EXHIBIT 2: PETITION

Re: *Lisa West and Stormy Hopson, Individually and as Class Representatives v. ABC Oil Company, Inc., et al.*, Case No. CJ-2016-49, Pottawatomie County District Court, State of Oklahoma

IN THE DISTRICT COURT OF POTTOWATOMIE COUNTY
STATE OF OKLAHOMA

LISA WEST, and
STORMY HOPSON,
Individually and as Class Representatives,

Plaintiffs,

vs.

ABC OIL COMPANY, INC.,
BEREXCO, LLC,
CHAPARRAL ENERGY, LLC,
FAIRFIELD OIL & GAS CORP.,
GUINN COMPANY,
HEMBREE A. W. COMPANY,
LEASEHOLD MANAGEMENT CORP.,
NEW DOMINION, LLC,
NEWELL OIL AND GAS, LLC,
OKLA. OIL & GAS MANAGEMENT, INC.,
ONSHORE ROYALTIES, LLC,
PHOENIX OIL & GAS, INC.,
BILLY JACK SHARBER OPERATING, LLC,
SULLIVAN AND COMPANY, LLC, and
TRANSPO ENERGY, LLC,

Defendants.

Case No CJ-16-49

PETITION

1. Plaintiffs, Lisa West and Stormy Hopson ("Plaintiffs"), individually and on behalf of a proposed plaintiff class of Oklahoma property owners, bring this action against ABC Oil Company, Inc., Berexco, LLC, Chaparral Energy, LLC, Fairfield Oil & Gas Corp., Guinn Company, Hembree A. W. Company, Leasehold Management Corp., New Dominion, LLC, Newell Oil and Gas, LLC, Oklahoma Oil & Gas Management, Inc., Onshore Royalties, LLC, Phoenix Oil & Gas, Inc., Billy Jack Sharber Operating, LLC, Sullivan and Company, LLC, and Transpo Energy, LLC (collectively "Defendants") and a proposed defendant class of other

companies operating in injection wells seeking relief regarding purchase of insurance policies needed because of Defendants' injection of wastewater into the Arbuckle formation has induced or triggered earthquakes and will continue to do so for some time even if injection wells were immediately stopped.

2. Unlike prior cases filed in Oklahoma, the present action does not seek to recover damages per se. Rather, the present action seeks injunctive relief associated with the need for the class to purchase earthquake insurance being caused by Defendants' conduct. Plaintiffs seek injunctive relief regarding the costs of purchasing earthquake insurance. The injunctive relief requested is prospective, Plaintiffs ask the Court to order Defendants to pay earthquake premiums as they are incurred in the future; and the injunctive relief requested is also retrospective. Plaintiffs ask the Court, analogous to the equitable awarding of back wages in an employment case, to award back insurance premiums.

3. Also, unlike prior cases filed in Oklahoma, the present action seeks certification of a defendant class as well as a plaintiff class. There are hundreds of companies that have operated injection wells in Oklahoma over the relevant time frame. One of these companies, or even a significant number of them, arguably cannot bear the ongoing financial consequences associated with earthquakes caused by injection wells. Frankly, given the current price of oil and projections for its pricing throughout the remainder of 2016 and beyond, it is unclear if the entire industry will be able to bear the financial burdens associated with its decisions on how to operate injection wells.[1] Earthquakes in the high 6 magnitude have generated billions in insured losses.

[1] See, e.g., "Is Sandridge Energy, Inc. Close to Crumbling," *Washington Times*, Sarah Terry-Cobo, November 15, 2015; "Can This Oil Baron's Company Withstand Another Quake," *Bloomberg Businessweek*, Benjamin Elgin and Matthew Phillips, April 23, 2015 (questioning New Dominion, LLC's financial viability in view of its exposure to earthquake liability). Regarding the outlook for oil going forward, see "Oil Prices: What's Behind the Drop? Simple Economics," *New York Times*, Clifford Krauss, updated February 16, 2016 (citing industry sources that indicate the price of oil is likely to stay low through 2016 and even beyond).

4. A defendant class is also preferable to fairly apportion liability for the insurance premiums incurred by Oklahoma property owners, and ensure that they can secure the injunctive relief to which they are entitled, it will be necessary to include all of the liable parties as a class of defendants. If all contributors to the problem are included, their percentage of fault and liability can be more fairly assessed and spread among all the parties causing the problems.

5. This case frames the liable parties as those operating the injection wells, and they are the ones who are directly responsible. It is possible that the class of injection well operators named herein (which has some overlap with the production companies, some of which operate their own injection wells), may desire to seek contribution, indemnification, or some other type of relief from the companies that produced the water reinjected by the well operators. However, the liability of the producers is arguably secondary to the liability of the parties that were responsible for its actual injection into deep wells that have caused the earthquakes.

6. Other pending cases seek recovery of property damage previously incurred by Oklahoma property owners as a result of earthquakes. There are cases filed in multiple Oklahoma counties including:

a. Lincoln County - *Ladra v. New Dominion, et al.* (CJ-2014-115); and *Cooper v. New Dominion, et al.* (Case No. CJ-2015-24);

b. Logan County - *Griggs v. Chesapeake, et al.* (Case No. CJ-2016-6); and

c. Oklahoma County – *Felts et al. v. Devon Energy et al.* (Case No. CJ-2016-137)[2]

7. A federal action was recently filed by the Sierra Club against Chesapeake Operating, LLC; Devon Energy Production Co. LP; and New Dominion, LLC (Federal Court for

[2] *Felts* filed in Oklahoma County seeks injunctive relief of an unspecified nature, but from the context the relief appears to relate to reducing the environmental risks posed by the named defendants' conduct.

the Western District of Oklahoma, filed February 16, 2016).[3] The Sierra Club seeks specific injunctive relief under the Solid Waste Disposal Act, amended as the Resource Conservation and Recovery Act, 42 U.S.C. §6901, *et seq.* ("RCRA") regarding injection volumes and monitoring of seismic activity, relief that is generally not available in Oklahoma State courts since those functions are within the exclusive jurisdiction of the Oklahoma Corporation Commission under Oklahoma state law.[4]

INTRODUCTION

8. Oklahoma experienced earthquakes before Defendants started deep saltwater injection. From 1882 – 2008 earthquakes were primarily located in south-central Oklahoma in and around a small projection west from Garvin County that looks like a truncated panhandle. This area is where four counties are in close proximity: Garvin, Grady, McClain and Stephens. See Figure 1.[5] Keep in mind that the quakes represented in Figure 1 represent earthquakes occurring over a 120-year period.

9. From 2008 - 2013 new areas of earthquake activity lit up. See Figure 2. These new earthquake areas overlapped with locations where oil and gas companies had started injecting massive quantities of saltwater into deep wells completed into the Arbuckle formation. See Figure 3 showing overlap of oil producing fields with new earthquake areas.

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[3] Sandridge Energy was named in the Sierra Club / Public Justice's October 29, 2015 "intent to sue" letter, but it was not named as a defendant in the action filed February 16, 2016. The same counsel involved in the *Griggs* case in Logan County, Oklahoma are involved in the federal case on behalf of the Sierra Club / Public Justice.

[4] *Ladra v. New Dominion, LLC*, 2015 OK 53, ¶¶9-11; 353 P.3d 529.

