

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

APPLICANT: AMERICAN ENERGY -)
WOODFORD, LLC)
)
RELIEF SOUGHT: DISPOSAL WELL AMENDMENT)
TO PERMIT NO. 1303520067)
)
LEGAL DESCRIPTION: W/2 NE/4 NE/4 NE/4 OF)
SECTION 32, TOWNSHIP 19)
NORTH, RANGE 1 WEST,)
PAYNE COUNTY, OKLAHOMA)
WELL NAME: HOPKINS SWD 1-32)

CAUSE PD NO.
201500003

FILED
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CORPORATION COMMISSION
OF OKLAHOMA

APPLICANT: AMERICAN ENERGY -)
WOODFORD, LLC)
)
RELIEF SOUGHT: DISPOSAL WELL AMENDMENT)
TO PERMIT NO. 1303520068)
)
LEGAL DESCRIPTION: NE/4 SE/4 SW/4 SE/4 OF)
SECTION 2, TOWNSHIP 18)
NORTH, RANGE 1 WEST,)
PAYNE COUNTY, OKLAHOMA)
WELL NAME: BODE SWD 1-2)

CAUSE PD NO.
201500004

APPLICANT: AMERICAN ENERGY -)
WOODFORD, LLC)
)
RELIEF SOUGHT: DISPOSAL WELL AMENDMENT)
TO PERMIT NO. 1403710056)
)
LEGAL DESCRIPTION: NW/4 SW/4 SW/4 SE/4 OF)
SECTION 7, TOWNSHIP 19)
NORTH, RANGE 2 EAST, PAYNE)
COUNTY, OKLAHOMA)
WELL NAME: B&W WEATHERS SWD 1-7)

CAUSE PD NO.
201500006

REPORT OF THE OIL AND GAS APPELLATE REFEREE

These Causes came on for hearing before **David D. Leavitt**, Administrative Law Judge for the Corporation Commission of the State of Oklahoma, on the 5th day of February, 2015, at 8:30 a.m. in the Commission's Courtroom, Jim Thorpe Building, Oklahoma City, Oklahoma, pursuant to notice given as required by law and the rules of the Commission for the purpose of taking testimony and reporting to the Commission.

APPEARANCES: **Charles L. Helm**, attorney, appeared on behalf of applicant, American Energy - Woodford, LLC ("AEW"); **Susan Conrad**, Deputy General Counsel, appeared on behalf of the UIC Department of the Commission; and **James L. Myles**, Deputy General Counsel for Deliberations, filed notice of appearance.

The Administrative Law Judge ("ALJ") filed his Report of the Administrative Law Judge and Amended Report of the Administrative law Judge on the 11th day of May, 2015, to which Exceptions were timely filed and proper notice given of the setting of the Exceptions.

The Appellate argument concerning the Oral Exceptions was referred to **Patricia D. MacGuigan**, Oil and Gas Appellate Referee ("Referee"), on the 26th day of June, 2015. After considering the arguments of counsel and the record contained within these Causes, the Referee finds as follows:

STATEMENT OF THE CASE

AEW TAKES EXCEPTION to the recommendation of the Administrative Law Judge ("ALJ") that AEW's applications in PD Causes 201500003, 201500004 and 201500006, covering current salt water disposal ("SWD") wells requesting to have their injection rates modified, should be continued until such time that AEW can provide the Commission with more information.

On November 17, 2014, AEW filed Cause PD 201500003 for administrative approval to operate the Hopkins SWD #1-32 ("Hopkins SWD well") well located in the W/2 NE/4 NE/4 NE/4 of Section 32, T19N, R1W, Payne County, Oklahoma at an injection flow rate of 30,000 BWPD at a surface pressure of 2,000 psig. The Hopkins SWD well currently operates under Permit No. 1303520067 at a maximum injection rate of 5,000 BWPD at a surface pressure of 2,000 psig.

On November 17, 2014, AEW filed Cause PD 201500004 for administrative approval to operate the Bode SWD #1-2 ("Bode SWD well") well located in the NE/4 SE/4 SW/4 SE/4 of Section 2, T18N, R1W, Payne County, Oklahoma at

an injection flow rate of 30,000 BWPD at a surface pressure of 2,000 psig. The Bode SWD well currently operates under Permit No. 1303520068 at a maximum injection rate of 5,000 BOPD at a surface pressure of 2,000 psig.

On November 17, 2014, AEW filed Cause PD 201500006 for administrative approval to operate the B&W Weathers SWD #1-7 ("Weathers SWD well") well located in the NW/4 SW/4 SW/4 SE/4 of Section 7, T19N, R2E, Payne County, Oklahoma at an injection flow rate of 30,000 BWPD at a surface pressure of 2,000 psig. The Weathers SWD well currently operates under Permit No. 1403710056 at a maximum injection rate of 5,000 BWPD at a surface pressure of 2,000 psig.

These applications were submitted to the Underground Injection Control ("UIC") department for approval. The proposed increased injection rates and pressures were tentatively approved pending an evaluation of whether the SWD wells were located in a seismically active area. The UIC staff determined that the wells were in a seismically active "yellow" zone, requiring the applications to be submitted to an ALJ for review in a formal evidentiary hearing with respect to its potential to induce seismicity and harm human health and the environment. The hearing was held on February 5, 2015 and testimony and evidence were submitted to the Commission in support of the causes. At the end of the hearing, the ALJ took the matter under advisement. Prior to the issuing of the ALJ's Report, AEW reopened the record by motion to submit additional testimony and evidence, which the ALJ then heard on April 10, 2015 and issued a report following the hearing.

AEW TAKES THE POSITION:

1) The ALJ's recommendations are contrary to law; contrary to the evidence presented; arbitrary; unreasonable; in excess of the Commission's jurisdiction with regard to SWD wells; and significantly, if not entirely, based upon documents or sources of information outside the record in these causes, and as such, in violation of due process with regard to AEW's rights.

2) The ALJ correctly found that: "...the science linking oil and gas activity to induced seismicity has not been settled conclusively." (See page 13, paragraph 26 of Report) The ALJ again correctly found that: "The Commission's ALJ's are not retained as technical experts by the Commission and cannot testify as technical experts, but must rely upon the opinions and testimony of the experts representing an Applicant and the Commission when they weigh the evidence and make their independent recommendation." (See page 18, paragraph 45 of Report)

If the ALJ in the instant case had confined his inquiry to the opinions and testimony of the experts representing AEW and Commission in this case, the

ALJ would have to find that the AEW applications should be granted upon the terms and conditions recommended and negotiated between the UIC Staff and AEW.

3) However, ignoring his own findings, the ALJ assumes a direct casual relationship between SWD wells and seismicity by review of website materials (some of which were not even posted until after the record was closed in the instant causes). With this flawed assumption, the ALJ begins a review of federal and state statutes that are not applicable to SWD wells. The improper attempt to correlate and apply the law of public nuisance is particularly flawed, as there is absolutely no evidence in the record that could support a finding that the existing SWD wells in the present application have ever or would ever constitute a public nuisance.

4) The ALJ erred in finding that "...the disposal of the saltwater by underground injection has compromised the productive capacity of some of the state's disposal rock formations, such as the Arbuckle formation..." (See page 17, paragraph 38 of Report)

This conjecture is without merit. There is absolutely no evidence in the record in these causes that the Arbuckle is productive of oil and gas which could be compromised by disposal of saltwater. To the contrary, the Arbuckle is used for disposal because it is not productive of oil and gas and is a good candidate for disposal because it is a thick reservoir with high porosity and permeability with normal pressure. The uncontroverted testimony clearly shows the Arbuckle has a large capacity to hold water and has been approved by the Commission throughout this area as a disposal formation.

5) The ALJ erred in finding that the Commission needs to: "...prevent the continuous waste of disposal capacity of the Arbuckle formation..." (See page 17, paragraph 39 of Report)

Again, this conjecture is without merit and lacks any basis to support it. There is absolutely no evidence in the record in these causes that there is any waste of disposal capacity of the Arbuckle in the area surrounding the three existing disposal wells which are the subject of these hearings.

6) The ALJ erred in concluding that waste is occurring every time a well in Oklahoma disposes of water in the Arbuckle: "The Commission can thus prevent waste by requiring all applicants that seek permits for new SWD wells or seek permission to increase the injection rates of existing SWD wells in the Arbuckle complete detailed engineering and economic studies of the feasibility of alternate means of handling produced water other than disposal into the Arbuckle by injection wells." (See page 18, paragraph 40 of Report)

Again, this unsubstantiated conjecture that waste is occurring is not supported by the evidence in these causes, nevertheless, the suggestion clearly exceeds the Commission's jurisdiction in regard to whether or not the requested rate and pressure increase of the existing wells should be authorized. The Commission has already approved the Hopkins SWD well, the Bode SWD well and Weathers SWD well into the Arbuckle. The Commission orders approving these wells for disposal is void of any findings or conclusions regarding detailed engineering and economic studies of the feasibility of alternate means of handling produced water other than disposal into the Arbuckle by injection wells. In fact, no order of the Commission has such a finding because it exceeds the Commission's jurisdiction.

