffic increasing the dust problems the OGW brine spreading was supposed to cure. It is the high salt content that causes this behavior as has been looked at in peer reviewed papers, such as that by Jonsson and Labbez<sup>13</sup>

"At low salt, the interaction is strongly repulsive and the dispersion should appear as a solid ("repulsive gel"). With increasing salt concentration, the repulsion is weakened and a liquid phase appears ("sol"). A further increase of the salt content leads a second solid phase ("attractive gel") governed by attractive interactions between the platelets. Finally, at sufficiently high salinity, the clay precipitates..."

14. Materials and expert reports developed looking at un-conventional and/or Marcellus drilling have justified bearing on the harms created by OGW brine spreading on roads due to two factors

---

<sup>13</sup> <https://www.ncbi.nlm.nih.gov/pubmed/18800854>



1- the above mentioned comparison (in Rubin's report) of conventional and unconventional measured components of liquid wastes showing conventional wastes with higher contaminant values than average Marcellus values.

and

2- that over 2/3 of all existing gas wells were fracked,<sup>14</sup> and over 1/2 of all existing oil wells were fracked<sup>15</sup> Plus "up to 95% of all new wells" since 2013 are fracked<sup>16</sup>

Therefore, according to the EIA, and DOE, almost all new gas and oil wells today are fracked. and we can use what we know of the substances contained in fracking fluids, materials released from fracked wells and toxicity data from fracked wells and wastes when talking about gas oil well 'brine' (OGW brine).

15. Concerned Health Professionals of New York's Compendium, 5th Edition<sup>17</sup> yields some important documented information on OGW wastes or what are being called "brine" and spread or disposed of on roads:

on pg 14 - Once in production, a fracked well continues to generate liquid throughout its lifetime. This produced water, which contains many of the same toxic substances as flowback fluid, is a second component of fracking waste, and it also requires containment and disposal.

---

<sup>14</sup> federal Energy Information Agency (EIA) and federal Department of Energy (DOE)<https://www.eia.gov/todayinenergy/detail.php?id=26112>

<sup>15</sup> <https://www.eia.gov/todayinenergy/detail.php?id=25372>

<sup>16</sup> - US Dept. of Energy, [How is shale gas produced?](https://energy.gov/sites/prod/files/2013/04/f0/how_is_shale_gas_produced.pdf), Apr. 2013 [https://energy.gov/sites/prod/files/2013/04/f0/how\\_is\\_shale\\_gas\\_produced.pdf](https://energy.gov/sites/prod/files/2013/04/f0/how_is_shale_gas_produced.pdf)

<sup>17</sup> Concerned Health Professionals of New York & Physicians for Social Responsibility. (2018, March). Compendium of scientific, medical, and media findings demonstrating risks and harms of fracking (unconventional gas and oil extraction) (5th ed.). <http://concernedhealthny.org/compendium/>





on pg 15 - All of that two billion daily gallons of [wastewater] fluid is toxic, on pg 17 - Studies reveal inherent problems in the natural gas extraction process, such as well integrity failures caused by aging or the pressures of fracking itself, and in the waste disposal process. These issues can lead to water contamination, air pollution with carcinogens and other toxic chemicals, earthquakes, and a range of environmental and other stressors inflicted on communities.

on pg 23 - University of Iowa researchers documented a variety of radioactive substances including radium, thorium, and uranium in fracking wastewater and determined that their radioactivity increased over time; they warned that radioactive decay products can potentially contaminate recreational, agricultural, and residential areas.

on pg 27 - wells with longer lateral pipelines to access more gas or oil per well, generating more waste even as the pace of drilling slowed. (See footnote 188.) Indeed, according to data provided to investors, the average amount of water used to frack a single well has more than doubled between 2013 and 2016 due to longer laterals and more intensive fracking.

on pg 51 - July 12, 2017 – In western Pennsylvania, a team of researchers looked at sediments in the Conemaugh River watershed downstream of a treatment plant that was specially designed to treat fracking wastewater. The researchers found contamination for many miles downstream with fracking-related chemicals that included radium, barium, strontium, and chloride, as well as endocrine-disrupting and carcinogenic compounds. The peak concentrations were found in sediment layers that had been deposited during the years of peak fracking wastewater discharge. Elevated concentrations of radium were detected as far as 12 miles downstream of the treatment plant and were up to 200 times greater than background. Some stream sediment samples were so radioactive that they approached levels that would, in some U.S. states, classify them as radioactive waste and necessitate special disposal.<sup>146, 147</sup>

