

**From:** [Frame, Jason R](#)  
**To:** [Pendergrass, Curt \(CHFS DPH\)](#); [Partridge, George \(EEC\)](#)  
**Cc:** [McKinley, Matthew W \(CHS-PH\)](#); [Keffler, Christopher \(CHFS Rad Hlth\)](#)  
**Subject:** RE: TNORM disposal in KY  
**Date:** Monday, February 08, 2016 2:18:49 PM  
**Attachments:** [image011.png](#)  
[image005.png](#)  
[image009.png](#)  
[image011.png](#)  
[image013.png](#)

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I'm not a lawyer by any stretch of the imagination, but during our TENORM disposal discussions the problem of out of state waste has always been at the forefront. Those who know much more about landfill rules than me have always said that if you take in-state waste you have to accept out of state also because of the federal interstate commerce act.

Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program  
Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division  
350 Capitol Street, Room 313  
Charleston, West Virginia 25301  
Office: (304)356-4303  
Fax: (304) 558-0524  
Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



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**From:** Pendergrass, Curt (CHFS DPH) [<mailto:Curt.Pendergrass@ky.gov>]  
**Sent:** Monday, February 08, 2016 1:48 PM  
**To:** Partridge, George (EEC); Frame, Jason R  
**Cc:** McKinley, Matthew W (CHS-PH); Keffler, Christopher (CHFS Rad Hlth)  
**Subject:** RE: TNORM disposal in KY

Hello Jason,

To be honest, I know nothing about the Interstate Commerce Act or who enforces it other than what I just found on Wikipedia. If you and your colleagues in WV have any information on how this transport of TENORM from WV to KY by a private company might be a violation of the ICA, we would love to hear it. We are in the process of paying visits to all the landfills where this material was disposed of here in KY and based on a conversation with one of the landfill operators, Republic Services, I can tell you they had no idea what they were accepting.

Regards,

Curt Pendergrass PhD  
Supervisor, Radioactive Materials Section  
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Website: <http://www.chfs.ky.gov/dph/radioactive.htm>  
Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)  
Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>  
Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



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**From:** Partridge, George (EEC)  
**Sent:** Monday, February 08, 2016 10:51 AM  
**To:** Frame, Jason R  
**Cc:** Pendergrass, Curt (CHFS DPH)  
**Subject:** RE: TNORM disposal in KY

Jason;

Thank you for copying me on correspondence. I will be visiting the site in KY on Wednesday with the inspector from the DWM, George Weems, where this waste was disposed of from FBP.

George Partridge  
KDWM

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**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]  
**Sent:** Monday, February 08, 2016 10:44 AM  
**To:** Pendergrass, Curt (CHFS DPH)  
**Cc:** Keffler, Christopher (CHFS Rad Hlth); Partridge, George (EEC); McKinley, Matthew W (CHS-PH); Anderson, Danny J (EEC); Layselle, Maridely (EEC); Webb, April (EEC)  
**Subject:** RE: TNORM disposal in KY

Curt,

I'm bringing this up because of discussions WV agencies have had regarding out of state TENORM. Are the any issues the language in your compact banning out of state waste conflicting with the Interstate Commerce Act?  
Thanks

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Fax: (304) 558-0524  
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**From:** Pendergrass, Curt (CHFS DPH) [mailto:Curt.Pendergrass@ky.gov]  
**Sent:** Friday, February 05, 2016 2:50 PM  
**To:** Frame, Jason R  
**Cc:** Keffler, Christopher (CHFS Rad Hlth); Partridge, George (EEC); McKinley, Matthew W (CHS-PH); Anderson, Danny J (EEC); Loyselle, Maridely (EEC); Webb, April (EEC)  
**Subject:** RE: TNORM disposal in KY