[5] "Potential for Induced Seismicity in Oklahoma and Recent Cases," Austin Holland, November 11, 2013, then research seismologist with Oklahoma Geological Survey

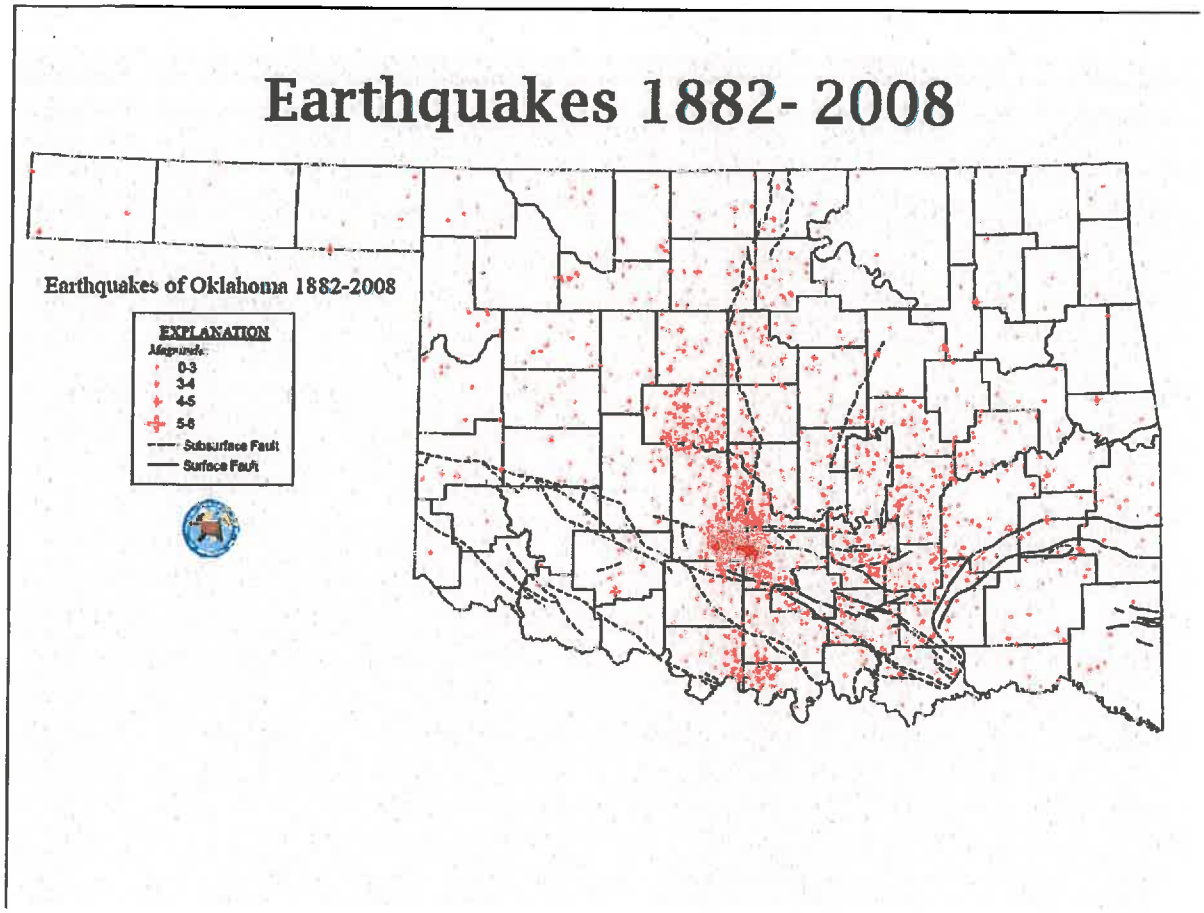

Figure 1: Historical Earthquakes

10. The data shown in Figures 1 – 3 was presented by Austin Holland in November 2013. Holland was then a research seismologist with the Oklahoma Geological Survey ("OGS"). Holland worked day-to-day at the University of Oklahoma where the OGS has its headquarters.

11. Holland's 2013 presentation-and the strong link it demonstrated between earthquakes and wastewater injection-got noticed by the oil and gas industry.

> In November 2013, Austin Holland, Oklahoma's state seismologist, got a request that made him nervous. It was from David Boren, president of the University of Oklahoma, which houses the Oklahoma Geological Survey where Holland works…asked Holland to his office for coffee with Harold Hamm, the billionaire founder of Continental Resources, one of Oklahoma's largest oil and gas operators. Boren sits on the board of Continental, and Hamm is a big donor to the

university, giving $20 million in 2011 for a new diabetes center. Says Holland: "It was just a little bit intimidating."[6]

Holland is the master of understatement: sitting down with his boss -- former senator, OU President, and Oklahoma legend -- David Boren and billionaire Harold Hamm for coffee was a "just a little bit intimidating."

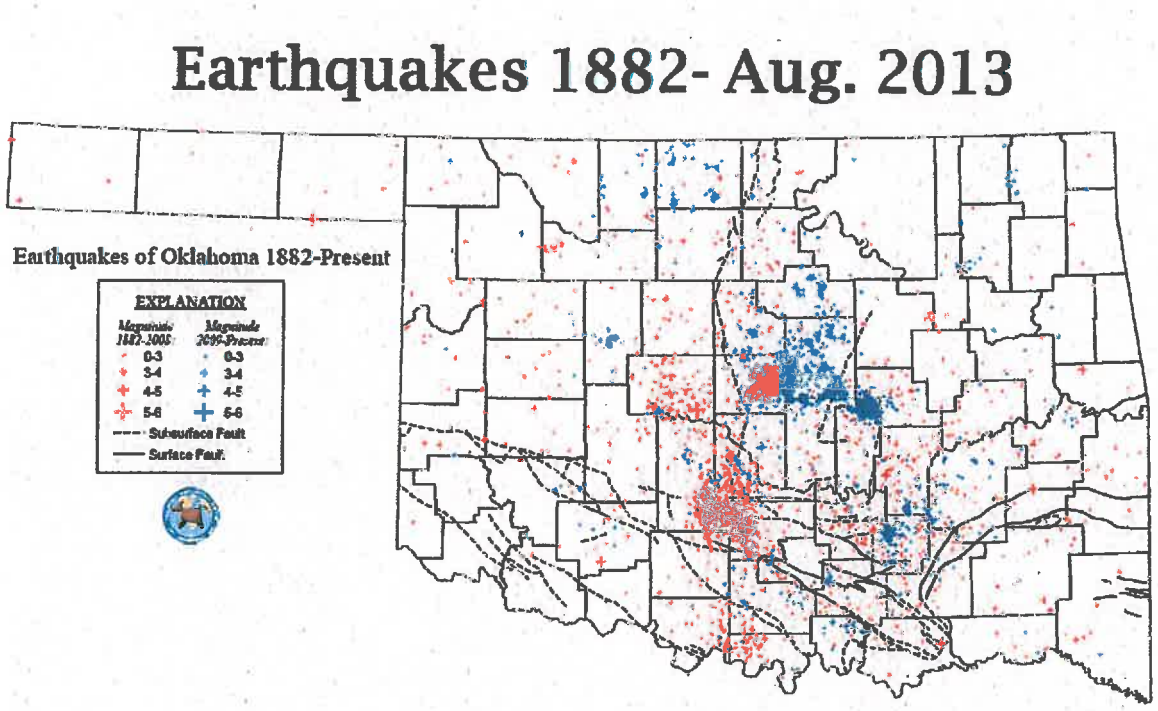

Figure 2: Blue Are New Earthquake Areas After 2008

[6] "Big Oil Pressured Scientists over Fracking Wastewater's Link to Quakes," Benjamin Elgin and Matthew Phillips, Bloomberg Business, March 30, 2015. Note that the title of this article is misleading since the most of the wastewater being injected is not from fracking. See Fig. 6 from "Oklahoma's Recent Earthquakes and Saltwater Disposal, Science Advances," F. Rall Walsh, III and Mark D. Zoback, Jan. 10, 2016 ("hydraulic fracturing flow-back water comprises an extremely small fraction of the injection… nearly all the water being injected into SWD wells in these areas is produced water" not from fracking).