Nevertheless, because the question was posed by the ALJ to the expert witness for AEW, the only evidence in the record of these causes clearly shows there is no economic method to dispose of saltwater in the area other than through disposal. (See page 11, paragraph 21 of Report)

7) The ALJ erred in finding that the Commission lacks rules regarding the review process for SWD well applications: "Here the Commission also has a responsibility to the regulated community to clearly define what rules must be followed and what evidence must be presented by an applicant that would enable the Commission's engineers and scientists to address the risks of induced seismicity presented by the operation of a saltwater disposal well". (See page 18, paragraph 42 of Report)

Contrary to the ALJ's findings above, the Commission does have rules and procedures to follow with regard to the review process for SWD wells. Those rules and procedures provide specific requirements for an applicant to proceed with a request for a new SWD well or a modification of an existing SWD well. AEW in these causes has met every procedural requirement for a final order to be issued granting an increase in rates and pressures of the existing wells. The increase is mandated because of the numerous new horizontal wells drilled by AEW in the immediate area which need an increase in the existing disposal well rates and pressures to produce.

In reliance upon the Commission rules and procedures, AEW has invested millions of dollars in developing the oil and gas resources in this area and is now requesting the same review used by the Commission in all other applications within an area of seismicity. When AEW was notified by UIC that the applications would require a hearing because of past seismicity in the area, they followed the rules and procedures of setting the cause for hearing and meeting with the Commission technical and legal departments. From the Pre-hearing Technical Conferences, AEW and Commission Staff discussed seismicity in the area and reviewed the Oklahoma Geological Society ("OGS") reported faulting. AEW agreed to all of the Staff recommendations, including

the proposed Interim Order, specific pressure testing requirements, acknowledgment of the traffic light system in place and the reporting requirements and monitoring of disposed fluids. AEW also agreed to modify the existing well's design where requested by Staff. All of the material items in the requested applications were discussed and negotiated with the Staff before the hearings and evidence to that effect was presented to the ALJ during the hearings.

8) Nevertheless, the ALJ erred in concluding and finding that: "When asked by the ALJ to make a recommendation as a technical expert and representative of the UIC Department about the risks posed by increasing the injection rates and pressures of the SWD wells with respect to inducing seismicity, he said that he couldn't make a recommendation, presumably because he doesn't have sufficient information to review upon which to make a decision." (See Page 12, paragraph 24 of Report)...The ALJ also found on page 18, paragraph 44, that "During the hearing, however, the Commission's UIC expert who reviewed the Application and AEP's plan of development could not recommend the increases in injection rates and surface pressures requested in the Applications, indicating to the ALJ that the information submitted by AEP would not comprise sufficient information to allow the UIC Department to make a recommendation about the risks of induced seismicity."

The ALJ's characterization of the witness' testimony and the derived presumptions are incorrect and in error. The testimony of the UIC witness was that all three of the existing SWD wells had adequate protection to prevent contamination of treatable water, but that UIC is taking no position pertaining to seismicity. The UIC witness stated that in order to continue monitoring and reviewing oil and gas activity in areas of recent seismicity, the Commission had implemented a traffic light approach with regard to the existing three SWD wells to proceed with injection into the Arbuckle under a yellow light in that system. Because of the location of the existing SWD wells within six miles of a seismic cluster, various cautionary measures would be taken in connection with the disposal of fluids requested by the pending applications under an Interim Order. The Interim Order would provide for the taking of bottom hole pressures with a tool run in the well every 60 days and reporting on a weekly basis showing daily pressures and injected volumes. The witness acknowledged that the information requested by the Staff would help analyze the relationship, if any, between disposal and seismicity.

The ALJ ignores the testimony of the UIC witness and wrongfully presumes the witness could not make a recommendation because he lacked sufficient information to review. The witness made recommendations to help the Commission oversee the disposal operations in an area of previous reported seismicity. The UIC witness is very well informed as noted by the ALJ in his findings in page 12, paragraph 24 of the Report. The ALJ is apparently

confusing the term "recommended" with "requested relief". AEW is "requesting the relief" sought in these three applications and presented substantial evidence to support that request. AEW's evidence included an expert petroleum engineer who "recommended" the granting of the same on certain terms and conditions.

The Commission's Technical department is not requesting the relief sought by AEW, but rather, reviewing the same to determine whether to oppose the relief sought, and if so, to "recommend" why the relief should not be granted or to offer recommendations to help the Commission monitor the disposal of saltwater if the requested relief is granted. No one, including the Commission Technical department, is protesting or objecting to the requested relief. None of the expert witnesses testifying in these causes recommended a denial of the relief requested, nor a continuance to gather more information.

9) The ALJ erred in finding that: "AEP's request for an increase in injection rates and pressures must be considered in light of the currently permitted demand upon the disposal capacity of the Arbuckle formation in Payne County." There is no evidence in the record of these causes that there is a capacity issue in the Arbuckle formation in Payne County. To the contrary, the reason the Arbuckle is used as a disposal formation is because of its unique characteristics and capacity to take high volumes of saltwater as previously discussed. This additional requirement of review is beyond the Commission's jurisdiction and has never been a condition to orders authorizing disposal into the Arbuckle in Payne County.

10) Finally, the ALJ erred in recommending that the AEW applications be continued until AEW provides the Commission with additional information.

AEW has been presented substantial evidence that the requested increase in pressure and rates will not increase formation pressure that might induce seismicity. In any event, the requirement imposes an unreasonable burden of proof on AEW to prove a negative which is an impossible burden.

AEW presented substantial evidence that there are no faults or pathways to faults of concern that would tend to cause a significant earthquake. The UIC exhibits and testimony in this cause supports AEW's position. In any event, the requirement imposes an unreasonable burden of proof on AEW to prove a negative which is an unreasonable burden.

11) AEW presented substantial evidence that there is no economic method of handling produced water other than disposal. Nevertheless, the request is irrelevant and unnecessary because the SWD wells in question are already permitted for disposal into the Arbuckle. The applications herein request an increase in rates and pressures of existing permitted SWD wells.

12) For the above reasons, AEW, requests the Commission to not adopt the filed Report of the ALJ in this cause and that the Commission enter an Interim Order in these causes authorizing the increase in pressure and rates in the existing SWD wells as requested under the recommendations made by AEW and UIC,

THE ALJ FOUND:

1) It is a seminal public policy of the Commission to protect human health and the environment. This responsibility must take priority over all the other regulatory responsibilities to prevent waste and protect correlative rights with respect to oil and gas production. For this purpose the Commission has jurisdiction under 17 O.S Section 52(A)(i) over the handling and disposition of produced water and other deleterious substances associated with oil and gas extraction and transportation activities. The Commission is also obligated to prevent pollution and protect human health and the environment under various statutes and rules including 52 O.S. Section 139 and OCC-OAC 165:10-7-2. The Commission has promulgated rules for the location, installation and operation of SWD wells that are intended to protect human health and the environment.

2) See 17 O.S. Section 52(A)(i) which states that the Commission shall have jurisdiction over: "the handling, transportation, storage and disposition of saltwater, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, producing and operating of oil and gas wells." See 52 O.S. Section 139 which states that "The Corporation Commission is vested with exclusive jurisdiction, power and authority, and it shall be its duty, to make and enforce such rules and orders governing and regulating the handling, storage and disposition of saltwater, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, producing, and operating of oil and gas wells and brine wells within this state as are reasonable and necessary for the purpose of preventing the pollution of the surface and subsurface waters in the state, and to otherwise carry out the purpose of this act." See OCC-OAC 165:10-7-2(c)(8)(9) and (10) which state that the Commission has jurisdiction over "(8) The handling, transportation, storage and disposition of saltwater, drilling fluids, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, production, and operation of oil and gas wells at any facility or activity specifically subject to Commission jurisdiction or other oil and gas extraction facilities and activities. (9) Spills of deleterious substances associated with facilities and activities specified in O.A.C. 165:10-7-4(c)(8) or otherwise associated with oil and gas extraction and

transportation activities. (10) Groundwater protection for activities subject to the jurisdictional areas of environmental responsibility of the Commission."

3) These rules and statutes related to Class II UIC wells have primarily focused on protecting the groundwater and surface waters from pollution related to SWD wells. They have not specifically considered the issue of induced seismicity related to such wells because the threats posed by induced seismicity are a relatively recent phenomena and the science linking oil and gas activity to induced seismicity has not been settled conclusively. The authority of the Commission to investigate and address the risks of harm to human health and the environment arising from induced seismicity; however, is implicitly found in other rules and statutes related to analogous activities and explicitly found in the federal rules and statutes under which the Federal UIC program requirements were delegated to the states.