Thanks Jason for pointing out my oversight on the attached radiochemical analysis of the sludge obtained from the oil and gas production fluid processing tanks at Fairmont Brine Products (<http://www.fairmontbrineprocessing.com/>). And thanks especially for the follow-up telephone call on what has transpired between your office and Fairmont Brine Products over the years. I would say 1,453.5 ± 200.78 pCi/g Ra-226 and 303.75 ± 40.774 pCi/g Ra-228, not to mention the elevated U-238 and Th-232 parents, is way over anyone's acceptable criteria for burying waste in anything but a hazardous waste landfill specifically licensed for the disposal of radioactive material. Now that we know your office put a halt to Fairmont Brine disposing of this material in WV and that the company then contacted Waste Management about helping them to dispose of this material properly and that it was Waste Management who paid for the attached Pace Analytical analysis and that it was Waste Management that told FBP that the material needed to be taken out west to a licensed disposal facility and obtained cost estimates for that proper disposal, the fact that FBP then chose to accept a much lower bid from Advanced TENORM Services of West Liberty, KY (<http://advtenorm.com/>) makes the company culpable in my book. We will be meeting next week with our colleagues in the Division of Waste Management to decide how best to address this issue since the wastes is now buried at several municipal solid waste landfills here in KY. Again, we just can't thank you enough for all your assistance in this matter.

Have a great weekend.  
Curt

#### ANALYTICAL RESULTS - RADIOCHEMISTRY

Parameters	Method	Act ± Unc (MDC)	Corr	Trac	Units	Analyzed	CAS No	Qual
Antimony-124	EPA 901.1	0.000 ± 0.674 (2.037)			pCi/g	06/15/15 16 51	14683-10-4	
		C:NA T:NA						
Cobalt-60	EPA 901.1	0.000 ± 0.565 (1.683)			pCi/g	06/15/15 16 51	10198-40-0	
		C:NA T:NA						
Iridium-192	EPA 901.1	0.000 ± 0.634 (1.680)			pCi/g	06/15/15 16 51	14694-69-0	
		C:NA T:NA						
Potassium-40	EPA 901.1	26.600 ± 19.036 (17.130)			pCi/g	06/15/15 16 51	13966-00-2	
		C:NA T:NA						
Radium-226	EPA 901.1	1453.500 ± 200.780 (44.630)			pCi/g	06/15/15 16 51	13982-63-3	
		C:NA T:NA						
Radium-228	EPA 901.1	303.750 ± 40.774 (7.817)			pCi/g	06/15/15 16 51	15262-20-1	
		C:NA T:NA						
Scandium-46	EPA 901.1	1.268 ± 1.784 (1.774)			pCi/g	06/15/15 16 51	13967-63-0	
		C:NA T:NA						
Silver-110M	EPA 901.1	2.381 ± 1.567 (1.549)			pCi/g	06/15/15 16 51	14391-76-5	
		C:NA T:NA						
Thorium-232	EPA 901.1	162.200 ± 392.170 (478.000)			pCi/g	06/15/15 16 51	7440-29-1	
		C:NA T:NA						
Uranium-238	EPA 901.1	94.336 ± 17.406 (17.780)			pCi/g	06/15/15 16 51		
		C:NA T:NA						

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Website: <http://www.chfs.ky.gov/dph/radioactive.htm>  
Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)  
Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>  
Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



**From:** Frame, Jason R [mailto:Jason.R.Frame@wv.gov]  
**Sent:** Friday, February 05, 2016 11:10 AM  
**To:** Pendergrass, Curt (CHFS DPH)  
**Cc:** Keffler, Christopher (CHFS Rad Hlth); Partridge, George (EEC)  
**Subject:** RE: TNORM disposal in KY

These results were provided to me by Waste Management while they were involved with the project. The said this was a combined average of the loads, but I did not specify the sampling methods so can't speak too that.

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**From:** Pendergrass, Curt (CHFS DPH) [mailto:Curt.Pendergrass@ky.gov]  
**Sent:** Friday, February 05, 2016 10:36 AM  
**To:** Frame, Jason R  
**Cc:** Keffler, Christopher (CHFS Rad Hlth); Partridge, George (EEC)  
**Subject:** RE: TNORM disposal in KY

Thanks Jason. That is exactly what I was hoping to hear. A WV regulation referencing a drive through radiation portal alarm of 2X background and 5 pCi/g Ra-226/228 above background, would be great if you can send me a link. Also, actual radiochemical data on the loads in questions would be extremely helpful. Does WV actually make companies like Fairmont Brine conduct radiological surveys and radiochemical analysis of oil and gas production fluids? I know that Republic Services operates many landfills here in KY and it is a company policy that all Republic landfills have drive through radiation portal monitors. We get our share of alarms for medical wastes in sewage sludge, usually long-lived isotopes such as I-131 which has a 8 day half-life. We even had a Republic landfill outside Ashland KY get a medical isotope alarm in a waste load from Huntington, WV not too long ago. That load was found to contain Tc-99m which meant that with a 6 hour half-life, the wastes was pretty fresh.