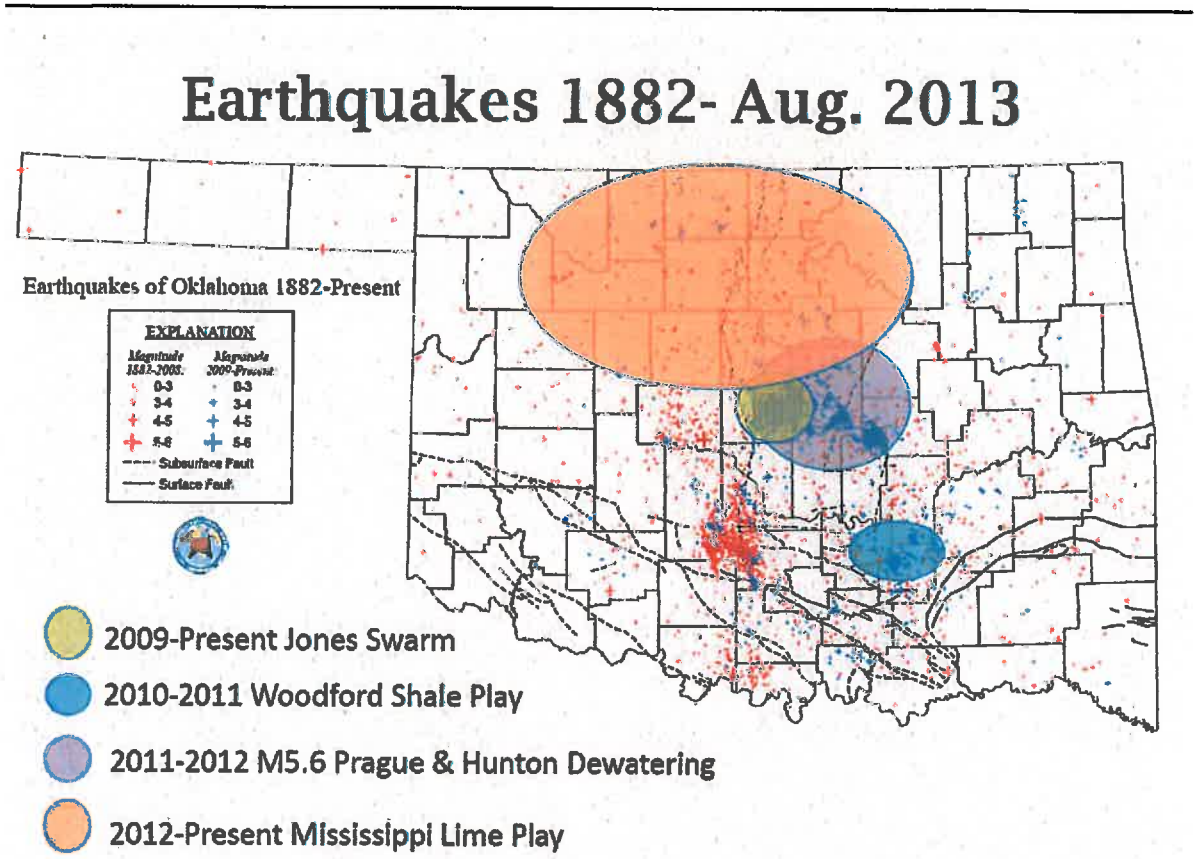

Figure 3: Overlap of Recent Oil Plays with New Earthquake Areas

12. Not surprisingly, Holland's honesty cost him his job at OGS. By July 6, 2015 it was reported that Holland was leaving the OGS for a job in New Mexico.[7] He did not accuse Boren, Hamm, or any other oil and gas-affiliated persons of undue pressure nor did he allege that his departure had anything to do with his billionaire coffee klatch. He did not need to.

13. The contrast between the scientific bases for Plaintiffs' claims as compared to the defenses that have been publicly made by Defendants or their proxies are stark. "***Wastewater***

[7] "Oklahoma's Top Seismologist Accepts USGS New Mexico Job," Paul Monies, *Oklahoman*, July 6, 2015.

injection," says Bill Ellsworth, a seismologist at the U.S. Geological Survey, "***is undoubtedly responsible for the majority of these earthquakes***."[8] In contrast, Defendant New Dominion's former CEO and one of its founders, David J. Chernicky,, summarized the Defendants' position thus:

> If humans can cause an earthquake, then they "can probably fart and shift the orbit of the planet, too." He adds: "Man does not cause tsunamis in Japan. Man did not cause the volcanic blast at Krakatoa. And man does not cause earthquakes."[9]

14. Chernicky's opinions are not an isolated case. They were, and to some extent remain, the standard response of the oil industry. "The science is not clear," or "it is a complicated issue," or some other form of obfuscatory statement is the norm. Chad Warmington, President of the Oklahoma Oil and Gas Association, as recently as April 21, 2015, was still denying the obvious: "There may be a link between earthquakes and disposal wells, but we – industry, regulators, researchers, lawmakers or state residents – still don't know enough about how wastewater injection impacts Oklahoma's underground faults."[10] Warmington went on to assert that "there is no scientific evidence that stopping wastewater injection would result in fewer earthquakes."

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[8] "Can This Oil Baron's Company Withstand Another Quake," *Bloomberg Businessweek*, Benjamin Elgin and Matthew Phillips, April 23, 2015 (emphasis added). William L. Ellsworth is listed as a "scientist emeritus" with the U.S. Geological Survey and Professor of Geophysics at Standford's School of Earth, Energy & Environmental Sciences. See https://earth.stanford.edu/william-ellsworth and http://earthquake.usgs.gov/regional/nca/directory/?id=57.

[9] *Id.* David J. Chernicky's background is summarized by *Bloomberg Business* online at http://www.bloomberg.com/research/stocks/people/person.asp?personId=47615303&privcapId=225670127. Chernicky's assertion is contrary to well-accepted science. For example, as long ago as 1968 an article was published in the respected journal Science connecting injection of fluids into a deep well with triggered earthquakes. "The Denver Earthquakes: Disposal of Waste Fluids by Injection into a Deep Well Has Triggered Earthquakes Near Denver, Colorado," *Science*, J.W. Healy, W.W. Rubey, D.T. Griggs, C.B. Raleigh, Sept. 27, 1968 (Vol. 161, No. 3848).

[10] Press release from Oklahoma Oil and Gas Association dated April 21, 2015. Available online at http://okoga.com/wp-content/uploads/2015/04/PR-Reponse-OGS-Report.pdf.

15. This is a class action lawsuit brought by Oklahoma residents who own real property in Oklahoma for which they have either purchased earthquake insurance or for which they desire to purchase such insurance, but have been unable to afford to do so. Plaintiffs, on behalf of themselves and a class of others similarly situated seek to recover for premium payments made by them to purchase earthquake insurance and, on a going-forward basis ask for temporary and permanent injunctive relief requiring Defendants and a class of other injection well operators to reimburse the class for earthquake insurance premiums as they are incurred.

