From: Marti Olesen [mailto:molesen12@gmail.com]
Sent: Tuesday, June 24, 2014 9:27 AM
To: Reg-Comment
Subject: Comments for the proposed 3rd party rule making for Regulations 5 and 6

---------- Forwarded message ----------
From: **Marti Olesen**
Date: Tuesday, June 24, 2014
Subject: I support the proposed 3rd party rule making for R
To: Marti <molesen12@gmail.com>

I support the proposed 3rd party rule making for Regulations 5 and 6 for the Buffalo River watershed ban on swine CAFO permits.
I am especially concerned about future CAFOs in the watershed of this 1st National River's watershed because of the likelihood of CAFO waste (nutrients) polluting the surface and groundwater in its karst topography.
While there is water testing being done by two parties, the Sharpley University of Arkansas team which is strictly studying only surface water degradation (and has no hydrogeologist on its team) and the private dye trace monitoring team led by Dr. Brahana, retired U of A professor, I am most concerned that despite these honorable quests, the true nature of water/pollutant dispersal in karst must be a firm baseline for the ban.
In hydrogeologist Thomas Aley's original research into the karst topography for this region, conducted during the controversy over the establishment of a landfill in the Pindall, Arkansas, vicinity (financed not by Arkansas regulatory agencies, but by a group of local residents and the National Park Service), it was discovered that surface and groundwater were inextricably connected not only by vertical conduits and fractures, but also by lateral channels. (Complex Radial Flow of Groundwater in Flat-Lying Rediduum-Mantled Limestone in the Arkansas Ozarks.) In fact, in further research by Ralph Ewers to discover surface /groundwater connections the distinguishing lines between point and non point pollution in karst was found to be truly moot. (See Ralph O. Ewers, Ph.D., director, Groundwater Research Laboratory, Dept. Of Geology, Eastern Kentucky University, Ewers Water Consultants, Inc. Richmond, Kentucky, "The Response of Landfill Monitoring Wells on Limestone (Karst) Aquifers to Point Sources and Non Point Sources of Contamination.") Research by James F. Quinlan comprising methods and rationale for accurate water testing in Karst for EPA procedures summarizes the difficulty: "The hydrology of karst terranes is significantly different from that of terranes characterized by granular and fractured rocks--flow velocities in karst may be several orders of magnitude higher than in other ground-water settings; Darcy's Law describing flow is rarely applicable; 2) For monitoring to be relevant and reliable in karst terranes, monitoring procedures must be radically different from those in non-karst terranes." (Ground-Water Monitoring in Karst Terranes: Recommended Protocols and Implicit Assumptions, James F. Quinlan.)
Mike Masterson, published on MikeMasterson'sMessenger.com, "Not the First Conflict Over Depositing Animal Waste Near the Buffalo,"in April of 2013, wrote that Thomas Aley explained to him, "Hydrology testing is absolutely necessary when proposing to dump potentially contaminating waste anywhere across the karst-riddled Ozarks, 'especially in the watershed of

the nationally significant Buffalo National River. It becomes a matter of how the surface waters flow and interact,' he explained, adding, 'What we learned at Pindall was that the distance from the Buffalo River doesn't necessarily ensure protection....What we showed was the level of care that must be taken before waste disposal practices are put into effect within miles of the Buffalo National River,' he said."

I realize that regulations governing landfill operations and CAFOs are not the same. I agree that in many cases there is no reason to compare them. However, since karst topography treats the runoff of dissolvable and/or particulate applied materials the same way, whether from human or swine sources, the effects of both are comparable and should be taken into account in approving this rule making proposal for the Buffalo River Watershed (BRW.)