Thanks again for all your assistance.

Curt Pendergrass PhD

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Website: <http://www.chfs.ky.gov/dph/radioactive.htm>

Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)

Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>

Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



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**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]  
**Sent:** Friday, February 05, 2016 10:18 AM  
**To:** Pendergrass, Curt (CHFS DPH)  
**Cc:** Keffler, Christopher (CHFS Rad Hlth); Partridge, George (EEC)  
**Subject:** RE: TNORM disposal in KY

WV DEP is not involved in any type of radiological permitting. I believe you are referring to the drill cuttings disposal regs that we developed with WVDEP which set gate alarms of 2x background and then 5 pCi/g radium 226/228 above local background analytical limits. I may already have data for the loads. Will check.

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Fax: (304) 558-0524  
Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



---

**From:** Pendergrass, Curt (CHFS DPH) [<mailto:Curt.Pendergrass@ky.gov>]  
**Sent:** Friday, February 05, 2016 10:05 AM  
**To:** Frame, Jason R  
**Cc:** Keffler, Christopher (CHFS Rad Hlth); Partridge, George (EEC)  
**Subject:** RE: TNORM disposal in KY

Hello Jason,

I have huge favor to ask of you. Is there any way that you can contact Fairmont Brine Processing in Fairmont WV and ask them for actual data on these loads as to the activity concentration of Ra-226 + Ra-228 plus daughter products? I would presume the driving force behind FBP notifying your office of a regulated waste activity and being assigned a US EPA ID number was the radioanalytical analysis of this wastes and not the fact the wastes read 0.5-2.0 mR/hr, I presume on contact with the waste containers.

**sludge. The West Virginia Department of Environmental Protection (WVDEP) has received and processed FBP's Notification of Regulated Waste Activity Form. As a result, FBP was assigned a U.S. Environmental Protection Agency (US EPA) Identification Number (WVR000521948).**

Also, I remember seeing something in the lay press about WV issuing new regulations regarding TENORM. However, I can't seem to find anything on the web other this blurb below which references 185 Bq/kg or 5 pCi/g above natural background. I am assuming FBP analyzed the loads in question and determined they exceeded this WV limit. Also, I am assuming this limit is based on protecting public and health and safety of the citizens of WV but what I saw seemed to be more of a proposed rule and not an actual regulation (<http://apps.sos.wv.gov/adlaw/csr/readfile.aspx?DocId=8395&Format=PDE>). I am hoping that you can share copy or a link to the actual WV regulation which references this TENORM limit for disposal in WV. I believe OH chose to use this 5 pCi/g Ra-226 + Ra-228 plus daughter products as well as their limit for disposal in the regular waste stream.

#### 16.4. Exemptions.

**16.4.a. Persons who receive, own, possess, use, process, transfer, distribute, or dispose of TENORM are exempt from the requirements of this Section with respect to any combination of 226Ra and 228Ra if the materials contain, or are contaminated at, concentrations less than one hundred eighty five (185) bequerel per kilogram (five [5] pCi/gm) excluding natural background. This does not apply to consumer or retail products which are discussed in Subdivision 16.12.c. and Subsection 16.13. Using purposeful dilution to render TENORM waste exempt shall not be allowed without prior agency approval.**

Just to let you know, while KY lacks specific regs addressing TENORM, our Central Midwest Interstate Low-Level Waste Compact of which KY is a member along with IL, specifically prohibits the disposal of out-of-compact wastes here in KY. See below. How that ties in with the EPA's determination that "Wastes generated during the exploration, development, and production of crude oil, natural gas, and geothermal energy are categorized by EPA as "special wastes" and are exempt from federal hazardous waste regulations under Subtitle C of the Resource Conservation and Recovery Act (RCRA)" will be question for my colleagues in the Energy and Environment Cabinet to answer. But if you actual radioanalytic data on these loads from FBP that you could share with us, we would be extremely grateful.