<sup>146</sup> Burgos, W. D., Castillo-Meza, L., Tasker, T. L., Geeza, T. J., Drohan, P. J., Liu, X., ... Warner, N. R. (2017). Watershed-scale impacts from surface water disposal of oil and gas wastewater in Western Pennsylvania. *Environmental Science & Technology*, 51(15), 8851–8860. doi: 10.1021/acs.est.7b01696

<sup>147</sup> Johnston, I., (2017, July 12). Fracking can contaminate rivers and lakes with radioactive material, study finds. *The Independent*. Retrieved from <http://www.independent.co.uk/news/science/fracking-dangers-environment-water-damage-radiation-contamination-study-risks-a7837991.html>

on pg 254 - September 15, 2016 – A systematic review of 45 studies,



primarily but not exclusively addressing conventional oil and gas activities, showed an emerging body of evidence documenting harm to reproductive health from residential and occupational exposure to these operations. The strongest evidence existed for increased risk of miscarriage, prostate cancer, birth defects, and decreased semen quality. Authors state that there is “ample evidence for disruption of the estrogen, androgen, and progesterone receptors with individual chemicals and waste products related to oil and gas extraction,” and “impacts from unconventional oil and gas activities will likely be greater, given that unconventional activities have many similarities to conventional ones and employ dozens of endocrine-disrupting chemicals in the process of hydraulic fracturing.”<sup>1075</sup>

16. Besides the extensive contents and references in the Concerned Health Professionals of New York's Compendium<sup>18, 19</sup>, the Rubin report and other sources,<sup>20</sup> there is even more new reliable information about the dangers of disposing of OGW brine (produced water from drilling or from CWT plants) into the environment by 'brine spreading' on dirt roads. The recent March 5, 2018 paper by M.A. Chen and B.D. Kocar<sup>21</sup> shows for instance, that: there is a strong likelihood that radioactive radium can adhere to particles of clay from the road - meaning that the road dust will carry a radium burden from the clay road material and the OGW brine disposed of onto these roads, when dust comes off the road. People and animals breath that dust with the highly bio-active radium carried in with the clay particles.. The Chen-Kocar paper describes bonding of radium to particles of a type of clay they looked

<sup>18</sup>view or download here: <http://concernedhealthny.org/compendium/>

<sup>19</sup> [http://concernedhealthny.org/wp-content/uploads/2018/03/Fracking\\_Science\\_Compendium\\_5FINAL.pdf](http://concernedhealthny.org/wp-content/uploads/2018/03/Fracking_Science_Compendium_5FINAL.pdf)

<sup>20</sup> (see starting on page 81 about oil gas liquid wastes) <http://www.delawareriverkeeper.org/sites/default/files/DRN%20Comment%20on%20DRBC%20Draft%20Regulations%20w%20Attachments%20%282018-03-30%29.pdf>

<sup>21</sup> <https://pubs.acs.org/doi/pdfplus/10.1021/acs.est.7b05443>



at, Montmorillonite. Dirt roads are usually primarily clay and the clays in PA are largely mixed illite and Montmorillonite, the studied clay.

17. Also the endocrine disrupting materials in the OGW brines, which are not looked for or quantitatively tested for, are still harmful. See <https://endocrinedisruption.org/enews/exploring-endocrine-disrupting-air-pollutants-near-unconventional-oil-and-gas-sites> and specifically <https://endocrinedisruption.org/audio-and-video/oil-and-gas/webinar-bolden>. As explained in those two links and in the paper, Does the Dose Make the Poison,<sup>22</sup> that very small quantities of minerals, organic and inorganic compounds can act as hormones causing biological disruption of processes in the body necessary for health and for life itself.

18. The wastes being put into the environment by OGW brine spreading contain many injurious materials to the extent that they are not compatible with the provisions of the Environmental Rights Amendment, which all branches of Pennsylvania government have a trustee obligation to honor.

## CONCLUSION

For the foregoing reasons the Board should grant the Appellant's motion for summary judgement.