16. Many members of the class, including but not limited to the named plaintiffs, have suffered damage caused by injection-induced earthquakes, but this action does not seek to recover directly for damages caused thereby. As noted above, multiple class actions are pending that address those claims. Rather, this case only relates only to past and future payment of earthquake insurance premiums.

DEFENDANTS

17. The Oklahoma Corporation Commission ("OCC") provides public information relevant to this case including, but not limited to, the following databases: (1) Operator's Directory, current as of January 15, 2016 online at http://www.occeweb.com/og/R97OPER.pdf, which includes operators name, operator number, address, and contact persons; and (2) UIC Injection Volumes 2014 available online at http://www.occeweb.com/og/ogdatafiles2.htm. From the latter database, a compilation of the injection volumes from 2012 – 2014 for Pottatwatomie County was developed, and that spreadsheet is the source of injection volumes noted herein. The information in paragraphs discussing Defendants was derived from the above-noted sources.

18. Defendant ABC Oil Company, Inc. is OCC Op. No. 19055 with offices at 910 Lamar St., PO Box 1469, Wichita Falls, TX 76307-1469. From 2012 to 2014 ABC operated at least one injection well in Pottawatomie County and injected in that time frame circa 5,119,720 BBLs of wastewater.

19. Defendant Berexco, LLC is OCC Op. No. 22550 with offices at 2020 N. Bramblewood St., Wichita KS 67206-1094. It shares offices with Beren Corporation, which is OCC Operator No. 4055. From 2012 to 2014 Berexco operated at least one injection well in Pottawatomie County and injected in that time frame circa 6,653,758 BBLs of wastewater.

20. Defendant Chaparral Energy, LLC is OCC Op. No. 16896 with offices at 701 Cedar Lake Blvd, Oklahoma City, OK 73114-7800. From 2012 to 2014 Chaparral operated at least one injection well in Pottawatomie County and injected in that time frame circa 7,876,473 BBLs of wastewater.

21. Defendant Fairfield Oil & Gas Corp. is OCC Operator No. 2910 and has offices at 300 NW 70th St., Oklahoma City, OK 73116-7804. From 2012 to 2014 Fairfield operated at least one injection well in Pottawatomie County and injected in that time frame circa 5,400,000 BBLs of wastewater.[11]

22. Defendant Guinn Company is OCC Operator No. 13231 and has offices at 45251 Turkey Hill Rd, Asher, OK 74826-6012. From 2012 to 2014 Fairfield operated at least one

[11] Fairfield Oil & Gas Corp. illustrates a curiosity in the data on injection wells. Each of its wells had the exact same injection volume and the exact same injection pressure for each month from 2012 to 2014. Even if an operator tried to accomplish that level of precision, it would have been impossible. Fairfield also illustrates the importance of later parsing out what formations injection was made into. Two wells operated by Fairfield (well names "Jo Ann" and "MG") injected into the Hunton formation, another into the Simpson Dolomite, and a final well injects into the Arbuckle. As discussed elsewhere, the scientific evidence shows that earthquakes are induced or triggered predominantly by injection into the Arbuckle formation, which is located just above the crystalline basement. Therefore, regarding apportionment of fault as among the Defendants, the zone into which injection is accomplished may need to be accounted. Volumes injected from 2012 to 2014 are: into the Hunton, Jo Ann 1,620,000 BBLs and MG 108,000; into the Simpson Dolomite 1,512,000; and into the Arbuckle 2,160,000.

injection well in Pottawatomie County and injected in that time frame circa 5,400,000 BBLs of wastewater.

23. Defendant Hembree A. W. Company is OCC Operator No. 998 and has offices at 1501 N. Shawnee St., PO BOX 1725, Shawnee, OK 74804-1725. From 2012 to 2014 Hembree operated at least one injection well in Pottawatomie County and injected in that time frame circa 4,981,622 BBLs of wastewater.

24. Defendant Leasehold Management Corp. is OCC Operator No. 17592 and has offices at 1141 S.E. Grand Boulevard, Suite 101, Oklahoma City, OK 73129-6708. From 2012 to 2014 Leasehold Management Corp. operated at least one injection well in Pottawatomie County and injected in that time frame circa 5,670,000 BBLs of wastewater.

25. Defendant New Dominion, LLC is OCC Operator No. 20585 and has offices at 1307 S. Boulder Ave., Suite 400, Tulsa OK 74119-3220. From 2012 to 2014 New Dominion operated at least one injection well in Pottawatomie County and injected in that time frame circa 15,629,932 BBLs of wastewater.

26. Defendant Newell Oil and Gas, LLC is OCC Operator No. 21892 and has offices at 35431 Hardesty Road, Shawnee, OK 74801-5753. From 2012 to 2014 Newell operated at least one injection well in Pottawatomie County and injected in that time frame circa 5,195,000 BBLs of wastewater.

27. Defendant Oklahoma Oil & Gas Management, Inc. ("OOGM") is OCC Operator No. 17016 and has offices at 300 NW 70th St., Oklahoma City, OK 73116-7804. From 2012 to 2014 OOGM operated at least one injection well in Pottawatomie County and injected in that time frame circa 10,829,626 BBLs of wastewater.

28. Defendant Onshore Royalties, LLC is OCC Operator No. 23326 and has offices at 3501 S. Texas Ave., Suite 300, PO Box 2326, Victoria, TX 77902-2326. From 2012 to 2014 Onshore operated at least one injection well in Pottawatomie County and injected in that time frame circa 8,874,972 BBLs of wastewater.

29. Defendant Phoenix Oil & Gas, Inc. is OCC Operator No. 10952 and has offices at 35863 Highway 270, PO Box 1859, Seminole, OK 74818-1859. From 2012 to 2014 Phoenix operated at least one injection well in Pottawatomie County and injected in that time frame circa 56,697,887 BBLs of wastewater.

30. Defendant Billy Jack Sharber Operating, LLC is OCC Operator No. 21553 and has offices at 35585 EW 1270 (Seminole), PO Box 71, Konowa, OK 74849-0071. From 2012 to 2014 Billy Jack operated at least one injection well in Pottawatomie County and injected in that time frame circa 4,530,752 BBLs of wastewater.

31. Defendant Sullivan and Company, LLC is OCC Operator No. 20952 and has offices at 1437 S. Boulder Ave., Suite 1200, Tulsa, OK 74119-3636. From 2012 to 2014 Sullivan and Company operated at least one injection well in Pottawatomie County and injected in that time frame circa 5,544,712 BBLs of wastewater.

32. Defendant Transpro Energy, LLC is OCC Operator No. 22297 and has offices at 1818 W. Lindsey St., Suite A105, Norman, OK 73069-4160. From 2012 to 2014 Transpro operated at least one injection well in Pottawatomie County and injected in that time frame circa 6,372,758 BBLs of wastewater.

33. The volumes of wastewater injected by each Defendant are shown in Table 1. Defendant Phoenix injects, by far, the largest volumes. It injected more than a quarter of the total volume injected county-wide in the 2012 to 2014 timeframe. The fifteen named Defendants represent 77% of the injected volume from 2012 to 2014. There are circa 97 operators in Pottawatomie County, so the remaining 80 or so operators represent under one-quarter of the total injection volume from 2012 to 2014.