As you can see in the ADEQ requirements for landfills in karst terrain below, this topography as it relates to water quality is taken seriously by our government, and regulations are enforced so as to protect the waters that flow above and under the surface due to their inextricable relationship in this formation.
Since ADEQ requires only a general permit for swine CAFOs, the absence of specified CAFO regulations of such operations in karst is lacking. Even the nutrient management plans required are not sufficient to address karst. If ADEQ used the landfill water quality karst regulations noted below to determine the appropriate placement and structure of waste ponds or lagoons for CAFOs, the Buffalo River Watershed would be clearly unsuitable.
Using information from this comparison will prevent damages to the watershed because the research has successfully been done on the movement of water through karst. Although it was conducted for landfill purposes, the results are applicable for this case.

Sometimes we need to see beyond limiting factors to make responsible decisions. When we have the necessary information and ability to do the right thing for our Buffalo National River watershed and the people who use its waters for drinking, recreation, and small farming, then it is time to act upon that knowledge and approve these third-party rulemaking proposals for changing Regulation No. 5 and 6.

ADEQ Landfill regulation, Reg. 22, is worth taking into account especially since water quality is the issue when disposing of animal waste (human or swine.) The potential for leaching into waters used for drinking and recreation is worth exploring.
Note especially Reg.22.425- Landfills In Boone And St. Joe Formations.

REGULATION NO. 22 SOLID WASTE MANAGEMENT RULES
ADEQ Landfill application for permits

Here are applicable notes copied from Reg. #22 landfill regs.

Definitions:

Disposal means abandoning, depositing, releasing, dumping, spilling, leaking, or placing of any solid waste into or on any land or water so that such solid waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any water.

Disease vectors means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.

Disposal site or Disposal facility means any place at which solid waste is dumped, abandoned, or accepted or disposed of for final disposition by incineration, landfilling or any other method.....

Endangered or threatened species means any species listed as such pursuant to Section 4 of the Endangered Species Act.

Ground water or groundwater means water below the land surface in a zone of saturation.

Industrial solid waste means solid waste generated as a result of manufacturing or industrial processes that is not a hazardous waste regulated under Subtitle C of RCRA or as defined by Regulation Number 23, Sections 260.10 and 261.3, of the Pollution Control and Ecology Commission. Such waste may include, but is not limited to, waste resulting from the following manufacturing or industrial processes: Electric power generation; fertilizer/agricultural chemicals;....

Karst terrains means areas where karst topography, with its characteristic surface and subterranean features, is developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terranes include, but are not limited to, sinkholes, sinking streams, caves, large springs, and blind valleys.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for agricultural purposes or for treatment and disposal.

Monofill means a separately permitted landfill or landfill unit specifically designed and operated for the sole disposal of incinerator ash, sludge, tires, or other wastes where only a single type of waste is placed in the landfill unit.

Putrescible wastes means solid waste which contains organic matter capable of being decomposed by microorganisms and of such a character and proportion as to be capable of attracting or providing food for birds and other potential disease vectors.

Underground drinking water source means an aquifer supplying drinking water for human consumption, or an aquifer in which the ground water contains less than 10,000 mg/l total dissolved solids.

(b) For purposes of this section:
(1) Unstable area means a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and Karst terrain.
(2) Structural components means liners, leachate collection systems, final covers, run- on/run-off

systems, and any other component used in the construction and operation of the facility that is necessary for protection of human health and the environment.
(3) Poor foundation conditions means those areas where features exist which indicate that a natural or man-induced event may result in inadequate foundation support for the structural components of an solid waste unit.

(4) Areas susceptible to mass movement means those areas of influence (i.e., areas characterized as having an active or substantial possibility of mass movement) where the movement of earth material at, beneath, or adjacent to the municipal solid waste landfill unit, because of natural or man-induced events, results in the down slope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but are not limited to, landslides, avalanches, debris slides and flows, soil fluction, block sliding, and rock fall.

(5) Karst terrain means areas where karst topography, with its characteristic surface and subterranean features, is developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terrain include, but are not limited to, sinkholes, sinking streams, caves, large springs, and blind valleys.