4) Under 17 O.S. Section 302 entitled Release of Hazardous Substances - Public Policy, the Legislature directed the Commission to protect the public health, safety, welfare, the state's economy and the environment from the harmful effects of activities related to deleterious substances:

The Legislature finds that the release of hazardous substances and petroleum from storage tanks into the surface water, groundwater, air and subsurface soils of this state poses a potential threat to the natural resources, health, safety and welfare of the residents of this state and to the economy of this state.

Therefore the Legislature declares it is the public policy of this state to protect the public health, safety, welfare, the state economy and the environment from the potential harmful effects of storage tanks used to store hazardous substances and petroleum. In order to implement this policy, it is the intent of the Legislature to establish a program for the regulation of storage tank systems.

5) The above statute applies to storage tank systems and such tanks and systems are often used as a part of a Class II underground injection operation. The petroleum and hazardous substances referred to in the statute are regulated substances that encompass the kinds of deleterious fluids that could be disposed of in a Class II UIC well.

6) See 17 O.S. Section 303.35 which states that a "Storage tank system" means a closed-plumbed system including, but not limited to, the storage tank(s), the lines, the dispenser for a given product, and a delivery truck that is connected to the storage tank system. See 17 O.S. Section 303.37 which states that a "Storage tank" means a stationary vessel designed to contain an accumulation of regulated substances which is constructed of primarily non-earthen materials that provide structural support. See OCC-OAC 165:10-1-2. Definitions in which "Deleterious substances" means any chemical, salt water, oil field brine, waste oil, waste emulsified oil, basic sediment, mud, or injurious substance produced or used in the drilling, development, production, transportation, refining, and processing of oil, gas and/or brine mining. The statute expressly states that it is the public policy of the Commission to address potential threats to the natural resources, health, safety and welfare of the residents of the state and to the economy of this state and such potential threats would clearly include threats and risks posed by induced seismicity.

7) In a similar vein, the Commission is authorized to issue orders necessary to protect property, human health and safety, and the environment with respect to the risks and hazards associated with above ground storage tanks. See OCC-OAC 165:26-1-26(a) which states that "The Commission will issue orders as necessary to enforce the provisions of this Chapter to protect property, human health and safety, and the environment." Under the accepted legal principle of in pari materia, the public policy of the Commission set forth for the regulation of storage tanks should extend to the regulation of Class II UIC wells and systems, since both sets of statutes and rules have a common purpose and comparable subject matter.

8) OCC-OAC 165:10-5-9 also authorizes the Commission to revoke the permits of disposal wells for just cause or lapses. The Commission may modify, vacate, amend or terminate any order granting underground injection upon its own initiative if information related to the operation of a SWD well indicates that the cumulative effects on the environment are unacceptable. Since the Commission has the authority to shut down an injection well because of information that the well may have an unacceptable environmental impact, it also has the authority to deny a permit to an applicant for the same reasons.

9) OCC-OAC 165:10-5-9 which states that "(a) Subject to 165:10-5-10, authorization of injection into enhanced recovery injection wells and disposal wells shall remain valid for the life of the well, unless revoked by the Commission for just cause or lapses and becomes null and void under the

provisions of 165:10-5-5(g). (b) An order granting underground injection may be modified, vacated, amended, or terminated during its term for cause. This may be at the Commission's initiative or at the request of any interested person through the prescribed complaint procedure of the Conservation Division. All requests shall be in writing and shall contain facts or reasons supporting the request. (c) An order may be modified, vacated, amended, or terminated after notice and hearing if: (1) There is a substantial change of conditions in the enhanced recovery injection well or the disposal well operation, or there are substantial changes in the information originally furnished. (2) Information as to the permitted operation indicates that the cumulative effects on the environment are unacceptable. (d) If an operator fails to complete or convert a well as approved by the Conservation Division within eighteen (18) months after the effective date of the order or permit authorizing injection into the well, then the order or permit authorizing injection into the well shall expire."

10) The EPA has delegated primary enforcement authority for the Federal UIC program through Part C of the Safe Drinking Water Act ("SWDA") to the State of Oklahoma. The State of Oklahoma has empowered the Commission to enforce the Federal UIC program related to Class II wells. See 40 C.F.R. Section 144.1(b)(1) which states that "The regulations in this part establish minimum requirements for UIC programs. To the extent set forth in part 145, each State must meet these requirements in order to obtain primary enforcement authority for the UIC program in that State." Commission actions under this delegation of authority shall be conducted in accordance with the federal requirements although nothing in the federal regulations precludes the state from adopting or enforcing requirements that are more stringent than the federal regulations. See 40 C.F.R. Section 145.1(f) which states that "Any State program approved by the Administrator shall at all times be conducted in accordance with the requirements of this part." See 40 C.F.R. Section 145.1(g)(1) which states that "Nothing in this part precludes a State from adopting or enforcing requirements which are more stringent or more extensive than those required under this part."

11) Under 40 C.F.R. Section 145.13, the EPA has delegated authority to the Commission to restrain any person from engaging in any activity which endangers or causes damage to public health or the environment. See 40 C.F.R. Section 145.13(a) which states that "Any State agency administering a program shall have available the following remedies for violations of State program requirements: (1) To restrain immediately and effectively any person by order or by suit in State court from engaging in any unauthorized activity which is endangering or causing damage to public health or environment." Because induced seismicity poses a real threat to public safety, the

Commission thereby has the authority under the SWDA to refuse to issue a permit to an applicant that fails to provide substantial evidence to the Commission that its SWD well will not endanger human health and the environment. The burden of proof falls upon the applicant to provide such substantial evidence to the Commission.

12) The Commission is also charged by law to regulate and abate public nuisance that arises from oil and gas activities. The case of *Union Texas Petroleum Corp. v. Jackson*, 909 P.2d 131 (Okl.Civ.App. 1995), held that "although the proper forum for a landowner to recover damages for nuisance caused by encroaching saltwater is in district court, the Commission may proceed to abate such 'nuisance', including assessment of liability therefore, in accordance with State statutes and court decisions, including the law of nuisance in order to enforce compliance with its rules and regulations."

13) See *Union Texas Petroleum Corp. V. Jackson*, supra, where the Court said that "A nuisance consists in unlawfully doing an act or omitting to perform a duty, which act or omission either annoys, injures or endangers the comfort, repose, health or safety of others or in any way renders other persons insecure in life or in the use of property. 50 O.S. 1991 § 1; *Cities Service Oil Company v. Merritt*, 332 P.2d 677, 684 (Okla. 1958). In *Cities Service*, the Supreme Court determined the basis of liability for injury or damage to property by pollution of subterraneous waters, from oil, gas or saltwater from oil wells, must be either negligence or nuisance. *Cities Service*, at 684. Cities or towns may seek abatement of a public nuisance, including protection of public water supplies, within their respective corporate limits in district court. 50 O.S. 1991 §§ 16, 17. A public nuisance is one which affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon the individuals may be unequal. 50 O.S. 1991 § 2; *Miller v. State*, 74 Okla. Crim. 104, 123 P.2d 699 (Okla.Crim.App. 1942). The remedies for public nuisance are through indictment or information, civil action, or abatement. 50 O.S. 1991 § 8. A public nuisance may be abated by any public body or officer authorized thereto by law. 50 O.S. 1991 § 11." Here the Court defined a nuisance as "unlawfully doing an act or omitting to perform a duty, which act or omission either annoys, injures or endangers the comfort, repose, health or safety of others or in any way renders other persons insecure in life or in the use of property."

14) Because public nuisance may encompass the harm and injury to human health and the environment that would result from a serious induced

seismicity event, the Commission has the authority to abate and assess the liability of any public nuisance related or potentially related to induced seismicity, and an applicant seeking a permit or a modification of a permit for a SWD well has a duty to provide all required information that would enable the Commission to assess the risk of public nuisance that could be caused by the SWD well.

15) The Commission is also empowered by law to prevent waste, a duty that ordinarily applies to the proper management and productive use of the state's hydrocarbon-bearing rock formations and reservoirs so that the maximum amount of oil and gas can be produced. Before the advent of oil and gas regulations such as the spacing statutes, reservoirs were often damaged by over-drilling and hydrocarbons were stranded in the earth. The spacing laws established drilling and spacing units that promoted the orderly development of the petroleum reservoirs and prevented waste of the natural resource.

16) The substantial increase in the production of hydrocarbons over the past seven years brought about by horizontal drilling in unconventional reservoirs has produced a corresponding increase in the production of saltwater. During this time, Oklahoma has also experienced an unprecedented rise in earthquake activity. According to a letter published on February 5, 2015 by the Oklahoma Office of the Secretary of Energy and Environment, Oklahoma experienced 585 earthquakes of a magnitude of 3.0 or greater in 2014, compared to 109 events recorded in 2013. To read the letter go to Earthquakes in Oklahoma (<http://earthquakes.ok.gov>) hosted by the Office of the Oklahoma Secretary of Energy and the Environment and follow the link to http://earthquakes.ok.gov/wp-content/uploads/2015/04/Coordinating_Council_Letter_to_Legislature.pdf.