Phoenix	56,697,887	28.3%
New Dominion	15,629,932	7.8%
OOGM	10,829,626	5.4%
Onshore	8,874,972	4.4%
Chaparral	7,876,473	3.9%
Berexco	6,653,758	3.3%
Transpro	6,372,758	3.2%
Leasehold Mgmt	5,670,000	2.8%
Sullivan and Co.	5,544,712	2.8%
Fairfield	5,400,000	2.7%
Newell	5,195,000	2.6%
ABC	5,119,720	2.6%
Guinn	4,981,622	2.5%
Hembree	4,981,622	2.5%
Billy Jack Sharbe	4,530,752	2.3%
SUB-TOTAL	154,358,834	77.0%
TOTAL	200,415,419	

Table 1: Injection by Defendants, BBLs and % of Total for Pottowatomie County

PLAINTIFFS

34. Plaintiff Lisa West suffered property damage to her home in the large Prague 2011 earthquake and made a claim against her earthquake insurance. Her claim was eventually paid, but no one has reimbursed Plaintiff West for the premiums she incurred and which she will continue to incur as a result of earthquakes induced by Defendants' activities.

35. Plaintiff Stormy Hopson resides in Pottawatomie County, Oklahoma at 16 Limousin Lane, Shawnee, OK 74084. Hopson would like to purchase earthquake insurance, and she believes that it is needed based on the increased rate of earthquakes in her area.

However, due to her other financial commitments, purchase of earthquake insurance has not been practical. Plaintiff Hopson believes that the earthquakes caused by Defendants' activities have resulted in property damage to her home. She worries what will happen to her largest investment, her home, if a big earthquake causes significant damage to her home.

JURISIDICTION AND VENUE

36. Jurisdiction and venue in this Court are proper. This Court has personal jurisdiction over Defendants who inject wastewater in the State of Oklahoma, more specifically within Pottawatomie County.

37. Venue is proper because a substantial part of the events or omissions giving rise to the claims set forth in this Petition occurred in Pottawatomie County, Plaintiffs and many of the Defendants reside in Pottawatomie County, and many injection wells operated by Defendants are in Pottawatomie County.

38. The OCC does not have jurisdiction over the claims asserted herein consistent with the holding in *Ladra v. New Dominion, et al.*, 2015 OK 53, 353 P.3d 529.

TECHNICAL BACKGROUND

39. Recent earthquakes in Oklahoma are induced or triggered by Defendants' injection wells, primarily by produced water injected into the Arbuckle Formation. Figure 4 illustrates a leading scientific model for how the injected water induces or triggers quakes.

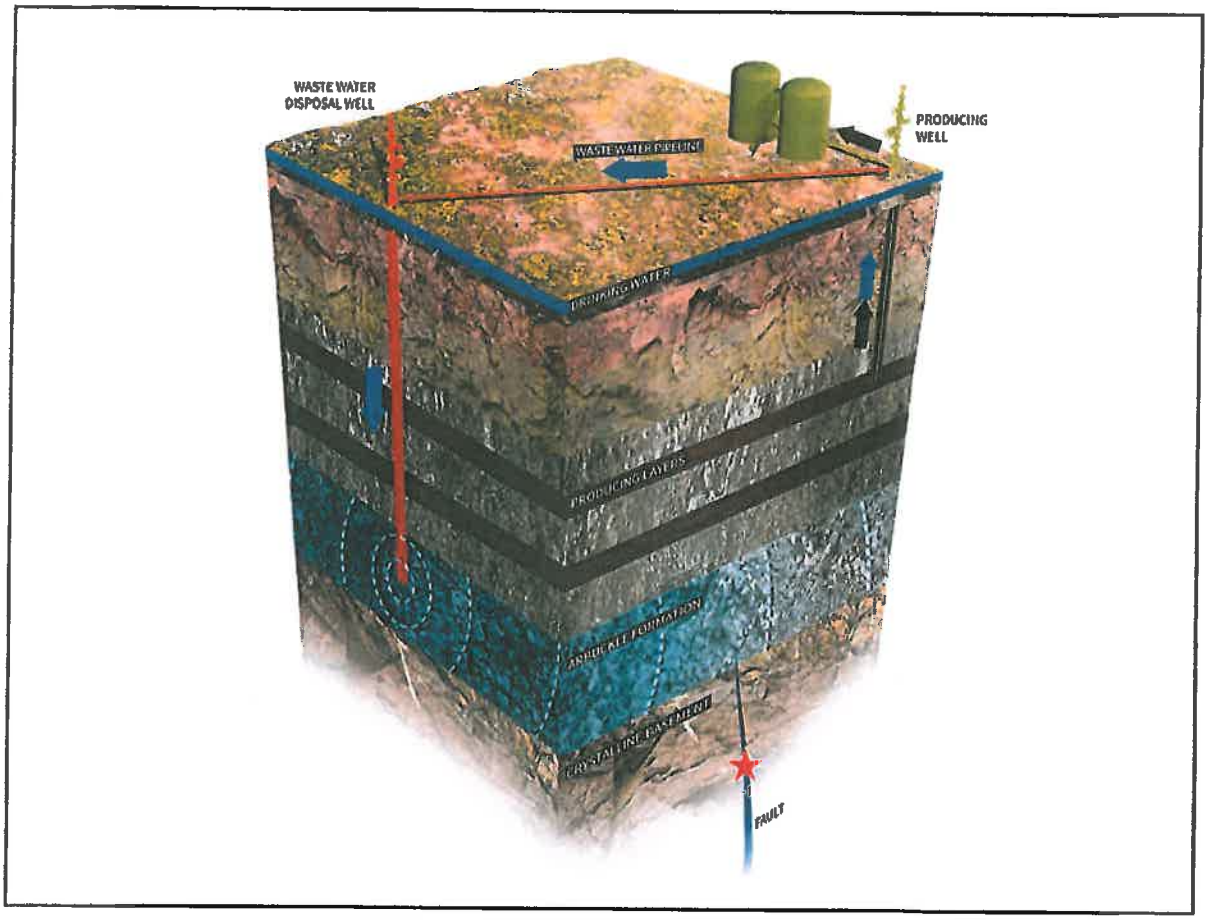

Figure 4: Mechanism of Induced and Triggered Seismicity[12]

40. Water from producing layers – for example from the Mississippi Lime or Woodford Shale – is brought to the surface along with oil. There are often ten barrels of water produced for every barrel of oil produced. The oil and water are separated, and then the water is reinjected. However, it is not put back into the same formation it was produced from; reinjection into the formation from which the water came is more difficult and expensive. To save money, Defendants usually dispose of in the Arbuckle Formation, which is the layer just above the

[12] Illustration from "Oklahoma Earthquakes Linked to Oil and Gas Wastewater Disposal Well, Say Stanford Researchers," by Ker Than, June 18, 2015 with the actual image crediting Professor Mark Zoback and doctoral student Rall Walsh. Article available online at http://news.stanford.edu/news/2015/june/okla-quake-drilling-061815.html

"crystalline basement" layer.[13] The water injected by Defendants increases the water pressure in the Arbuckle formation, and the injected water migrates out in a circle from each injection well. As the water injected by Defendants migrates, it encounters pre-existing fault lines in the crystalline basement. The affected fault may be some distance from the injection point, so there may be an apparent delay between the time of peak injection, the location of the injection, and the location of the induced earthquake.

41. There has been a dramatic increase in the frequency and intensity of earthquakes in Oklahoma since Defendants started large-volume injection of wastewater into the Arbuckle formation, particularly during the last five years. According to OGS, nearly 600 earthquakes magnitude 3.0 or greater were experienced in Oklahoma during 2014; less than one per year occurred in prior to 2009. From 2009 to 2014, Oklahoma experienced more than a 100-fold increase in total earthquakes: from 50 earthquakes in 2009 to more than 5,000 in 2014. Even more earthquakes shook Oklahoma in 2015.