Reg.22.409- Closure Of Existing Landfill Units
(a) Applicability - Existing Class 1 units that cannot make the demonstrations specified in Reg.22.402, pertaining to airports, Reg.22.403 pertaining to floodplains, or Reg.22.407 pertaining to unstable areas, must close by October 9, 1996, in accordance with the requirements of Reg.22.1301 and conduct post-closure activities in accordance with Reg.22.1301

Reg.22.414- Disease Vector Control
(a) Applicability - As provided in 40 CFR 258.22, owners or operators must prevent or control on-site populations of disease vectors using techniques appropriate for the protection of human health and the environment.

Reg.22.420- Liquids Restrictions
(d) Bulking/Mixing Methods - The liquid waste or waste containing free liquids shall be placed in the approved bulking area and shall be immediately crushed and blended with an approved absorbent material. Air drying of wastes shall not be utilized where the practice causes or contributes to the development of nuisance conditions including odors and vector attraction.
(e) Free Liquids Determination - Treated liquid wastes must not exhibit free liquids as determined by the paint filter test . The blended material must be capable of supporting cover soil and equipment prior to disposal in the landfill.
(f) Operation of Bulking/Mixing Area - The processing of liquid wastes shall not interfere with the normal waste handling operations or maintenance of the facility. The Department reserves the right to prevent the facility from further receipt and processing of this waste should it be determined the material is mishandled in any way.
(g) Liquid Waste Management Plan - An approved liquid waste management plan meeting the requirements of this section shall be maintained on-site and shall be followed in the treatment of liquid waste. The plan shall discuss at a minimum the following information:
(1) Purpose and regulations;
(2) Types of wastes acceptable for treatment and procedures for obtaining approval for

acceptance;

Reg.22.424- Minimum Design Criteria
(a) Applicability - New Class 1 Landfills and lateral expansions shall be constructed:
(1) In accordance with a design approved by the Director. The design must ensure that the concentration values listed in Table 1 of this section shall not be exceeded in the uppermost aquifer at the relevant point of compliance, as specified by the Director under paragraph (d) of this section, or
(2) With a composite liner, as defined in paragraph (b) of this section and a leachate collection system that is designed and constructed to maintain less than a 30-cm (12 inch) depth of leachate over the liner.
(b) Definition - For purposes of this section, "composite liner" means a system consisting of two components; the upper component must consist of a minimum 30-mil flexible membrane liner (FML), and the lower component must consist of at least a two-foot layer of compacted soil with a
hydraulic conductivity of no more than 1 x 10-7 cm/sec. FML components consisting of High
4-17
Density Polyethylene (HDPE) shall be at least 60-mil thick. The FML component must be installed in direct and uniform contact with the compacted soil component. A protective layer consist of no less than twelve (12) inches of material approved by the Department and suitable to protect the FML component.
(c) Liner Design Approval - When approving a design that complies with paragraph (a)(1) of this section, the Director shall consider at least the following factors:
(1) The hydrogeologic characteristics of the facility and surrounding land;
(2) The climatic factors of the area; and
(3) The volume and physical and chemical characteristics of the leachate.
(d) Point of Compliance - The relevant point of compliance specified by the Director shall be no more than 150 meters from the waste management unit boundary and shall be located on land owned by the owner of the municipal solid waste landfill unit. In determining the relevant point of compliance, the Director shall consider at least the following factors:
(1) The hydrogeologic characteristics of the facility and surrounding land;
(2) The volume and physical and chemical characteristics of the leachate;
(3) The quantity, quality, and detection, of flow of ground water;
(4) The proximity and withdrawal rate of the ground-water users;
(5) The availability of alternative drinking water supplies;
(6) The existing quality of the ground water, including other sources of contamination and their cumulative impacts on the ground water and whether ground water is currently used or reasonably expected to be used for drinking water;
(7) Public health, safety, and welfare effects; and
(8) Practicable capability of the owner or operator.
(e) Minimum design criteria shall comply with the requirements under Reg.22.1301 et seq. where applicable.