17) Although the question of whether the disposal of saltwater by underground injection can induce seismicity has been subject to much debate over the past several years, the OGS recently determined that the majority of recent earthquakes in central and north-central Oklahoma are very likely triggered by the injection of produced water in disposal wells. OGS issued the following Summary Statement on Oklahoma Seismicity on April 21, 2015:

Based on observed seismicity rates and geographical patterns of migrating seismicity in Oklahoma, which follow major oil and gas plays with large amounts of produced water, these rates and patterns of seismicity are very unlikely to represent a naturally occurring

rate change and process. The rate of magnitude 3+ earthquakes has increased from 1½ per year prior to 2008 to the current average rate of 2½ per day, a rate that is approximately 600 times the historical background. The Oklahoma Geological Survey (OGS) considers it very likely that the majority of recent earthquakes, particularly those in central and north-central Oklahoma, are triggered by the injection of produced water in disposal wells. The primary source for suspected triggered seismicity is not from hydraulic fracturing, but from the injection/disposal of water associated with oil and gas production.

See http://earthquakes.ok.gov/wp-content/uploads/2015/04/OGS_Summary_Statement_2015_04_20.pdf

to read the Summary Statement on Oklahoma Seismicity dated April 21, 2015.

18) Because the underground injection of saltwater is now deemed to very likely trigger earthquakes, the disposal of the saltwater by underground injection has compromised the productive capacity of some of the state's disposal rock formations, such as the Arbuckle formation, in a manner analogous to what happened to the petroleum reservoirs before the advent of the spacing laws. Some areas of the Arbuckle formation are now designated "red" zones and cannot be used for disposal of fluids. Much larger areas of the Arbuckle are now "areas of interest" that soon may suffer the same fate. The Arbuckle formation is a valuable public natural resource used to dispose of hazardous wastes, mining wastes, radioactive wastes and other hazardous substances as well as the deleterious substances produced from oil and gas operations, and the loss of the productive disposal capacity of this formation will adversely affect the state's economy.

19) The Commission has the authority to prevent the continuing waste of the disposal capacity of the Arbuckle formation through management of the resource and restriction of the amount and location of fluid injected into the formation. Because the Arbuckle formation is a valuable public natural resource and not an unregulated dump, the current diminished disposal capacity of the formation mandates the implementation of conservation practices by both the Commission and the oil and gas industry so that the remaining disposal capacity of the formation can be preserved and maintained.

20) Conservation practices focus upon the orderly and sustainable development of a resource, and sustainable practices often entail an evaluation of all the alternatives to the intensive use of a resource. Here the oil and gas industry has already studied, evaluated and implemented many conservation practices for recycling and treating produced water, minimizing produced water production and optimizing the management of produced water through the use of pipelines, flowback water pits, water treatment operations and other related facilities throughout the state and in surrounding states. The Commission can thus prevent waste by requiring all applicants that seek permits for new SWD wells or seek permission to increase the injection rates of existing SWD wells in the Arbuckle complete detailed engineering and economic studies of the feasibility of alternate means of handling produced water other than disposal into the Arbuckle by injection wells. The applicants should submit such studies to the Commission to assist the Commission in the management and maintenance of the resource.

21) Applications for a permit to operate a SWD well or to seek an increase in injection rates and pressures are not enforcement actions. In an enforcement action taken in response to a complaint or an alleged violation of a statute or rule, the Commission has the burden of proof to establish by clear and convincing evidence that a respondent has committed the violation. The Commission's inspectors and technical experts often testify about the facts related to a violation and recommend actions to be taken.

22) In an application for a permit or for a modification of a permit, the applicant has the burden of proof to show that the operation of a SWD well will not harm human health and the environment. Here the Commission also has a responsibility to the regulated community to clearly define what rules must be followed and what evidence must be presented by an applicant that would enable the Commission's engineers and scientists to address the risks of induced seismicity presented by the operation of a SWD well. The rules related to the protection of the state's surface water and groundwater are clear and well-established but the evidentiary standards related to the risks of induced seismicity are evolving and are changing in response to new scientific studies on the topic and ongoing seismic activity.

23) In this present case, AEW presented substantial evidence that the Weathers SWD well, the Bode SWD well and the Hopkins SWD well comply with the Commission's rules to protect the waters of the state. AEW also implicitly acknowledged the risks and liabilities posed by the operation of the wells in a seismically-active area by amending its applications after the initial

hearing to initially operate the wells at a reduced rate. AEW pledged to develop seismic data and related data concerning the operation of the wells in the Arbuckle formation and share the information with the Commission.

24) During the hearing, however, the Commission's UIC expert who reviewed the application and AEW's plan of development could not recommend the increases in injection rates and surface pressures requested in the applications, indicating to the ALJ that the information submitted by AEW would not comprise sufficient information to allow UIC to make a recommendation about the risks of induced seismicity.

25) Because the Commission hasn't adopted any rules setting a minimum standard of review for an evidentiary hearing on induced seismicity, it is a difficult task for the ALJ to make a recommendation about the significance of any evidence presented in a hearing where the Commission's technical experts cannot make a recommendation. The Commission's ALJs are not retained as technical experts by the Commission and cannot testify as technical experts but must rely upon the opinions and testimony of the experts representing an applicant and the Commission when they weigh the evidence and make their independent recommendations.

26) Without rules or a recommendation from the Commission's technical experts, an ALJ runs the risk of acting in an arbitrary and capricious manner. In the absence of such rules and technical recommendations, the ALJ must then look to other objective and credible authorities for guidance in weighing the evidence.

27) The NTW report, decision model and recommendations for evaluating the potential for injection-induced seismicity represent the kind of authority that can be relied upon by the ALJ and the Commission. The NTW report thus serves as a set of acceptable and clearly presented considerations that can be used to identify the information that should be presented to the Commission by an applicant.

28) The NTW report confirmed that the following components are necessary for significant injection-induced seismicity: (1) sufficient pressure buildup from disposal activities characterized by an increase in formation pore pressure; (2) faults of concern (denoting faults or zones of multiple faults optimally oriented for movement and located in a critically stressed region and of sufficient size

and possessing sufficient accumulated stress / strain, such that fault slip and movement has the potential to cause a significant earthquake); and (3) a pathway allowing the increased pressure to communicate with the fault. The report found that understanding the geologic characteristics of a site is an essential step in evaluating the potential for injection-induced seismicity and that the "application of basic petroleum engineering practices coupled with geology and geophysical information can provide a better understanding of reservoir and fault characteristics."

29) According to the NTW report, Petroleum engineering methodologies provide practical tools for evaluating the three key components that must all be present for induced seismicity to occur: (1) sufficient pressure buildup from disposal activities, (2) a Fault of Concern, and (3) a pathway allowing the increased pressure to communicate from the disposal well to the fault.

Specifically, petroleum engineering methods typically focus on the potential for reservoir pressure buildup and the reservoir flow pathways present around a well and at a distance, and characterize reservoir behavior during the well's operation. Petroleum engineering approaches enhance geological and seismological interpretations related to the characterization of faults and flow behavior.

The petroleum engineering approach incorporates information typically collected from the permit application (well construction and completion data) and data on injection volumes and pressures reported for compliance purposes during operation of the well. This information is presented in a graphical format to illustrate behavior of the well over time. These graphs are compared to graphs of expected well behavior from various reservoir behavior models to identify anomalous patterns.

Operational analysis consists of plotting readily available data reported as part of the Class II disposal well permit compliance. These plots include: 1) Injection volumes and wellhead pressures; 2) Bottomhole injection pressure gradient; and 3) Hall integral and derivative. Plotting injection volumes and pressures in an appropriate format along with operating pressure gradients may highlight significant changes in disposal well behavior. The operating gradient plot can indicate whether a disposal well is operating above fracture gradient. The Hall integral and derivative plot utilizes operating data to characterize a well's long term hydraulic behavior by providing a long-term, long distance look into the disposal zone...Changes in Hall integral and

derivative trends can represent reservoir heterogeneities (i.e., faults, stratigraphic changes, etc.), changes in completion conditions, reservoir boundaries, and effects of offset wells.

Supplemental evaluations may be performed but require data or logs that may or may not be routine for Class II disposal permit activities. These evaluations quantitatively assess potential pathways and potential reservoir pressure buildup and may include the following: 1) Step rate tests; 2) Pressure falloff tests; 3) Production logs; and 4) Static reservoir pressure measurements. Step rate tests are used to determine the formation parting pressure (fracture extension pressure). The quality of the data analysis is dependent on the amount of pressure data recorded during the test. Pressure falloff tests can provide the completion condition of the well (wellbore skin) and reservoir flow characteristics. Production logs typically include temperature logs, noise logs, radioactive tracer surveys, oxygen activation logs or spinner surveys. These types of logs are used to evaluate the fluid emplacement at the well. Periodic static pressure measurements provide an assessment of reservoir pressure buildup.