42. The scale to classify earthquakes is logarithmic, meaning that a magnitude 2 earthquake is 10 times more powerful than a magnitude 1, and a magnitude 3 earthquake is 100 times more powerful than a magnitude 1. A magnitude 6 earthquake is 100,000 times as powerful as a magnitude 1 earthquake. Thus, with each increase in magnitude of quakes, the resulting damage is, by definition, an order of magnitude greater.

[13] Basement rock is the thick foundation of ancient, and oldest metamorphic and igneous rock that forms the crust of continents, often in the form of granite. Basement rock is contrasted to overlying sedimentary rocks such as sandstone and limestone which are laid down on top of the basement rocks after the continent was formed. The sedimentary rocks deposited on top of the basement usually form a relatively thin veneer, but can be more than three miles thick. The basement rock of the crust can be 20–30 miles thick, or more. The basement rock can be located under layers of sedimentary rock, or be visible at the surface. Basement rock is visible at the bottom of the Grand Canyon, consisting of 1.7-2 billion year old granite (Zoroaster granite) and schist (Vishnu Schist). The Vishnu Schist is believed to be highly metamorphosed igneous rocks and shale, from basalt, mud and clay laid from volcanic eruptions, and the granite is the result of magma intrusions into the Vishnu schist. An extensive cross section of sedimentary rocks laid down on top of it through the ages is visible as well. The sedimentary layers are those from which oil is produced, and wastewater injection is occurring to the very lowest level – the Arbuckle – right above the crystalline basement.

43. Earthquakes of magnitude 6 to 7 cause widespread damage and considerable loss of life. The destructive capacity of earthquakes near this magnitude was felt in Pottawatomie County in 2011.

44. In the first week of November 2011 three earthquakes of 5.0 to 5.7 occurred in and around Prague, Oklahoma. Prague is within a handful of miles of Pottawatomie County, and its effects were felt at St. Gregory in Shawnee, which suffered damage to all four of the turrets of Benedictine Hall. See Figure 5, adjacent.[14]

Figure 5: Damage to St. Gregory's Benedictine Hall 2011

[14] Figure 5 was taken by Sue Ogrocki and appeared courtesy of the Associated Press along with "A Seasoned Combatant of Tornadoes Now Finds the Earth Is Moving, Too," Marc Lacey, *New York Times*, Nov. 7, 2011.

45. The 5.7 magnitude earthquake in Prague, Oklahoma, in November 2011 was the strongest ever recorded in Oklahoma.

46. In 2014, Oklahoma had more than twice as many earthquakes as California. Oklahoma became the most seismically active state in the continental United States. Fifteen earthquakes in 2014 measured more than 4.0 in magnitude and 585 measured more than a magnitude 3 or greater. This trend continued in 2015 and does not seem to be letting up. Figure 6, adjacent shows earthquakes magnitude 4.0 or greater in the continental United States in 2015.[15] There were 15 in California which is considered an seismic active state, but there were 30 in Oklahoma.

Figure 6: Magnitude 4.0+ Earthquakes in 2015

[15] Figure 6 was generated by a query of the database tool available on http://earthquake.usgs.gov/. at the following web site http://earthquake.usgs.gov/earthquakes/map/ by clicking on the gear icon at the upper right corner of the screen.

47. Another large swarm of earthquakes just happened on February 13, 2016 centered around Fairview and Waynoka, Oklahoma. The largest quake in this swarm has been characterized as a magnitude 5.1 quake. This quake was the third largest ever in the State of Oklahoma after the Prague earthquake discussed above, and a presumably-natually-occuring magnitude 5.5 earthquake near El Reno, Oklahoma in 1952. The large quake on February 13 was part of a swarm of at least 10 smaller quakes around the same time. This swarm was noted in an insurance industry publication, which likely foretells even higher insurance rates ahead for Oklahomans.[16]

48. Fluid injection from wastewater wells can induce earthquakes in at least four ways: (1) the injection of fluids raises pore-fluid pressure within a fault; (2) the injection of fluids fills and compresses fluids within pore spaces causing deformation (poroelastic effects); (3) the injection of fluid that is colder than the rock into which it is being injected causes thermoelastic deformation, and (4) the injected fluid adds mass to the injection formation. Observations and numerical modeling indicate that increased fluid pressure within faults most strongly influences whether an injection well will induce earthquakes.

49. Injected fluids do not need travel the entire distance from the injection well to a fault for the injection to affect the fault's behavior. Injection can affect a fault's behavior via the change in fluid pressure, which can be transmitted greater distances than fluids themselves. The increase in the fluid pressure that is initiated at the injection well is transmitted to the fault without necessarily traveling the full distance between the well and fault.

> The fact that increased pore pressure at depth resulting from fluid injection can trigger slip on preexisting, already-stressed faults is well documented and the

[16] "5.1 M Quake Among Latest Swarm of Temblors in Oklahoma," *Insurance Journal*, Ken Miller, February 16, 2016. Available online at http://www.insurancejournal.com/news/southcentral/2016/02/16/398727.htm

> mechanisms by which triggered fault slip occurs are generally well known. Simply put, increased fluid pressure acts to unclamp a fault....
>
> The rate of widely felt M≥4 earthquakes has gone from about one per decade before 2009 (going all the way back to 1882) to 24 in 2014 alone, roughly a 200-fold increase....[17]

50. Injection wells can be operated without dramatically increasing the rate of triggered and induced earthquakes: reinject into the producing formation. There is an area around Ardmore, Oklahoma where there has been a very large and long-term injection of wastewater that has not resulted in the huge swarms of earthquakes triggered in other places with smaller injection volumes.[18] However, the injection methods that would prevent huge swarms of earthquakes are typically more expensive, so they have not been preferred. When operators choose methods that appear superficially cheaper, i.e., deep well injection instead of reinjection into the producing formation, they should have to bear the actual costs associated with those nominally cheaper injection methods, to wit: payment of the resulting earthquake insurance premiums.

51. As fluid is injected into a formation, the fluid pressure within that formation rises. If this fluid pressure increase is transmitted to a fault, the increase in pore pressure counteracts the stresses holding the fault closed (the normal stress), resulting in a lower effective stress. With lower effective normal stress clamping a fault, the frictional resistance to slip is lower and the fault is more prone to slip.

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[17] "Oklahoma's Recent Earthquakes and Saltwater Disposal," Sci. Adv., F.Rall Walsh III and Mark D. Zoback, June 18, 2015 at p.1.

[18] *Id.* at p.4. Figure 4 of the referenced article shows injection rates for Ardmore, which have arranged steadily upward from more than 10 million barrels per month well before 2000 up to 40 million barrels per month in recent years, yet there have been relatively few earthquakes. The article explains the relative paucity of earthquakes around Ardmore thus: "Because nearly all of the injection is occurring into enhanced oil recovery wells (that is, the injection is back into shallower producing formations), one would not expect a pressure buildup that could affect critically stressed basement faults."

52. There is an established a causal link between the injection of production wastes into the ground through disposal wells and earthquakes in Oklahoma. According to the USGS, hydraulic fracturing, long-term wastewater injection, and enhanced oil recovery have all induced earthquakes in the United States and Canada in the past few years. Wastewater disposal is responsible for the vast majority of the increase, including the largest and most-damaging induced earthquakes.