Respectfully submitted,

/s/ John J. Zimmerman

John J. Zimmerman  
Zimmerman & Associates

---

<sup>22</sup> <http://www.ourstolenfuture.com/News/science/lowdose/2007/2007-04-30%20Does%20the%20Dose%20Make%20the%20Poison.pdf>



13508 Maidstone Lane  
Potomac, MD 20854  
(240) 912-6685 (office)  
[zimmermanjj@verizon.net](mailto:zimmermanjj@verizon.net)

following is

**APPENDIX**

containing two items

**Hansen Services Analysis  
of OGW brine to be spread on the Whirley Drink Works property**

and

**Affidavit from Ms. Siri Lawson with introduction**



Feb. 04. 2018 07:50 AM

PAGE. 1 / 9



OG/Brinespreading/Hansen Services

April 6, 2016

Justin Hanson DBA Hansen Svcs.  
7 Mead Blvd.  
Clarendon, PA 16313

OAR of 3  
licensed to spread in  
Farmington

Re: 2016 Brine Spreading Plan Review  
Approval No. NW5916  
Whirley Drink Works, City of Warren,  
Sam Harvey Property, Sugargrove Township, Warren County

Dear Operator:

The Department of Environmental Protection (DEP) has reviewed your plan for spreading brine for dust control on the above subject roads/lots. This plan for applying oil and gas well production brine to roads for dust control is approved subject to operating requirements listed below.

This Plan Approval is granted on a calendar year basis and expires on December 31, 2016.

**Operating Requirements**

1. The application of brine to unpaved roads must be performed in accordance with the approved plan.
2. The brine may only be applied at a rate and frequency necessary to suppress dust and stabilize the road. The rate and frequency of application must be controlled to prevent the brine from flowing or running off into roadside ditches, streams, creeks, lakes and other bodies of water or infiltrating to groundwater.
3. Recommended spreading rates: The road should initially be spread at a rate of up to one-half gallon per square yard (typically after the road has been graded in the spring). The road should subsequently be spread at a rate of up to one-third gallon per square yard no more than once per month unless-based on weather conditions, traffic volume or brine characteristics-a greater frequency is needed to control dust and stabilize the road. The application rate for race tracks and mining haul roads should be determined for each site and should not exceed one gallon per square yard.
4. Only production or treated brines may be used. The use of brine from Marcellus and other non-conventional shale formations is not applicable for roadspreading. The use of drilling, fracing, or plugging fluids or production brines mixed with well servicing or treatment fluids, except surfactants, is prohibited. Free oil must be separated from the brine before spreading.
5. Brine must not be applied within 150 feet of a stream, creek, lake or other body of water.
6. Brine must be spread by use of a spreader bar with shut-off controls in the cab of the truck.
7. Brine must not be placed on sections of road having a grade exceeding 10 percent.
8. Brine must not be spread on wet roads, during rain, or when rain is imminent.
9. Each vehicle used to spread brine shall have a clearly legible sign identifying the applicator on both sides of the vehicle.



- 10. The company spreading the brine shall notify the appropriate regional Oil & Gas program, brine spreading coordinator the business day before spreading brine.
- 11. The producing oil and gas wells must be in compliance with the bonding requirements of the Oil and Gas Act.
- 12. The person who received approval for the roadspreading plan must submit a monthly report (5500-FM-OG0046) to DEP indicating the location and amount of brine spread during the month. This monthly report must be submitted by the 15th day following the month in which the brine was spread. This report must be submitted even if no spreading took place during that month. The monthly report shall be submitted to:  
 PA DEP NWRO  
 District Oil & Gas Operations  
 230 Chestnut St.  
 Meadville PA 16335
- 13. Any revisions to the plan must be submitted to DEP for approval. Approval must be obtained prior to implementation of the revisions.
- 14. Failure to comply with all these conditions may result in DEP rescinding the plan approval.

**Reporting Requirements**

Transporters of residual waste must follow the requirements of 25 Pa. Code §299 Subchapter B (Standards for Collecting and Transporting of Residual Waste). Transporters must keep a daily operations record and file an annual operational report with DEP by March of the following year.

Oil and gas operators who generate brine must report the amount in their Annual Production Report.

This plan approval letter and its conditions should be reviewed by all parties involved in the brine spreading activity. A copy should be maintained in the cab of each vehicle used for spreading and its conditions made known to each driver.

If you have any questions, please contact me at 814.332.6173.