30) Based upon the NTW report, AEW has to provide significant evidence to the Commission that the components found necessary for significant injection-induced seismicity by the NTW are not present in the Arbuckle and Reagan formations and the Granite basement rock in the vicinity of the SWD wells. The kind and type of evidence (i.e., 3-D seismic studies, reservoir pressure and volume calculations, bottomhole pressure measurements, Hall integral and derivative data and other operating data from nearby SWD wells such as those shown in Exhibit 12) are to be determined by the technical experts working for AEW and the Commission.

31) The need for significant and substantial evidentiary standards for assessing the risks of induced seismicity related to the operation of underground injection wells is timely in light of the recent OGS position that that the majority of the recent earthquakes in central and north-central Oklahoma are very likely triggered by the injection of produced water. Tim Baker, the Director of the Oil and Gas Division of the Commission, Oklahoma Corporation Commission, recently disclosed to the public statistical information about disposal well volumes and the number of incidents of induced seismicity for several counties in Oklahoma. The disposal well volumes for 2011, 2012 and 2013 for Alfalfa, Grant Garfield, Noble, Pawnee, Logan, Payne, Oklahoma and Lincoln Counties are shown in Appendix D of the

ALJ Report. The number of earthquake incidents for 2011, 2012, 2013 and 2013 for the same counties are shown in Appendix E of the ALJ Report.

32. See Other Resources - Oklahoma Corporation Commission Townhall Presentation on Seismicity/Updates to the Traffic Light System taken from a public presentation made by Tim Baker, Director of the Oil and Gas Division of the Commission, that is displayed on a website entitled Earthquakes in Oklahoma (see <http://earthquakes.ok.gov>) hosted by the Office of the Oklahoma Secretary of Energy and the Environment, that launched on or around April 21, 2015 at http://earthquakes.ok.gov/wp-content/uploads/2015/04/OGCD_Presentation.pdf.

33) The estimated disposal well injection volumes by county in 2012 and 2013 and the estimated number of earthquake incidents in 2013 and 2014 by county are recast for comparison in Appendix F of the ALJ Report. The ALJ estimated the injection volumes and number of earthquake incidents from a visual inspection of the graphs shown in Appendices D and E. The data tables used to create the graphs were not available for the ALJ to review. The comparison appears to show a trend between an increase in disposal well injection volumes between 2012 and 2013 and an increase in the number of earthquake incidents in 2013 and 2014 in Alfalfa, Grant Garfield, Noble, Pawnee, Logan and Payne Counties. The comparison also appears to show a trend between a decrease in the disposal well injection volumes between 2012 and 2013 and a decrease in the number of earthquake incidents in 2013 and 2014 in Oklahoma and Lincoln Counties.

34) The data from Appendix D and Appendix E appeared to show that the disposal well injection volumes increased 57% between 2012 and 2013 and the number of earthquake incidents increased 303% between 2013 and 2014 in Payne County. The counties adjacent to Payne County appeared to show similar trends. Logan County disposal well injection volumes increased 64% between 2012 and 2013 and the number of earthquake incidents increased 1,437% between 2013 and 2014. Noble County disposal well injection volumes increased 61% between 2012 and 2013 and the number of earthquake incidents increased 2,175% between 2013 and 2014. These trends are a cause for concern in this present case because AEW proposes to increase the injection volumes for three SWD wells in Payne County. The trends may become more apparent when the injection volume data for 2014 and the earthquake incident data for 2015 are available for comparison.

35) The cause for concern is heightened because the increase in the number of earthquake incidents in Payne County may not reflect the permitted demand upon the disposal capacity of the Arbuckle formation that is currently authorized by the Commission. As shown in Appendix C of the ALJ Report, the Commission has permitted the disposal of 506,985,000 barrels of saltwater per year in an area located around the proposed SWD wells but these wells only disposed of 19,532,732 barrels of saltwater in 2013. The actual disposal rate was only around 3.85% of the permitted disposal rate.

36) If the data shown in Appendix C is representative of the disposal activity in all of Payne County and the findings of the OGS are correct, then the utilization of less than 5% of the permitted disposal capacity in Payne County may be related to an increase in seismic activity. If all of the operators of disposal wells in Payne County were to utilize all of their permitted disposal capacity, then the rate of seismic activity may significantly increase above the amount recorded for 2013. AEW's request for an increase in injection rates and pressures must be considered in light of the currently permitted demand upon the disposal capacity of the Arbuckle formation in Payne County. A recommendation to allow AEW's applications must be based upon a review of substantial and significant evidence that increasing the injection rates and pressures for the SWD wells will not harm human health and the environment.

37) The evidence must be sufficient in scope and quality such that the UIC experts can either recommend that the SWD wells be permitted to operate or not, or acknowledge that the evidence is presently not available or capable of being determined. The ALJ notes that if sufficient evidence cannot be found or determined to meet this minimum standard of review, then AEW will not be able to meet the burden of proof that the increase in injection rates and pressures proposed for the Weathers SWD well, the Bode SWD well and the Hopkins SWD well will not harm human health and the environment.

38) After taking into consideration all of the facts, circumstances, evidence and testimony presented in both causes, it is the recommendation of the ALJ that the hearing concerning AEW's applications be continued until such time that AEW can provide the Commission with the following information:

- a) Significant and substantial evidence that the Arbuckle formation in the area of the B&W Weathers SWD Well, the Bode SWD Well and the Hopkins SWD

Well are not experiencing pressure buildup from disposal activities characterized by an increase in formation pore pressure that is likely to induce seismicity or that the operation of the wells would not cause such a buildup of reservoir pressure;

b) Significant and substantial evidence that there are no faults of concern (denoting faults or zones of multiple faults optimally oriented for movement and located in a critically stressed region and of sufficient size and possessing sufficient accumulated stress/strain, such that fault slip and movement has the potential to cause a significant earthquake). The area of review should comprise the area shown on Exhibit 11, or in the alternative, an area recommended by the UIC staff;

c) Significant and substantial evidence that there are no pathways allowing any increased pressure to communicate with the faults of concern;

d) Detailed engineering and economic studies of the feasibility of alternate means of handling produced water other than disposal into the Arbuckle by injection wells, including: trucking water to other disposal wells located outside of the zone of interest encompassing a "yellow" zone; piping water to other disposal wells located outside of the zone of interest encompassing a "yellow" zone; recycling the water for reuse in the area; and treating the water to reduce its volume or improve its quality for a beneficial use other than disposal. The engineering and economic studies should enable the Commission to compare the costs for each option.

POSITIONS OF THE PARTIES

AEW

- 1) **Charles L. Helm**, attorney, appearing on behalf of AEW, is asking the Court to modify the ALJ Report with the recommendation of an Interim Order, based upon the recommendations by both AEW and the UIC department of the Commission. AEW does not want the Report of the ALJ to be adopted by the Commission for several reasons.
- 2) The above captioned causes involve a request to the Commission to allow three existing permitted SWD wells to be authorized to have their injection/pressure rates increased. These SWD wells are in compliance with Commission rules.
- 3) AEW has committed substantial resources, such as manpower, time and money, to the area development in and around Payne County, Oklahoma.
- 4) AEW has acquired a large acreage position in this area. AEW is currently in a substantial drilling and development program targeting the Woodford and Mississippian formations, which produce lots of water.
- 5) AEW, through acquisition, has acquired the holdings of B&W Operating,, who had permitted these three existing SWD wells. These SWD wells are equipped to prevent any endangerment to the treatable water and to avoid any pollution or any adverse impact on this treatable water.
- 6) AEW notes when B&W obtained approval for these three SWD wells, the Hopkins SWD well, Bode SWD well and Weathers SWD well, B&W were in the early development stages, with very few wells that were capable of utilizing these wells.
- 7) AEW has drilled many horizontal wells that are targeting the water producing zones of the Woodford and Mississippian. It became clear to AEW that with AEW's development plans for the area that the injection/pressure rates initially had for these B&W wells was insufficient for AEW's purposes. Because of these reasons, AEW filed the above captioned applications to increase those injection rates/pressures.
- 8) AEW realizes the Commission has a new policy with regard to disposal area that may have some seismicity or earthquake activity present in order to monitor the filing of any disposal applications. This policy requires a hearing rather than the traditional method where UIC administratively approved any disposal applications due to the recent earthquakes in the State.

9) AEW notes the Commission also looks at stress fractures that may be within a disposal area.

10) AEW points out there is no issue with regard to stress fractures in the above captioned causes. AEW believes the request for the hearing was due to the recent seismicity in the Payne County area. AEW asserts that the hearing was not had due to indications of problems based on faulting or stress fractures being present.

11) AEW met with the UIC staff and followed the normal procedural requirements for such disposal applications. AEW notes the Commission generally wants a significant review had by the UIC department on each filed disposal application before issuing any final orders. AEW believes this is so the UIC can go over the particulars of each application to assist in making recommendations to the ALJ who will reside over future hearings on disposal applications.