4-19

Reg.22.425- Landfills In Boone And St. Joe Formations

(a) Applicability - The following are minimum design standards for Class 1 landfills that are located within the outcrop area of the Boone and St. Joe Formations. The design phase of a project must neutralize all limitations noted in the site characterization study through engineering modification or operating methods. The design of the containment structure must meet or exceed the minimum standards listed in these regulations.
(b) Separation Requirements -
(1) A minimum separation of ten (10) feet must be maintained between the bottom of the bottom liner system and the seasonal high water table surface.
(2) A minimum vertical separation of ten (10) feet must be maintained between the bottom liner and the highest point of the bedrock or pinnacles.
(3) All fill structures and operations must be above the one hundred (100) year flood elevation.

(c) Liner System -

(1) The minimum slope on the bottom liner must insure positive drainage of leachate after maximum loading and maximum expected strain.
(2) All bottom liner systems must consist of a double composite separated by a leak detection system. Each composite liner shall consist of an upper geomembrane liner (60 mil minimum thickness) directly overlying a low permeability soil layer, as described in Reg. 22.424(b).
(3) The soil and synthetic components of the composite liner must meet the requirements of Reg. 22.428.
(d) Leachate Collection System - The double composite liner system must have a leachate removal system directly overlying the upper composite liner. In addition to the requirements of Reg.22.429, the leachate collection and removal system must meet the following standards:
(1) The system must be designed such that leachate head above the primary composite liner does not exceed one foot under the most severe conditions anticipated.
(2) The drainage material must be free of organic and carbonate material, contain less than five percent (5%) by weight which passes the #200 sieve, have a minimum hydraulic conductivity of 1 x 10-3 and be a minimum of twenty-four (24) inches in thickness. Equivalent drainage nets or fabric may be used in lieu of the twenty-four (24) inch drainage layer provided a substitute protective layer is provided and the system provides an equivalent hydraulic conductivity to the twenty-four (24) inch layer.
(3) Leachate collection pipes must be incorporated into the drainage layer to convey liquid out of the landfill to storage tanks or a treatment system. The pipes must be a minimum of six (6) inches in diameter and must be chemically compatible with the leachate generated at the landfill and be structurally capable of supporting the maximum static and dynamic load anticipated from the overlying fill material and construction equipment.
(e) Leak Detection System - The double composite liner system must have a leak detection system located between the upper composite and the lower composite liners. The leak detection system must conform to the following standards:
(1) The minimum thickness of the coarse grained material must be 1 foot;
(2) Leak detection systems shall meet the standards for leachate collection system design and construction. A minimum hydraulic conductivity of 1 x 10-3 cm/sec must be obtained in the leak detection system material.
(3) An action leakage rate must be developed for the design and approved by the Department. If leakage rates exceed the action leakage rate, fill operations must cease and the Department must

be notified. A written contingency plan must be developed for the facility which outlines steps and measures to be taken if the action leakage rate is exceeded.

(4) Daily records of fluid accumulation in the leak detection system must be maintained by the owner or operator.

(f) Final Cover Design - In addition to the requirements of Reg.22.1301, the top liner or cap of the landfill must be designed to minimize infiltration of storm water into the waste mass. The cover system design must incorporate the following minimum standards:
(1) A gas venting layer at least six (6) inches in thickness that meets the standards for leachate collection system design and construction having a minimum hydraulic conductivity of 1 x 10-3 cm/sec and no more than 5 percent by weight passing the #200 sieve, must be placed directly above the final lift of waste. Gas vent risers with slotted screen which extend at least 3 feet into the waste mass and fitted with a goose neck cap or equivalent to allow effective venting must be installed in the landfill. Vent spacing shall be a minimum of 1 per acre. The annular space in the gas vent risers must be backfilled with clean crushed stone to enhance gas migration from the venting layer to the riser.