Sincerely,

Curtis LoSuer  
Environmental Protection Specialist  
Oil and Gas Management

cc: Rick Mader, WQS  
Marshall Wurst, OGI  
File



# Analytical Services, Inc.

P.O. Box 237  
Brookway, PA 10024-0237

Laboratory (814) 265-8749  
FAX (814) 265-8740

## GENERAL CHEMICAL ANALYSIS REPORT

CUSTOMER: Hansen Services  
7 Mead Boulevard  
Clarendon, PA 16813  
Attn: Justin Hansen

Page 1 of 8

SAMPLE DATE: 01/07/16 at 12:50 pm  
RECEIPT DATE: 01/07/16 at 6:40 pm

REPORT DATE: 02/10/16  
ARI ID#: 140807

DESCRIPTION OF SAMPLE: Hansen Services

### TOTAL ANALYSIS RESULTS:

PARAMETER	RESULT	UNIT	QUANTITATION LIMIT	METHOD	BY	DATE & TIME	DATA QUALITY
TPH-HEM Oil & Grease	5	mg/L	5	SM 8102B	WB	01/07/16 @ 11:00 pm	M2
TPH-GRO	6,148	ppm	-	EPA 8015D	FL	01/04/16 @ 1:21 pm	2A
TPH-GRO	6,148	ppm	-	EPA 8015D	FL	02/04/16 @ 9:10 am	2A
Ammonia-N	< 0.0	mg/L	0.0	EPA 8007	BD	01/18/16 @ 7:47 pm	
Nitrite-N	< 0.0	mg/L	0.0	EPA 8007	BD	01/18/16 @ 7:47 pm	
Nitrate-N	781	mg/L	5	EPA 8007	BD	01/18/16 @ 7:47 pm	21
Fluoride	< 0.0	mg/L	0.1	SM 4650 P-C	OC	02/09/16 @ 11:18 am	
Ortho Phosphate	< 0.1	mg/L	0.1	EPA 8007	BD	01/18/16 @ 7:47 pm	
Dissolved Phosphorus	< 0.1	mg/L	0.1	SM 4650 P-C, A-C	WD	02/10/16 @ 10:50 am	
Dissolved Vanadium	< 0.000	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Zinc	< 0.000	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Titanium	< 0.000	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Strontium	< 0.1	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Tl	< 0.000	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Barium	< 0.000	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Antimony	< 0.000	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Lead	< 0.000	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Cadmium	< 0.000	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Selenium	< 0.000	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Manganese	< 0.000	mg/L	0.000	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Nitrate-N	6.40	mg/L	0.500	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Magnesium	1,770	mg/L	200	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Lithium	< 0.1	mg/L	-	SM 8111D	OC	02/04/16 @ 4:48 pm	
Dissolved Potassium	28.8	mg/L	10.0	SM 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Iron	86.8	mg/L	10.0	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Copper	0.703	mg/L	0.0	EPA 8007	CH	02/04/16 @ 4:48 pm	
Dissolved Chromium	< 0.000	mg/L	0.0	EPA 8007	CH	02/04/16 @ 4:48 pm	

1. In the duplicate due to insufficient sample volume.  
2. In the duplicate sample result exceeded the collection range and high OCV, but is within the Linear Collection Range. Concentration is considered an estimate.  
3. In the duplicate was received within the EPA retention/hold time.

*Handwritten notes:*  
The sample was collected at 11:00 pm on 01/07/16 by Justin Hansen.  
The sample was received at the lab on 01/07/16 at 12:50 pm.  
The sample was analyzed on 02/10/16 at 10:50 am.



# Analytical Services, Inc.

P.O. Box 237  
Brockway, PA 16824-0237

Laboratory (814) 265-0749  
FAX (814) 265-8749

## GENERAL CHEMICAL ANALYSIS REPORT

CUSTOMER: Hansen Services  
7 Mead Boulevard  
Clarks Summit, PA 16813  
Attn: Justin Hansen