12) AEW notes that after meeting with the UIC department on the captioned applications, AEW reduced their injection/pressure requests accordingly. The Hopkins SWD well was requested to be allowed an Interim order for 180 days at a rate of 10,000 BWPD for 90 days, and thereafter, the rate would go to 20,000 BWPD for the remaining 90 days. AEW requested for both the Bode SWD well and Weathers SWD well that these be allowed to produce no more than 20,000 BWPD for the 180 day Interim order period. AEW notes that the initial injection rates/pressures filed had been reduced due to discussions and meeting with the UIC staff prior to the merit hearing before the ALJ.

13) AEW took recommendations of the UIC staff about other particulars which resulted in changes to the well designs herein.

14) AEW notes Exhibit 12 is an copy of Exhibit 10 showing about 45 SWD wells on a larger scale with about 17 operators having obtained disposal approval. The AEW wells are shown in bold and currently approved at the 5,000 per day rate.

15) If one reviews this exhibit, one well has been permitted 100,000 BWPD with others ranging from 20,000 to 50,000 BWPD. Devon, a competitor, has been authorized 17 disposal orders in this Arbuckle area, six at 25,000 BWPD and 11 at 50,000 BWPD. AEW points that all these companies listed on Exhibit 12 have been granted disposal relief from the Commission.

16) AEW cannot keep up with the potential development in this area with its current 5,000 BWPD restriction. AEW finds that one disposal well facility can accommodate 15 horizontal wells so AEW is targeting its request for increased rates and pressure it needs so that AEW can accommodate the

drilling of 15 horizontal wells. AEW believes this would allow the owners of the oil and gas rights/minerals to obtain the largest ultimate recovery of oil for each of the sections these SWD wells have been drilled in.

17) AEW notes 52 O.S. Section 86.2 mentions the Commission has a statutory mandate/duty to prevent the waste of recoverable oil. It defines "waste" as meaning anything that unreasonably interferes with obtaining the largest ultimate recovery of oil.

18) AEW's position here is if one can't have disposal facilities in near proximity to horizontal wells, then one cannot develop these recoverable reserves. AEW asserts unless there is a commercial means to dispose of water then this would create waste. Without such means to recover the oil reserves here, AEW would never be able to obtain these oil reserves from these certain sections.

19) AEW needs to balance the rights and correlative rights of all of the operators, mineral owners, royalty owners, working interest owners and all those who are trying to develop these oil reservoirs. At the same time AEW notes that the protection of the treatable water and the rights of surface owners in the area of operations must be considered.

20) AEW notes at the February 5, 2015 hearing before the ALJ there were no objections or protests. AEW presented an expert engineer in support of their relief requests. The Commission expert, Mr. Charles Lord, testified as an oil and gas specialist, whom is now responsible to oversee seismicity in the State of Oklahoma.

21) AEW has existing horizontal wells that are ready to produce, however, AEW cannot produce them due to the current rates in place for these three SWD wells.

22) AEW filed a Motion to Re-open at the end of March, 2015 in hopes of presenting additional data to the ALJ in order to get a quicker decision. This Motion was granted, to which AEW said it would provide some additional information concerning the area faulting and 3-D seismic. The record was re-opened on April 10, 2015, where AEW presented that information, with the ALJ filing his written report on May 11, 2015.

23) AEW notes the ALJ now wants more evidence to provide to the UIC department so their experts may make a recommendation as to AEW's requested applications. The ALJ apparently wants UIC to make a recommendation, one way or the other, of approval or denial of these applications. If not that, then Technical department needs to go on the record and state that such evidence the ALJ wants is unavailable.

24) AEW believes the ALJ has placed the burden of AEW's application, upon AEW, to go out and perform studies, deliver same to UIC department to persuade them to get more involved in deciding if their applications can be granted.

25) AEW finds the ALJ's recommendations here are in excess of the Commission's current jurisdiction regarding SWD wells. Further, AEW notes that such is based upon documents that fall outside the record in these causes.

26) AEW thinks that such reliance on documents outside of the record is a significant violation of due process with regard to AEW's right to a fair trial and a fair judicial proceeding.

27) AEW reminds the Court it has been working with the Commission and the Technical department in order to provide necessary information for them to determine, if any, causal effects that might be occurring from disposal activities and earthquakes.

28) AEW does not wish to conduct operations that will cause earthquakes yet AEW is spending over \$1.5 million on disposal wells in hopes of drilling future horizontal wells that will cost over \$2 million.

29) AEW has provided seismic data to the Commission as requested. AEW also had sent brokers out trying to purchase 3-D seismic in the hopes that such data would satisfy the ALJ upon the reopened hearing date. At the re-opening hearing AEW did introduce evidence that there wasn't any 3-D seismic concerning these properties.

30) AEW also provided injection and pressure rates on a daily basis on all of the wells it currently operates, to which the Commission has recommended such under the terms and conditions of the Interim order in these causes.

31) AEW believes that is why the UIC has implemented the traffic light system in order to get all the information available to help determine whether there is any causal effects between a particular SWD well and / or a particular earthquake(s).

32) AEW believes it is an unreasonable assumption to say earthquakes are being caused because of disposal wells in the vicinity, as this would suggest that all SWD wells in the State of Oklahoma are creating earthquakes. This is an unreasonable assumption. AEW asserts this assumption is what the ALJ concluded in his reviewing data outside of the record.

33) AEW thinks the ALJ wants a county-wide review of seismicity/earthquakes and then compare that with the large area over the

years, all because of a website he examined after the record was closed. AEW notes this website wasn't posted until 11 days after the end of the merit hearing, yet the ALJ bases much of his decision on this website.

34) AEW asserts the UIC did make a recommendation in these applications by making a request for Interim orders. The UIC department recommended that AEW plug back the Hopkins SWD well to get 100 feet higher in the reservoir to avoid the granite, which is a possible earthquake site. AEW has already complied with such request. The UIC Staff's request to monitor the pressures and rates has been complied with by AEW.

35) AEW went beyond the Commission rules with additional testing requirements per UIC's requests.

36) AEW noted in its appeal that the Commission has a duty to the regulated community to clearly define what rules must be followed and what evidence must be presented by an applicant that would enable the Commission's engineers and scientists to address the risks of induced seismicity presented by the operation of a SWD well.

37) AEW notes the ALJ now is forcing AEW to convince the UIC's Staff and requesting the Commission to set up a set of rules laying out what type of evidence must be presented for UIC Staff to make recommendations in SWD filings. AEW reminds the Court the ALJ stated "he couldn't make a recommendation, presumably because he doesn't have sufficient information to review upon which to make a decision."

38) AEW asserts the above ALJ statement is contrary to the UIC department's position, whom are remaining neutral by choice, rather than by virtue of lacking sufficient data by AEW in which to make a decision to approve their applications.

39) AEW notes the ALJ stated that "During the hearing, however, the Commission's UIC expert, who reviewed the application and AEP's (sic) plan of development, could not recommend the increases in injection rates and surface pressures requested in the applications, indicating to the ALJ that the information submitted by AEP (sic) would not comprise sufficient information to allow the UIC Department to make a recommendation about the risks of introduced seismicity."

40) It appears to AEW that the ALJ is attempting to create a standard that the approval process for SWD wells should fall back to the UIC, as it has been in the past, and not be left for the ALJs to decide such matters. This way the Commission requires from the applicant the desired data for approval prior to it being before the ALJ.

41) AEW believes this assumption carries throughout the ALJ's Report. AEW asserts that the ALJ's misconception of the UIC's position here, has led to errors in his conclusions.

42) AEW recalls in most cases that UIC normally presents an expert witness to testify with regard to SWD facilities that have seismicity issues, yet here the UIC has decided to remain neutral.

43) AEW notes an AEW decision recently in Cause PD 201400224 which created Order No. 642055 on June 17, 2015, granting disposal into the Arbuckle under an Interim order for 180 days, providing for a scaled injection rate of 15,000 for the first 60 days, 20,000 for the next 60 days and 25,000 for the last 60 days.

44) AEW reminds the Court that the Commission stated in Order No. 642055 that "The UIC neither opposes or supports the application for disposal in the Dalmation saltwater disposal number one well....The Commission staff takes a neutral position regarding the requested relief."

45) AEW believes this is important due to the exceptions before the Commission now. The Commission issued an order two days before this decision, that they rendered in the ARP Oklahoma, LLC matter, to remand the exceptions to the Referee. AEW's point here is that the Commission was aware of the ALJ's recommendations and the filed exceptions, yet two days later the Commission granted a similar order wherein the Commission states it is remaining neutral.

46) AEW believes the above has been the position of the Commission all along on SWD wells. AEW is unaware of any standard/test that should be used to determine whether a disposal application should be granted for increased injection rates.

47) However, AEW believes there is a procedure outlined in the Commission rules that is clear to the industry, which is not vague and clearly tells an applicant what one needs to do.

48) AEW notes by virtue of the Commission's request, all disposal applicant/operators must proceed first with the UIC department to eliminate any potential problems or the appearance of causing and/or inducing any seismicity or earthquakes.