(2) A composite infiltration barrier system shall be installed above the gas venting layer. The barrier system shall consist of two components; the upper component consisting of a minimum 30-mil flexible membrane liner (high density polyethylene shall be at least 60-mil thick), and the lower component consisting of at least a 18 inch layer of (4) compacted soil with a hydraulic conductivity of no more than 1 x 10-7 cm/sec. The flexible membrane liner component must be installed in direct and uniform contact with the compacted soil component. The composite cover system shall be designed and constructed in accordance with the requirements of Reg.22.428 except that the fines content of the barrier layer soil must be fifty percent (50%) or greater passing the #200 sieve. The barrier soil be free of large objects and must meet the following specifications:
(i) The barrier soil layer must have a Plasticity Index of greater than 10 percent.
(ii) Fines content of the barrier layer soil must be 50 percent or greater passing the #200 sieve.
(iii) Material greater than a #4 sieve must not compose more than 20 percent by weight of the soil.
(iv)
No particles greater than 1 inch in diameter.
A barrier protective layer must be placed directly over the barrier soil layer. This protective layer must be at least twenty four (24) inches in thickness and the lower 6 inches must be free of objects greater than 1 inch in diameter.
A top soil layer of at least six (6) inches must be placed above the barrier soil protective layer. The top soil layer must be capable of sustaining vegetative growth over the landfill.

In contrast, note the difference between the holding pond liner for a CAFO that follows general NPDES permit requirements in the Notice of Intent (NOI) developed by DeHaan, Grabbs and Associates, LLC, of North Dakota and Kansas, for the first CAFO in Arkansas. In the NOI the conforming pond liner will be placed above 18 inches of compacted, low permeable soil (compare to 10 feet above highest point of bedrock or highest pinnacles) and shall not contain rocks > 4 inches in diameter (compare to 1 inch in landfill liner systems in karst.) It is identified

as an earthen lagoon type of storage and allowed to leak up to 5,000 gallons per acre. (Compare to extensive double liners with built-in leak detectors for landfills in the Boone and St. Joe formations.) No cover is required for the waste ponds, no venting system of noxious or nuisance gases, no catchment for overflow in times of excessive rainfall. The sheer weight of a CAFO combined with its storage ponds and their permitted leakage could shift unstable underground limestone formations to collapse or fracture in unanticipated ways. (Note that the karst landfill Reg.22, subset 4-(b)(1) places karst under "Unstable area.")

Accurate routine monitoring in karst, as the research cited at the beginning of this comment describes, would require deep and thorough explorations to detect possible pockets, caves or hidden sinkholes which would be expensive and problematic. While it is true that a swine CAFO is not a landfill, in many respects both deal with concentrated wastes that affect the surface and underground water resources in karst, and taking this comparison into consideration presents an opportunity to prevent damages from the unpredictable movement of water through karst terrain. It is reasonable to admit that the comparisons made are applicable for this case.

As Jill Rohrbach in "Travel Arkansas" put it, "Anyone who has gazed upon Big Bluff, seen the reflection of Skull Rock on a fall day, hiked the trail to Indian Rockhouse, visited Collier Homestead near Tyler Bend, guided a canoe down the river's many miles, stuck their toes or a fishing rod in the water, or a myriad of other experiences knows the Buffalo River is definitely worthy of the national designation.

Today be thankful for those determined souls that fought to keep this free-flowing stream. Then make plans to visit it, and be mindful to protect it, and treat it well while you are there. Like Jimmy Driftwood sang, the Buffalo River is 'Arkansas's Gift to the Nation. America's Gift to the world."

It is my hope that by taking the time to review and compare the regulations our state has in place to preserve our water quality, especially in karst terrain, the commission will approve these third-party rulemaking proposals for changing Regulations No. 5 and 6, and the Buffalo National River watershed will continue to be the jewel of our state for generations.

I would appreciate a response to my comments,

Sincerely,

Marti Olesen