Page 2 of 5

SAMPLE DATE: 01/07/18 at 12:50 pm  
RECEIPT DATE: 01/07/18 at 8:40 pm

REPORT DATE: 02/10/18  
ABI ID#: 140667

DESCRIPTION OF SAMPLE: Hansen Services

### TOTAL ANALYSIS RESULTS:

PARAMETER	RESULT	UNIT	QUANTITATION LIMIT	METHOD	NY	DATE & TIME	DATA QUALITY
Dissolved Solids	49.840	mg/L	5	811 4820	CH	02/03/18 @ 4:45 pm	
Dissolved Oxygen	40.100	mg/L	50.0	BPA 350.0	CH	02/03/18 @ 4:10 pm	
Dissolved Chloride	40.100	mg/L	50.0	BPA 300.0	CH	02/03/18 @ 4:58 pm	
Dissolved Barium	1.47	mg/L	5	BPA 200.0	CH	02/03/18 @ 4:48 pm	
Dissolved Boron	2.97	mg/L	.15	GM 4500 P-D	CH	02/04/18 @ 12:00 pm	
Dissolved Arsenic	0.640	mg/L	0.1	BPA 800.0	CH	02/04/18 @ 6:45 pm	
Dissolved Aluminum	0.813	mg/L	0.100	BPA 200.0	CH	02/03/18 @ 4:48 pm	
Total Inorganic Carbon	21.8	mg/L	0.8	SM 82100	WB	02/09/18	
TDC	211.5	mg/L	0.5	SM 82100	WB	02/09/18	
Hardness	87.090	mg/L	3000	SM 19400	CH	02/04/18 @ 4:58 pm	
Alkalinity (as CaCO3)	38	mg/L	1	SM 22500	PHY	01/12/18 @ 12:00 pm	
Bromine	1.31	mg/L	0.100	BPA 260.0	CH	02/03/18 @ 4:10 pm	
Iron	81.890	mg/L	10	GM 24800	PHY	01/17/18 @ 8:48 am	
Manganese	0.38	mg/L	0.05	BPA 300.0	CH	02/04/18 @ 1:00 pm	
Nickel	0.187	mg/L	5	BPA 600.0	WB	02/03/18 @ 7:47 pm	
Nitrate	1.270	mg/L	500	BPA 200.0	CH	02/04/18 @ 1:00 pm	
Oil	118	mg/L	10.0	BPA 250.0	CH	02/04/18 @ 6:50 pm	
Sulfate	24.100	mg/L	500	BPA 200.0	CH	02/04/18 @ 1:00 pm	
Conductivity	140.100	mg/L	0.1	SM 80 100	WB	01/09/18 @ 1:00 pm	
Specific Gravity	1.000	mg/L	--	--	WB	01/09/18	
pH @ 25	3.6	mg/L	0.05	SM 4500 B-D	WB	02/03/18 @ 10:00 am	
Temperature	3.6	°C	--	SM 24600	WD	01/07/18 @ 8:40 pm	
Dissolved Oxygen	1.70	mg/L	--	SM 4500 O-G	WD	01/07/18 @ 8:40 pm	
Density	1.000	B.O	--	--	WD	01/07/18 @ 8:40 pm	
Oil (Total)	0.85	--	--	SM 1500 M+M	WD	01/07/18 @ 8:40 pm	





### Analytical Services, Inc.

P.O. Box 237  
Brookway, PA 15824-0237

Laboratory (814) 265-8749  
FAX (814) 265-8749

#### GENERAL CHEMICAL ANALYSIS REPORT

CUSTOMER: Hansen Services  
7 Mead Boulevard  
Clarendon, PA 16813  
Attn: Justin Hansen

Page 3 of 8

SAMPLE DATE: 01/07/16 at 12:00 pm  
RECEIPT DATE: 01/07/16 at 8:43 pm

REPORT DATE: 02/10/16  
ADJ ID#: 140887

DESCRIPTION OF SAMPLE: Hansen Services

#### TOTAL ANALYSIS RESULTS:

PARAMETER	RESULT	UNIT	QUANTITATION LIMIT	METHOD	DT	DATE APPROV
Iron (ppm)	YBR	--		Hal	HR	01/07/16, 01/07/16

We certify that the above reported values were obtained by use of procedures appropriate for the sample as submitted.