Thanks,  
Curt

#### 211.863 Control of commerce of low-level radioactive waste in and out of Kentucky -- Prohibitions -- Exemption. <http://www.lrc.ky.gov/statutes/statute.aspx?id=8502>

(3) Naturally-occurring radioactive material (NORM) as defined in KRS 211.862(8) shall be the exclusive regulatory responsibility of the states, **except that no person shall import naturally occurring radioactive material (NORM) from outside the region for disposal in Kentucky, or dispose of such imported material in Kentucky, if the imports or disposal are inconsistent with policies of the commission.**

#### 211.869 Penalties. <http://www.lrc.ky.gov/statutes/statute.aspx?id=8505>

(1) Any person who fails to comply with any provision of KRS 211.859 or 211.863, or with any administrative regulations promulgated pursuant to KRS 211.859 or 211.865, or fails to comply with any order of the cabinet issued pursuant to KRS 211.859 or KRS 211.863 and 211.865 shall be assessed a civil penalty not less than ten thousand dollars (\$10,000) nor more than one hundred thousand dollars (\$100,000). Each day of the violation or noncompliance shall constitute a separate offense.

#### 211.862 Definitions for KRS 211.861 to 211.869. <http://www.lrc.ky.gov/statutes/statute.aspx?id=8501>

(8) "Naturally-occurring radioactive material" (NORM) means naturally occurring materials not regulated under the Atomic Energy Act of 1954, as amended, whose radionuclide concentrations have been increased by or as a result of human practices. Naturally occurring radioactive material does not include the natural radioactivity of rocks or soils, or background radiation, but instead **refers to materials whose radioactivity is technologically enhanced by controllable practices (or by past human practices);**

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Website: <http://www.chfs.ky.gov/dph/radioactive.htm>  
Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)  
Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>  
Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



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**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]  
**Sent:** Monday, February 01, 2016 11:30 AM  
**To:** Partridge, George (EEC)  
**Cc:** Pendergrass, Curt (CHFS DPH)  
**Subject:** RE: TNORM disposal in KY

- Number and type of trucks/ volume, etc. of the wastes. 35 vac boxes, unsure of volume but tractor trailer size.
- Dates and time period the shipments were sent. Shipments occurred during August 2015.
- The form or appearance of the waste when it was shipped (before solidification). What does it look like? Varied but typically a brown sludge, with a water layer on top.
- Level of radioactivity. Exposure rates were between 500 uR/hr and 2 mR/hr
- Name of company in Fairmont along with County that contracted with Advanced TENORM Services. Fairmont Brine
- Any knowledge where it was sent for solidification in Ashland, KY (?) prior to being sent to the landfill. See attachment

Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program  
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**From:** Partridge, George (EEC) [<mailto:George.Partridge@ky.gov>]  
**Sent:** Friday, January 29, 2016 3:48 PM  
**To:** Frame, Jason R  
**Cc:** Pendergrass, Curt (CHFS DPH)  
**Subject:** RE: TNORM disposal in KY

Jason;

I will be joining our field inspectors at landfills and waste sites in Eastern Kentucky to investigate our concerns regarding TENORM disposal.

If you could provide additional information related to our conversation about the shipments by Advanced TENORM Services to Kentucky that would be helpful.

As much detail as possible will be helpful as we review manifests, etc. at the landfills.

Information such as:

- Number and type of trucks/ volume, etc. of the wastes.
- Dates and time period the shipments were sent.
- The form or appearance of the waste when it was shipped (before solidification). What does it look like?
- Level of radioactivity.
- Name of company in Fairmont along with County that contracted with Advanced TENORM Services.
- Any knowledge where it was sent for solidification in Ashland, KY (?) prior to being sent to the landfill.

I know some of the above items we discussed in our conversation but I was so floored with the news I want to be sure I confirmed the understanding we have of the situation before we move forward with site visits.

Also our Assistance Director for the DWM is aware of the situation along with our Hazardous Waste Branch.

I appreciate all you and Curt do for our respective states.

Thanks again for all the time you devoted to corresponding and following up with us.

Look forward to hearing from you!

George

*George P. Partridge Jr., PhD, P.E., QEP*  
Department for Environmental Protection  
KY Division of Waste Management

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**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]  
**Sent:** Thursday, January 28, 2016 11:09 AM  
**To:** Partridge, George (EEC)  
**Subject:** FW: TNORM disposal in KY

Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program  
Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division  
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Fax: (304) 558-0524  
Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



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**From:** Pendergrass, Curt (CHFS DPH) [<mailto:Curt.Pendergrass@ky.gov>]  
**Sent:** Tuesday, January 19, 2016 4:33 PM  
**To:** Frame, Jason R  
**Cc:** McKinley, Matthew W (CHS-PH); Brock, Stephanie C (CHS-PH)  
**Subject:** RE: TNORM disposal in KY

Hello Mr. Frame,

Thank you for the follow-up e-mail on the purported disposition of WV TENORM wastes here in KY by Advanced TENORM Services of Liberty, KY (<http://advtenorm.com/>). We will follow up with the company's president, Cory Hoskins, and ascertain the nature and extent of their activities. We will also reach out to our colleagues in the Energy and Environment Cabinet Division of Waste Management since they regulate landfills here in KY.