49) AEW believes that the ALJ's recommendations appear to be based almost entirely on information outside the record, i.e. the posting of an Oklahoma website regarding seismicity that came online April 21, 11 days after the hearing had been closed. AEW notes this outside information covers a significant amount of the ALJ's written report, with most of the appendixes

except for "C" and "F" attached to the Report coming from this outside information. AEW stresses this information comes from outside of the court record, which violates fundamental due process.

50) AEW believes decisions should be made based upon the evidence presented at the time of the hearing. AEW notes Black's Law dictionary shows that evidence is generally any type of proof or probative matter that is legally presented at the trial on the issue before the Court, and to be used by witnesses or used as documents to help the trier of fact with a decision.

51) AEW asserts that the ALJ going to these websites after the record was closed was improper. AEW believes if the ALJ had felt strongly about the AEW applications the ALJ could have requested the record be re-opened for more evidence. AEW finds the ALJ took about 22 pages of his Report to suggest that the Commission lacks any real procedure with regard to seismicity issues and that the UIC department has no basis/position with regard to AEW's applications and the ALJ wishes that changed by his tone and his tenure as an ALJ.

52) AEW submits to the Court that all of the "a." through "d" additional requests the ALJ has requested were addressed in this hearing, with evidence already presented on them. AEW submits the evidence here is substantial, credible and by the experts on both sides. AEW asserts there is no need to go outside of the record to seek further information before approving AEW's applications herein. AEW believes the record in this cause can be reviewed to find that AEW presented substantial evidence to support their disposal applications.

53) AEW points out that there is no threat to the freshwater here by AEW's request to increase the injection rates and pressures.

54) AEW notes the ALJ says there is actually no evidence in this record that would suggest that increasing the injection rate on any of these SWD wells would likely induce or increase seismicity. AEW agrees. AEW notes that none of the experts testified that increased rates here would induce seismicity. AEW asserts there was no presented evidence to the contrary in the record.

55) AEW believes it is clear from the record here there is not a reasonable assumption that AEW being granted an increase of injection rates similar to or in line with nearby operators in the area, could cause, or reasonably be expected, to induce seismicity.

56) AEW is only focusing on the three captioned wells where the ALJ is focusing upon the State of Oklahoma and how the ALJ perceives such to be an earthquake problem for the state. AEW notes if one just narrows the issue to the three AEW wells in these causes, it is much easier to deal with. AEW

believes that increasing the pressure of these three wells is not going to cause or reasonably presume to cause any induced seismicity.

57) AEW notes there is seismicity in the Payne County, though the magnitudes vary compared with the surrounding counties. AEW knows the Commission and the ALJ is aware of the various studies and exhibits and the fact that the Commission is monitoring those areas closely.

58) AEW notes there is no huge magnitude in the area that could cause major concern here as the evidence shows some smaller magnitude seismicity and clusters throughout this area of the State.

59) AEW notes its witness, Mr. Dick, pointed out that there are lots of areas where there is seismicity without the presence of injection or disposal activities going on and then there are some areas with much drilling and development via horizontal wells and there is no seismicity present. AEW asserts that seismicity can occur where there is no oil and gas activity and places where one would not think would be a quake prone area. AEW submits that just because there is a lot of injection activity in a vicinity does not mean there is a correlation with lots of seismicity present.

60) AEW notes the record is free from any evidence that seismicity is going to be increased by AEW's injection rates/pressures being increased or being decreased.

61) AEW believes that allowing these three SWD wells an additional increase in injection rate/pressure will not have any impact on the recent seismicity events and earthquakes.

62) AEW asserts the presented evidence with regard to the Arbuckle being a reservoir that would be good for disposal is a reasonably well known fact.

63) AEW notes the ALJ however, adds as one of the additional requirements that somehow AEW potentially could reduce the use of the Arbuckle for injection by allowing new wells to be permitted or by increasing rates on older SWD wells. The ALJ implies that the Arbuckle is full and unable to accept any more disposal water. AEW disagrees that adding more water will ruin a natural resource of the State of Oklahoma, i.e. the disposal capacity of the Arbuckle which the State is trying to protect.

64) AEW asserts there was no evidence in the record to suggest such harm. AEW finds it beyond any type of reasonable review to attempt to calculate what the Arbuckle, in these counties of the State, might hold.

65) AEW believes the evidence here is such a minute part of the Arbuckle's capacity that such an increase in rates on these three SWD wells will have no impact at all (see Exhibit 12).

66) AEW is merely wanting to increase injection rates by 5,000 BWPD for the Hopkins SWD well and 15,000 BWPD for the remaining two wells. Per Exhibit 12, there is approximately 5 million barrels of water per day being injected. AEW submits it is not doing anything to harm the capacity of the Arbuckle as a disposal facility.

67) AEW notes the ALJ also mentions the Arbuckle might have productive capacity. AEW disagrees that what AEW is wanting to do here will impact any potential production from the Arbuckle.

68) AEW notes there is no evidence in the record as to faulting and that any faults shown does not mean that such will cause earthquakes.

69) AEW does have a disposal well in the vicinity of two faults shown on the exhibits, yet there is no real significant seismicity in this area. AEW notes that the further away you get distance wise from the faults, there are areas of clusters where there is seismicity present.

70) AEW notes the ALJ asked the experts "What about these faults? I see these faults. Aren't you concerned about having wells in proximity to the faults?" Mr. Lord, the UIC expert, testified that these faults weren't "stress" faults, and UIC was not concerned about just faulting.

71) AEW agrees that just because there is faulting present does not mean that it can go through layers and layers of reservoir to draw the fluids down into the granite area.

72) AEW notes that such has to have some stress, some fracturing and some method which would result in these faults becoming problems.

73) The reason for the hearing here was due only to seismicity being present. There is no record evidence of faulting, yet AEW notes the ALJ wants additional faulting evidence in order to prove a negative factor, that such is not connected to the seismicity issues. AEW believes that such is an unreasonable request from the ALJ.

74) AEW notes the 3-D seismic shows almost between the three wells herein, there is no evidence of faulting that would cause any induced seismicity.

75) AEW believes the record is clear in that regard that there doesn't need to be any additional information as there are no stress faults present.

76) AEW believes in order for these properties to be developed there needs to be an opportunity to dispose of the produced water. AEW notes the ALJ is asking for additional information in order to show why one can't do something else with this produced water, yet AEW addressed this in the record.

77) AEW presented evidence that it costs \$.50 per barrel to currently dispose of produced water in the AEW's existing facilities from the wells which AEW has drilled. At \$.50 per barrel rate, this would make the development of the Mississippian and Woodford formations reasonable. AEW notes the ALJ still wants to know what AEW can do to further dispose of this produced water.

78) AEW's evidence showed that one can truck the water to a commercial facility at about \$4 per barrel, which is uneconomical. AEW believes this would shut down drilling in the whole area if injection water was required to go to a commercial disposal facility.

79) AEW notes it was asked about alternatives to trucking the produced water, and AEW could have done so two townships away to AEW's other facilities. AEW notes it cannot lay pipeline from the three SWD wells through two townships and pipe it over, as it is uneconomical and impractical to acquire easements and right-of-way, etc over that distance.

80) AEW notes the ALJ asked about "treating processes where you can recycle, or retreat the water and place it back into the ground. AEW notes that much of the rules on horizontal drilling came from the Barnett Shale area in the south part of Texas. The operators of the Barnett Shale have research on line which the ALJ could have easily found concerning the subject of treating the produced water and re-disposing such. AEW notes at the end of the day it costs about \$10 a barrel, which is not a reasonable, economical alternative.

81) AEW believes AEW has presented substantial and credible evidence to support its request for these three SWD wells to have their injection rates increased, without any reasonable probability that they will induce seismicity. AEW notes these wells are safe to the environment, to human health and will not cause any problems to the treatable water of the State of Oklahoma.

82) AEW requests that the Referee not adopt the ALJ's Conclusions to continue the causes, but would request that an Interim order increasing the pressures and rates on these existing wells as per the UIC recommendation be granted.

COMMISSION

1) Susan Conrad, Deputy General Counsel, appearing for the UIC department, stated that Mr. Lord testified that the Staff was neutral regarding the AEW applications.

CONCLUSIONS

The Referee finds the Report of the Administrative Law Judge should be affirmed in part and reversed in part.