By: William J. Babatoue Date: 02/10/16

For: William J. Babatoue, Chief Chemical Analyst

PAUSE LAG ID#: 33-00411



### Analytical Services, Inc.

P.O. Box 237  
Brookway, PA 15864-0237

Laboratory (814) 285-8749  
FAX (814) 285-8749

### CHEMICAL ANALYSIS REPORT

CUSTOMER: Hansen Services  
7 Moad Blvd.  
Clarendon, PA 18313

ABI ID#: 140687  
SAMPLE DATE: 01/07/10 @ 12:50  
RECEIVED: 01/07/10 @ 17:40  
REPORTED: 02/09/10

ATTN: Justin Hansen

#### SAMPLE DESCRIPTION:

#### TOTAL ANALYSIS RESULTS:

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Time	Qualifier
1,3,5-trimethylbenzene	60.3	µg/L	10.0	SW 846-8260B	02/02/10	23:27	3a
1,2,4-trimethylbenzene	139	µg/L	10.0	SW 846-8260B	02/02/10	23:27	3a
Unsat'd	2090	µg/L	25.0	SW 846-8260B	02/02/10	17:00	3a
Toluene	1870	µg/L	25.0	SW 846-8260B	02/02/10	17:00	3a
Ethylbenzene	90.2	µg/L	10.0	SW 846-8260B	02/02/10	23:27	3a
Xylenes (total)	957	µg/L	20.0	SW 846-8260B	02/02/10	23:27	3a
Isopropylbenzene	< 10.0	µg/L	10.0	SW 846-8260B	02/02/10	23:27	3a
Naphthalene	10.2	µg/L	10.0	SW 846-8260B	02/02/10	23:27	3a
sec-butylbenzene	< 10.0	µg/L	10.0	SW 846-8260B	02/02/10	23:27	3a
tert-butylbenzene	< 10.0	µg/L	10.0	SW 846-8260B	02/02/10	23:27	3a

Sample analyzed by Palmyra Laboratories, PA Lab # 07-062

Qualifier 3a: This sample was received outside the EPA recommended holding time.

We certify that the above reported values were obtained by use of procedures appropriate for the sample as submitted.

Reviewed and Approved By: William Sabatosa  
For: William Sabatosa, Chief Chemical Analyst

PADEP LAB ID#: 33-00411



### Analytical Services, Inc.

P.O. Box 237  
Brookway, PA 15824-0237

Laboratory (814) 285-8748  
FAX (814) 285-8749

### CHEMICAL ANALYSIS REPORT

CUSTOMER: Hansen Services  
7 Moud Blvd.  
Clarendon, PA 16313

ABI ID#: 140057  
SAMPLE DATE: 01/07/18 @ 12:50  
RECEIVED: 01/07/18 @ 17:40  
REPORTED: 02/08/18

ATTN: Justin Hansen

#### SAMPLE DESCRIPTION:

#### TOTAL ANALYSIS RESULTS:

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Time	Qualifier
Pyridine	< 40.0	µg/L	40.0	SW 846-82700	02/03/18	14:53	3a, 2d
Acetophenone	< 20.0	µg/L	20.0	SW 846-82700	02/03/18	14:53	3a, 2d
3 & 4-methylphenol	124	µg/L	20.0	SW 846-82700	02/03/18	14:53	3a, 2d
Zimethyphenol	101	µg/L	20.0	SW 846-82700	02/03/18	14:53	3a, 2d

Sample analyzed by Fairway Laboratories, PA Lab # 07-062

Qualifier 2a: This sample was received outside the EPA recommended holding time

Qualifier 2d: The LCU spike recovery was outside acceptance limits for the noted analyte. Data accepted based on additional batch QC.

We certify that the above reported values were obtained by use of procedures appropriate for the sample as submitted.

Reviewed and Approved By: William A. Sabatosa  
For: William Sabatosa, Chief Chemical Analyst

PADEP LAB ID#: 33-60411



**AFFIDAVIT FROM MS. SIRI LAWSON WITH INTRODUCTION**

**INTRODUCTION**

1. Ms. Siri Lawson has been a member of Damascus Citizens for Sustainability (DCS) since 2008 when she found us on the internet and has been a colleague, source of key information and contributor ever since.(paragraph 17, Affidavit of Barbara Arrindell) Contributor by virtue of both her contributions to the knowledge base and her financial contributions through the years to DCS; colleague in that we have been able to share and learn from each other about gas and oil industry practices and important health consequences of those practices both on a personal and a community level. Her Affidavit is being included here as one person's suffering from the disposal of oil gas waste brine (OGW brine) allowed/permitted by Pennsylvania with the excuse that it is a dust control method on dirt roads. Many in her and other communities where OGW brine is 'spread' (disposed of) on roads have health impacts. She represents the human face of the impacts from this practice. Animals are also sickened and the environment is harmed..