Thanks again for reaching out to me regarding this matter.

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Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)  
Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>  
Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



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**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]  
**Sent:** Tuesday, January 19, 2016 12:51 PM  
**To:** Pendergrass, Curt (CHFS DPH)  
**Cc:** Webb, April (EEC); [George.Partridge@ky.gov](mailto:George.Partridge@ky.gov); Loyselle, Maridely (EEC); Keffer, Christopher (CHFS Rad Hlth)  
**Subject:** RE: TNORM disposal in KY

Mr. Pendergrass,

I apologize for digging up this old email, but I don't believe I received any further response. I believe a company operating as "Advanced TENORM Services" is continuing to facilitate the disposal of WV waste in KY landfills. Please advise on this issue. Thanks

Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program  
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Fax: (304) 558-0524  
Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



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**From:** Pendergrass, Curt (CHFS DPH) [<mailto:Curt.Pendergrass@ky.gov>]  
**Sent:** Tuesday, July 21, 2015 9:45 PM  
**To:** Frame, Jason R  
**Cc:** Webb, April (EEC); [George.Patridge@ky.gov](mailto:George.Patridge@ky.gov); Loyselle, Maridely (EEC); Keffer, Christopher (CHFS Rad Hlth)  
**Subject:** RE: TNORM disposal in KY

Hello Mr. Frame,

While KY does not currently have any regulations dealing with the control and disposal of NORM/TENORM waste generated in the oil and gas industry from hydraulic fracturing, we do have statutes on the books establishing the Central Midwest Interstate Low Level Radioactive Waste Compact of which KY is a member with IL. The compact strictly forbids the disposal of any and all radioactive materials generated outside of IL and KY anywhere in our states. This obviously includes fracking wastes generated in West Virginia. I am Cc'ing my colleagues in the Division of Solid Waste on this e-mail since disposal of wastes containing hazardous materials including NORM/TENORM in landfills here in KY is their regulatory purview. Ohio and Pennsylvania both have regulations addressing the disposal of NORM/TENORM contaminated waste so Advanced TENORM Services might want to check with the authorities in those states to see what is required.

Regards,

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**From:** Keffer, Christopher (CHFS Rad Hlth)  
**Sent:** Tuesday, July 21, 2015 1:19 PM  
**To:** Pendergrass, Curt (CHFS DPH)  
**Cc:** [jason.r.frame@wv.gov](mailto:jason.r.frame@wv.gov)  
**Subject:** TNORM disposal in KY

Dr. Pendergrass,

I was contacted this morning by Mr. Jason R. Frame; a member of the West Virginia radiation program. He was inquiring about a West Virginia company's intent to dispose of TNORM from a "fracking" operation here in Kentucky by using the services provided by Advanced TENORM Services L.L.C. (<https://app.sos.ky.gov/itshow/!s!30yqolkfdaebcz4hporemp4!/>[default.aspx?path=ftsearch&id=0904260&ct=068cs=99999](https://app.sos.ky.gov/itshow/!s!30yqolkfdaebcz4hporemp4!/default.aspx?path=ftsearch&id=0904260&ct=068cs=99999)). From Mr. Frame's understanding, Advanced TENORM Services L.L.C. (located in West Liberty, KY) will be solidifying the "facking" sludge in Ashland, KY and then sending it to a Class D landfill in Irvine, KY. Mr. Frame's question was in regards to whether or not we would allow the disposal of TNORM from other states in the state of Kentucky or send it back to the materials origins. I informed Mr. Frame that our office does not currently have regulation regarding TNORM in place and that each landfill may have their own limits on what they accept or turn away in regards to radiation levels.

If you have any input on this matter please contact Mr. Frame at the e-mail address provided ([jason.r.frame@wv.gov](mailto:jason.r.frame@wv.gov)).

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