1) The Referee affirms the ALJ's recommendation "that the hearing concerning [AEW's] applications be continued until such time that [AEW] can provide the Commission with the following information:

a. Significant and substantial evidence that the Arbuckle formation in the area of the B&W Weathers SWD Well, the Bode SWD 1-2 Well and the Hopkins SWD 1-32 Well are not experiencing pressure buildup from disposal activities characterized by an increase in formation pore pressure that is likely to induce seismicity or that the operation of the wells would not cause such a buildup of reservoir pressure;

b. Significant and substantial evidence that there are no faults of concern (denoting faults or zones of multiple faults optimally oriented for movement and located in a critically stressed region and of sufficient size and possessing sufficient accumulated stress / strain, such that fault slip and movement has the potential to cause a significant earthquake). The area of review should comprise the area shown on Exhibit 11, or in the alternative, an area recommended by the UIC staff;

c. Significant and substantial evidence that there are no pathways allowing any increased pressure to communicate with the faults of concern;"

2) The Referee reverses the ALJ's recommendation that AEW provide the Commission with the following information:

d. Detailed engineering and economic studies of the feasibility of alternate means of handling produced water other than disposal into the Arbuckle by injection wells, including: trucking water to other disposal wells located outside of the zone of interest encompassing a "yellow" zone; piping water to other disposal wells located outside of the zone of interest encompassing a "yellow" zone; recycling the water for reuse in the area; and treating the water to reduce its volume or improve its quality for a beneficial use other than disposal. The engineering and economic studies should enable the Commission to compare the costs for each option.

The Referee agrees with AEW that said requests are unreasonable. Also, such a requirement is irrelevant and unnecessary in determining whether or not the Hopkins SWD well, the Bode SWD well and the Weathers SWD well should be authorized at AEW's proposed increased injection rates and pressures by the Commission, which are the subjects of the present applications by AEW.

3) 17 O.S. Section 52(A)(1)(i) provides:

A. 1. Except as otherwise provided by this section, the Corporation Commission is hereby vested with exclusive jurisdiction, power and authority with reference to:

i. The handling, transportation, storage and disposition of saltwater, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, producing and operating of oil and gas wells,...

4) 52 O.S. Section 139(A) provides;

A. The Corporation Commission is vested with exclusive jurisdiction, power and authority, and it

shall be its duty, to make and enforce such rules and orders governing and regulating the handling, storage and disposition of saltwater, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, producing, and operating of oil and gas wells and brine wells within the state as are reasonable and necessary for the purposes of preventing the pollution of the surface and subsurface waters in the state, and to otherwise carry out the purpose of this act.

5) OCC-OAC 165:10-7-2(c)(8)(9) and (10) provides:

(c) Specific areas of Conservation Division jurisdiction to which Pollution Abatement rules apply:

* * *

(8) The handling, transportation, storage and disposition of saltwater, drilling fluids, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, production, and operation of oil and gas wells at any facility or activity specifically subject to Commission jurisdiction or other oil and gas extraction facilities and activities.

(9) Spills of deleterious substances associated with facilities and activities specified in OAC 165:10-7-4(c)(8) or otherwise associated with oil and gas extraction and transportation activities.

(10) Groundwater protection for activities subject to the jurisdictional areas of environmental responsibility of the Commission.

6) OCC-OAC 165:10-5-9(a)(b)(c)(d) provides as follows:

(a) Subject to 165:10-5-10, authorization of injection into enhanced recovery injection wells and disposal wells shall remain valid for the life of the well, unless revoked by the Commission for just cause or

lapses and becomes null and void under the provisions of 165:10-5-5(g).

(b) An order granting underground injection may be modified, vacated, amended, or terminated during its term for cause. This may be at the Commission's initiative or at the request of any interested person through the prescribed complaint procedure of the Conservation Division. All requests shall be in writing and shall contain facts or reasons supporting the request.

(c) An order may be modified, vacated, amended, or terminated after notice and hearing if:

(1) There is a substantial change of conditions in the enhanced recovery injection well or the disposal well operation, or there are substantial changes in the information originally furnished.

(2) Information as to the permitted operation indicates that the cumulative effects on the environment are unacceptable.

(d) If an operator fails to complete or convert a well as approved by the Conservation Division within eighteen (18) months after the effective date of the order or permit authorizing injection into the well, then the order or permit authorizing injection into the well shall expire.

7) The Oklahoma Court of Civil Appeals in *Union Texas Petroleum Corp. v. Jackson*, 909 P.2d 131 (Okl.Civ.App. 1995) provides:

A nuisance consists in unlawfully doing an act or omitting to perform a duty, which act or omission either annoys, injures or endangers the comfort, repose, health or safety of others or in any way renders other persons insecure in life or in the use of property. 50 O.S. § 1; *Cities Service Oil Company v. Merritt*, 332 P.2d 677, 684 (Okla. 1958). In *Cities Service*, the Supreme Court determined the basis of liability for injury or damage to property by pollution of subterraneous waters, from oil, gas or saltwater from

oil wells, must be either negligence or nuisance. *Cities Service*, at 684. Cities or towns may seek abatement of a public nuisance, including protection of public water supplies, within their respective corporate limits in district court. 50 O.S. 1991 §§ 16, 17. A public nuisance is one which affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon the individuals may be unequal. 50 O.S. 1991 § 2; *Miller v. State*, 74 Okla. Crim. 104, 123 P.2d 699 (Okla. Crim. App. 1942). The remedies for public nuisance are through indictment or information, civil action, or abatement. 50 O.S. 1991 §8. A public nuisance may be abated by any public body or officer authorized thereto by law. 50 O.S. 1991 § 11.

8) The Referee agrees with the ALJ's findings and statements in paragraph #142 on page 18 of his ALJ Report which stated:

142. In an application for a permit or for a modification of a permit, the applicant has the burden of proof to show that the operation of a SWD well will not harm human health and the environment. Here the Commission also has a responsibility to the regulated community to clearly define what rules must be followed and what evidence must be presented by an applicant that would enable the Commission's engineers and scientists to address the risks of induced seismicity presented by a SWD well. The rules related to the protection of the state's surface water and groundwater are clear and well-established but the evidentiary standards related to the risks of induced seismicity are evolving and are changing in response to new scientific studies on the topic and ongoing seismic activity.

9) The Referee agrees with the conclusion of the ALJ that AEW presented substantial evidence that the Weathers SWD well, the Bode SWD well and the Hopkins SWD well comply with the Commission rules to protect the waters of the State. The Referee listened to the audio of the testimony given by the UIC expert Mr. Charles Lord at the hearing. Mr. Lord was asked whether the UIC department was taking any position regarding the relief sought by AEW in

these applications and he stated "not as it pertains to seismicity." Mr. Lord testified that all of the seismic data is obtained from the OGS. The ALJ noted in his Report that Mr. Lord was a member of the EPA's Underground Injection Control NTW that provided a decisive model and recommendations for evaluating the potential for injection-induced seismicity. The NTW issued a report in November 2014. The report's complete description is *Minimizing and Managing Potential Impacts of Injection-Inducing Seismicity from Class II Disposal Wells: Practical Approaches*, Underground Injection Control National Technical Workgroup, U.S. Environmental Protection Agency, Washington, D.C., Draft: December 24, 2013 and revised: November 24, 2014.

10) The NTW report as stated by the ALJ, provides practical tools for evaluating the "three key components that must all be present for induced seismicity to occur: (1) sufficient pressure buildup from disposal activities, (2) a Fault of Concern, and (3) a pathway allowing the increased pressure to communicate from the disposal well to the fault" ALJ Report, footnote 24, page 19. The Referee would agree with the conclusion of the ALJ that the hearing should be continued so that AEW can provide significant evidence to the Commission based upon the components found by the NTW report for evaluating the potential for injection-induced seismicity.

11) The Referee agrees with the ALJ that Mr. Lord as a Technical expert and representative of the UIC department took no position concerning the seismicity and was neutral regarding the subject applications. Concerning the risk posed by the Hopkins SWD well, the Bode SWD well and the Weathers SWD well with respect to induced seismicity, the Referee agrees with the ALJ that the UIC department would require more/sufficient information provided by AEW based upon the NTW's decision model and recommendations for evaluating the potential for injection induced seismicity. The UIC department then would perhaps be able to review such information and make a decision as to the risk posed by the Hopkins SWD well, the Bode SWD well and the Weathers SWD well with respect to induced seismicity.

12) The weight of the evidence established that the manner and method proposed by the ALJ pursuant to the NTW's decision model and recommendations for evaluating the potential for injection induced seismicity would comply with and exceed the Commission's rules to protect human health and the environment. The ALJ is the finder of fact and it is the ALJ's duty to observe the demeanor of the witnesses, assess their credibility and assign the appropriate weight to their opinions. *Application of Choctaw Express Company*, 253 P.2d 822 (Okl. 1953); *Palmer Oil Corporation v. Phillips Petroleum Company*, 231 P.2d 997 (Okl. 1951); *Haymaker v. Oklahoma Corporation Commission*, 731 P.2d 1008 (Okl.Civ.App. 1986).

13) Based upon the above stated reasoning, rules and law, the Report of the ALJ should be affirmed in part and reversed in part as stated above.

RESPECTFULLY SUBMITTED THIS 13th day of August, 2015.



Patricia D. MacGuigan

OIL & GAS APPELLATE REFEREE

PM:ac

xc: Commissioner Anthony
Commissioner Murphy
Commissioner Hiett
James L. Myles
ALJ David D. Leavitt
Charles L. Helm
Susan Conrad
Michael L. Decker, OAP Director
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