2. One interesting example that illustrates the collaborative nature of DCS' interactions with Ms. Lawson was our exercise evaluating if high TDS brine would actually add to the road dust as opposed to controlling it. We assumed for argument's sake (and if you see the chart on page 15 of Rubin's report this is reasonable) 100,000 mg/L of Total Dissolved Solids (TDS). As currently conducted in Warren County PA, often involving at least four passes per road per day a 3.000



gallon spreader-truck is dumping 3,000 gallons = 11,356 liters and we have 100,000 mg/liter of TDS or 11,356liters x 100,000 mg/L = 1,135,600,000mg of TDS in the truck This is equal to 2,503 pounds of TDS being dumped along that road - this is equivalent to 1 and 1/4 tons.

3. definition of TDS:

**Total dissolved solids (TDS)** is a measure of the combined content of all inorganic and organic substances contained in a liquid in molecular, ionized or micro-granular (colloidal sol) suspended form and does not include uncharged materials like motor oil, gasoline, VOCs, many pharmaceuticals, and pesticides which do not contribute to a TDS measurement.

4. The dust coming off the dirt road receiving this waste includes the TDS as TDS is molecular or micro-granular size and will become air-borne with the dust. Looking at the Hanson Analysis of material spread at the Whirley Drink Works, there are toxic level contaminants in it that would be in the dust also. Note that this analysis is a very rare item, as Rubin explains, most analyses submitted are very inadequate and not reflective of what is being put on the roads. Besides his cannot be in compliance with the Environmental Rights Amendment.

What follows is Siri Lawson's Affidavit, originally submitted with the DCS request for intervention in EHB Docket No. 2017-051-B. on February 15, 2018.



Jan. 31. 2018 08:26 AM  
To: Siri Lawson Page 3 of 16

2018-01-30 10:15:27 (DM1)

PAGE. 6 / 8  
1412201110/ from: Emily Collins



I, Siri Lawson, do hereby affirm and state that:

1. In 2009 my husband and I moved to our current residence on Lindell Road which is in Farmington Township, Warren County, PA. Lindell Road is an unpaved, dirt road. Most of the roads in Farmington Township and those surrounding Lindell Road are unpaved dirt roads.

2. In 2011, Farmington Township began allowing Lindell Road to be repeatedly spread with oil and gas wastewater (brine). I counted over 30 loads of brine spread on Lindell Road during 2011.

3. My husband and I complained verbally to Farmington Township about the excessive brine spreading. I wrote complaint letters to Farmington Township Board of Supervisors, the PA Department of Environmental Protection and the federal Environmental Protection Agency. The local newspaper ran an article about the brine situation. After each complaint Farmington Township would assure us that Lindell Road would not get brined. The brining was not completely stopped and has continued through 2017.

4. I react acutely to the brine spreading with wheezing, infection and many other symptoms. In 2011, when they began the excessive spreading in earnest, I was diagnosed with life-threatening adrenal insufficiency. I developed such acute gastric reflux that radical surgery was prescribed. I developed abnormal nodules and cysts in my thyroid, liver, breasts, ovaries, lungs and sinus. I developed abnormally high Parathyroid and eosinophil levels.



5. In 2012 the number of loads of brine spread on Lindell Road dropped to seven. In late 2012, my husband, Wayne, had two back to back heart attacks. He was hospitalized for 14 days and received multiple stents. He was asked on the operating table if he had been exposed to chemicals as this was the type of heart attack linked to chemical exposure.

6. By my count, I noted five loads of brine spread on Lindell Road in 2013. In 2014, I counted seven loads of brine spread. In 2015, there were multiple days in July and August when brine was spread on Lindell road. After each load either my husband or myself contacted the Township to complain. There were multiple occasions when I contacted the PA Department of Environmental Protection. I experienced adverse health impacts similar to those described above and below during each brine spreading event.

7. Despite aggressive treatment, my adrenal insufficiency continued to worsen. Persistent angina sent me to a cardiologist. I developed a fibromyalgia-type syndrome, a rib-cracking cough and neuropathy. I had no ability to fight off respiratory infections. Continued exposure to brine worsened these conditions.