53. The recent increase in injection-induced seismicity is caused by a corresponding increase in wastewater disposal in the central United States. The earthquake rate increase in Oklahoma, where the vast majority of the increase has occurred, corresponds in time to a doubling of the wastewater disposal rate in the state from 1999 to 2013. Focusing on the areas of increased seismicity within Oklahoma, injection increased by factors of 5-10. Other areas of increased rates of induced earthquakes also experienced sudden increases in wastewater disposal.

54. A March 2013 study investigated the earthquakes in and around Prague, Oklahoma in 2011 and found a correlation between injection wells and the earthquakes devastating the town in November of 2011.[19]

55. A wide range of authoritative sources have established beyond reasonable scientific doubt that injection of wastewater is the cause of the increased earthquake activity in Oklahoma: this fact is scientifically undisputed.[20] Even the OGS, in the face of relentless pressure from the oil and gas industry has conceded the point:

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[19] "Potentially Induced Earthquakes in Oklahoma, USA: Links Between Wastewater Injection and the 2011 M 5.7 Earthquake Sequence," *Geology*, K.M. Keranen, et al., Mar. 25, 2013.

[20] USGS-Oklahoma Geological Survey Joint Statement on Oklahoma Earthquakes, Oct. 22, 2013; updated May 2, 2014. "Sharp Increase in Central Oklahoma Seismicity since 2008 Induced by Massive Wastewater Injection" *Science*, Keranan, et al., July 3, 2014. "Oklahoma's Recent Earthquakes and Saltwater Disposal," Sci. Adv., F.Rall Walsh III and Mark D. Zoback, June 18, 2015.

> [W]e know that the recent rise in earthquakes cannot be entirely attributed to natural causes....[T]he majority of recent earthquakes in central and north-central Oklahoma are very likely triggered by the injection of produced water in disposal wells.[21]

56. Earthquakes as large as magnitude 7 or even higher may occur. As previously noted, the damage from a magnitude 7 earthquake could be devastating. Even well-built structures could collapse.

> "I do think there's a really strong chance that Oklahoma will receive some strong shaking," said Daniel McNamara, a research geophysicist at the National Earthquake Information Center in Colorado, who has followed the state's quakes. Referring to the shocks that occurred Wednesday night, he added, "I'm surprised it didn't rupture into a larger event."[22]

DEFENDANT'S IMPROPER CONDUCT

57. Defendants operate wastewater injection wells in Pottawatomie County into which they inject huge volumes of wastewater under high pressures. These injection wells have caused the earthquakes occurring in and around Pottawatomie County. The earthquakes caused by Defendants' injection activities have resulted in property damage in Pottawatomie County. See, for example, Figure 5 above showing damage Benedictine Hall at St. Gregory's.

58. Instead of addressing the harm they have caused or, at least having the good sense to keep their mouths closed, Defendants and the oil and gas industry more generally have engaged in a campaign of disinformation that would have made the tobacco companies proud.

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[21] Oklahoma Office of the Secretary of Energy and Environment on the "Earthquakes in Oklahoma" web site under the "What We Know" page. The web site was posted by the Oklahoma Sec. of Energy on or about April 21, 2015 as reported in "Oklahoma Recognizes Role of Drilling in Earthquakes," *New York Times*, Michael Wines, April 21, 2015.

[22] "Earthquakes in Oklahoma Raise Fears of a Big One," *New York Times*, Michael Wines, Jan. 7, 2016 (quoting Michael McNamara, research geophysicist with the USGS; his bio is available online at https://profile.usgs.gov/professional/mypage.php?rfs=y&name=mcnamara, but suffice it to say that his qualifications and publications give that statement great gravitas).

Defendant New Dominion's former CEO and one of its founders, David J. Chernicky,, summarized the Defendants' position thus:

> If humans can cause an earthquake, then they "can probably fart and shift the orbit of the planet, too." He adds: "Man does not cause tsunamis in Japan. Man did not cause the volcanic blast at Krakatoa. And man does not cause earthquakes."[23]

59. Harold Hamm tried to silence OGS scientist, Austin Holland. Hamm enlisted Boren, Holland's then boss, to invite Holland to sit down for coffee with the University President / former senator and the powerful billionaire to discuss Holland's findings. Holland told the truth about the connection between earthquakes and injection wells, and he was eventually forced out at OGS.

CLASS ALLEGATIONS

60. Plaintiffs incorporate by reference the paragraphs outside of this section.

Plaintiff Class

61. Plaintiffs bring this action, on behalf of themselves and all others similarly situated, as a class action pursuant to 12 O.S. § 2023.

62. The class that Plaintiffs seek to represent (the "Class") is defined as follows: "All persons having an insurable interest in real property in the Class Area from 2011 through the time the Class is certified, and thereafter while any injunctive relief granted remains in force." "Class Area" means Pottawatomie County and counties surrounding and touching it, to wit: Cleveland, Lincoln, McClain, Okfuskee, Oklahoma, Pontotoc, and Seminole.

63. Two subclasses are defined: first, an insured subclass comprising Class Members who paid earthquake insurance premiums on real property in the Class Area from 2011 through

[23] "Can This Oil Baron's Company Withstand Another Quake," *Bloomberg Businessweek*, Benjamin Elgin and Matthew Phillips, April 23, 2015

the time the Class is certified ("Insured Subclass"); and second, Class Members not included in the first subclass ("Uninsured Subclass").

64. The following are excluded from the Class: Defendants and their directors, officers, employees and agents, and the judicial officer presiding over this case and his/her immediate family members.

65. Plaintiffs reserve the right to amend the Class definition -- including addition, deletion or modification of subclasses -- if discovery and further investigation reveals that the Class should be expanded or otherwise modified.

66. This action is brought and properly may be maintained as a class action pursuant to 12 O.S. § 2023 and satisfies the requirements those provisions.

67. ***Numerosity***. Each of the eight counties included in the Class Area have thousands of individuals that are included in the class definition. Joinder of all members of the Class in a single action impracticable, and therefore, the resolution of their claims through the procedure of a class action will be to the benefit of the parties and the Court.

68. ***Commonality***. Plaintiffs' claims raise issues of fact or law which are common to the members of the putative Class. These common questions include, but are not limited to whether: (a) Defendants' injection operations caused earthquakes in the Class Area; (b) Defendants owed a duty to the Plaintiffs and the members of the putative Class and whether that duty was breached; (d) Defendants' conduct amounted to a nuisance; (e) Defendants' conduct is an ultra-hazardous activity; (f) Defendants' operations were negligently performed; (g) Defendants caused a trespass; and (h) Plaintiffs and the putative Class Members are entitled to injunctive relief regarding Defendants' operations.

69. ***Typicality***. Plaintiffs' claims are typical of the claims of the other members of the Class they seek to represent because Defendants' wastewater injection operations have caused earthquakes, pose a significant danger, and have caused damages to Plaintiffs and the putative Class Members in a similar manner.

70. ***Adequate Representation***. Plaintiffs are interested in the outcome of this litigation and understand the importance of adequately representing the Class. Plaintiffs will fairly and adequately protect the interests of the Class sought to be certified. Plaintiffs are adequate representatives of the Class because they have no interests which are adverse to the interests of the members of the Class.

71. Plaintiffs are committed to the vigorous prosecution of this action and, to that end, Plaintiffs have retained counsel who are competent and experienced in handling class-action and complex tort litigation and who are qualified to adequately represent the Class.