8. In 2016, I was treated by doctors from Cleveland Clinic. My exposure to endocrine disrupting chemicals from brine was noted and discussed. Endocrinologists at Cleveland Clinic changed the diagnosis of adrenal insufficiency to adrenal suppression. I was told I had developed iatrogenic Cushing's disease. I had been being treated with high doses of steroids which are



Jan. 31. 2018 06:25 AM  
To: Dan Lawson Page 6 of 13

2018 01 30 16 15:27 (GMT)

PAGE. 4 / 8  
14122911197 From Emily Collins



the standard treatment to control inflammatory and allergic reactions like I exhibited after exposure to each brine event. I had begun reacting to the high steroid doses. **I could no longer use steroids as a safe treatment for environmental exposures, injuries or illness. Steroids can - or will - now kill me.**

9. In August of 2016, after Lindell Rd got brined, I had a violent response. For nearly 10 days, especially when I got near the road, I reacted with excruciating eye, nose and lung burning. My tongue swelled to the point my teeth left indentations. My sinus reacted with a profound overgrowth of polyps, actually preventing nose breathing. In September of 2016 Lindell Road again got brined. Again I violently reacted. The polyps required surgical intervention and in December 2016 I had sinus surgery, skin cancer surgery and a suspected cancerous cervical polyp removed. Earlier in the year, a large cyst in my leg was removed. During this time period, two of my female dogs each had a large polyp-like growth on their external genitalia.

10. In June of 2017, Farmington Township graded and raked Lindell Rd. They left behind inches of loose brine saturated road dirt. That loose brine saturated road dirt caused a tremendous dust issue. Water courses along Lindell turned nauseating colors after run-off events.

11. I reacted to the dust by re-growing the recently surgically removed nasal polyps. I experienced profound whoozing, coughing and subsequent sinus, ear and





Jan. 31. 2018 08:25 AM  
To: Bill Lewson Page 8 of 15

2018-01-30 16:15:27 (GMT)

PAGE. 1 / 3

14722011197 From: Emily Collins



lung infections. My Ear Nose and Throat specialist opined the polyp re-growth combined with my inability to tolerate large doses of steroids left me with no viable options for treatment. In July 2017 Lindell Road got brined once. I reacted as I had in prior brine events. I was in misery.

12. My doctor asked me to join a research project at University of Pennsylvania <sup>UPMC</sup> Medical Center after the dust exposure, I would be tested for ciliary dyskensia. It was found I had developed severe secondary ciliary dyskensia. I am unable to flush mucus or bacteria or viruses out of my system. It was discovered my lungs were nearly opaque. functional only because I still had a strong cough mechanism. My susceptibiliy to infection is overwhelming. My lung doctor has suggested treatment (experimental) with Nucala in a last ditch effort to thin mucus.

13. Brine has dramatically impacted our lives in other ways. Brine has caused our vehicles to rust more quickly than normal, often causing dangerous equipment failure and high maintenance costs.

14. From my personal observations and experiences dirt roads that are brined dry out more quickly after brining and result in even more dust than if the roads had not been brined. Vehicular traffic on these brined dried roads produces clouds of dust. This same dust caused by the over-brined roads penetrates our home and barn. It causes items in the home to prematurely rust, it also collects on surfaces such as fans, house siding, and windows.



Jan. 31. 2018 08:25 AM  
To: John Lawson Page 1 of 15

2018-01-20 10:52:13 AM

PAGE. 2 / 6  
Printed from Emily Louisa



15. Each time the roads are brined, the brine causes the road to become very slick and difficult to travel over. Vast amounts of sticky brine mud coat vehicles and buggies. Add seasonal moisture and the roads fill with ruts and potholes.

16. Because surface water contamination from brining is very visually apparent, I am worried about ground and well water contamination. In our case, we have a water well with multiple filters that need frequent changes. Because of the appearance of the filters, we drink only bottled water.

17. At public meetings in 2016-17, Hydro Transport, LLC, as well as Farmington Township Supervisors repeatedly invited residents to inspect or photograph Hydro Transport while spreading brine. Residents were repeatedly invited to identify whether or not Hydro Transport was using a spreader bar. In 2017, I encountered Hydro Transport twice and took pictures. Hydro Transport, charged me twice with harassment for taking those pictures while he was spreading on a public road.

18. During the Thanksgiving holiday, 2017, my house was broken into. Notes and pictures related to brine spreading, medical records, test results, and research papers, appeared to be the only items taken. A police report was filed.

I declare subject to the penalties of 18 Pa. C.S. § 4904 regarding unsworn falsification to authorities that the foregoing is true and correct to the best of my personal knowledge.