72. ***Predominance***. Plaintiffs have pled this action seeking injunctive relief, not damages, so predominance and superiority do not have to be established as this action is presently formulated. Nevertheless, questions of law or fact common to the members of the Class predominate over questions affecting only individual members. A class action is superior to other available methods for the fair and efficient adjudication of the controversy because, inter alia, the dominant questions relate to Defendants' wastewater injection operations and whether these activities pose a nuisance, are ultrahazardous activities, were negligently performed, or caused trespasses such that entry of injunctive relief, both retroactive and prospective, is proper. The focus of this action will be Defendants' joint and cumulative conduct of injecting wastewater so as to cause earthquakes making purchase of earthquake insurance necessary.

73. Absent class action relief, the putative Class Members would be forced to prosecute thousands of similar claims in different venues around the State of Oklahoma. Such an event would cause tremendous amounts of waste of judicial resources, but the prosecution of these claims as a class action will promote judicial economy.

74. Prosecution of separate actions by individual members of the Class would create a risk of: (a) inconsistent or varying adjudications with respect to individual members of the Class which would establish incompatible standards of conduct for the Defendants; and (b) adjudications with respect to individual members of the Class which would as a practical matter be dispositive of the interests of the other members not parties to the adjudications or substantially impair or impede their ability to protect their interests. The first risk is inherent in prosecution of a multiplicity of actions, different cases will provide varying results.

75. The second factor brings in concerns regarding the financial ability of Defendants to bear the liability associated with the earthquakes they have created. Certainly, if there is a large and devastating earthquake near any major population center, Defendants named herein, and even the entire defendant class would be unable to bear the hundreds of millions, or even billions of dollars in liability that could easily result. See Table 2, below. Therefore, prudent class members wisely are procuring earthquake policies for their real property. Defendants, even a class of all operators in the State of Oklahoma could not bear the $1.8 billion in insured losses caused by a 6.9M quake in Santa Cruz, California, not to mention the $24 billion in damage caused in Los Angeles by a magnitude 6.7. Prudent property owners cannot simply sit back and hope that Defendants have enough money to pay the damages that would result if the "big one" hits Oklahoma – they will not have enough money, even in good financial times, and these are not good financial times.

TABLE 2
INSURED LOSSES CAUSED BY URBAN EARTHQUAKES

DATE	LOCATION	MAGNITUDE	INSURED LOSSES (2014 dollars)[24]
October 17, 1989	Santa Cruz, CA	6.9	$1.8 billion
January 17, 1994	Los Angeles, CA	6.7	$24 billion
February 28, 2001	Olympia, WA	6.8	$400 million

76. Plaintiffs have pled this action seeking injunctive relief, not damages, so manageability does not have to be established as this action is presently formulated.

Defendant Class

77. Plaintiffs bring this action, on behalf of themselves and all others similarly situated, against a class of defendants similarly situated pursuant to 12 O.S. § 2023.

78. The class of defendants that Plaintiffs seek to include (the "Defendant Class") is defined as follows: "All persons operating an underground injection well in the Class Area from 2011 through the time the Class is certified, and thereafter while any injunctive relief granted remains in force."

79. Plaintiffs reserve the right to amend the Class definition -- including addition, deletion or modification of subclasses -- if discovery and further investigation reveals that the Class should be expanded or otherwise modified.

80. This action is brought and properly may be maintained as a class action against defendants pursuant to 12 O.S. § 2023 and satisfies the requirements those provisions.

81. ***Numerosity***. In Pottawatomie County alone, nearly 100 companies have operated at least one injection well from 2012 to 2014. Additional numbers of operators have wells in the

[24] Insured losses in 2014 dollars are taken from "Earthquakes: Risk and Insurance Issues," *Insurance Information Institute,* September 2015. Available online at http://www.iii.org/issue-update/earthquakes-risk-and-insurance-issues

other seven counties included in the Class Area. Naming hundreds of defendants in a single action is impractical.

82. ***Commonality***. Plaintiffs' claims raise issues of fact or law which are common to the members of the putative Defendant Class. These common questions include, but are not limited to whether: (a) Defendants' injection operations caused earthquakes in the Class Area; (b) Defendants owed a duty to the Plaintiffs and the members of the putative Class and whether that duty was breached; (d) Defendants' conduct amounted to a nuisance; (e) Defendants' conduct is an ultra-hazardous activity; (f) Defendants' operations were negligently performed; (g) Defendants caused a trespass; and (h) Plaintiffs and the putative Class Members are entitled to injunctive relief regarding Defendants' operations.

83. ***Typicality***. Plaintiffs' claims against the named defendants are typical of the claims of the other members of the Defendant Class they seek to pursue because Defendants' wastewater injection operations have caused earthquakes, pose a significant danger, and have caused injuries to Plaintiffs and the putative Class Members in a similar manner. Named defendants are typical of the operators of injection wells, and their defenses are typical of the class Plaintiffs seek to certify.

84. ***Adequate Representation***. The named Defendants are interested in the outcome of this litigation and understand the importance of adequately representing their own interests and thus those of the defendant class. Defendants will fairly and adequately protect the interests of the Defendant Class sought to be certified. Defendants are the largest injectors in Pottawatomie County and some of the largest in the state, but the named Defendants also include smaller "mom and pop" type injection well operators, so the interests of both small and large members of the defendant class are adequately represented. Named defendants are adequate

representatives of the Class because they have no interests which are adverse to the interests of the members of the Class.

85. There is every reason to believe that the named Defendants will be committed to the vigorous prosecution of this action and, to that end, will retain counsel who are competent and experienced in handling class-action and complex tort litigation and who are qualified to adequately represent the Defendant Class.

86. ***Predominance***. Plaintiffs have pled this action seeking injunctive relief, not damages, so predominance and superiority do not have to be established as this action is presently formulated. Nevertheless, questions of law or fact common to the members of the Defendant Class predominate over questions affecting only individual members. A class action is superior to other available methods for the fair and efficient adjudication of the controversy because, inter alia, the dominant questions relate to Defendants' wastewater injection operations and whether these activities pose a nuisance, are ultrahazardous activities, were negligently performed, or caused trespasses such that entry of injunctive relief, both retroactive and prospective, is proper. The focus of this action will be Defendants' joint and cumulative conduct of injecting wastewater so as to cause earthquakes making purchase of earthquake insurance necessary.

87. Absent certification of a Defendant Class, the putative Class Members could be forced to name hundreds of injection well operators to secure complete relief. Such an event would cause tremendous amounts of waste of judicial resources, but the prosecution of these claims as a class action will promote judicial economy.

88. Prosecution of separate actions against individual members of the Defendant Class would create a risk of: (a) inconsistent or varying adjudications with respect to individual

members of the Defendant Class which would establish incompatible standards of conduct for the Defendants; and (b) adjudications with respect to individual members of the Defendant Class which would as a practical matter be dispositive of the interests of the other members not parties to the adjudications or substantially impair or impede their ability to protect their interests.

89. Plaintiffs have pled this action seeking injunctive relief, not damages, so manageability does not have to be established as this action is presently formulated. Plaintiffs are not aware of any difficulty which will be encountered in the management of this litigation which should preclude its maintenance as a class action.

CAUSES OF ACTION

90. Plaintiffs incorporate by reference the paragraphs outside of this section.

Count I - Private Nuisance

91. Defendants' conduct constitutes a private nuisance.

92. Plaintiffs and the putative Class have property rights and are privileged regarding the use and enjoyment of their homes, businesses, and land. Defendants' actions and operations, as described above, have unlawfully and unreasonably interfered with those rights and privileges.

Count II - Ultrahazardous Activities

93. Defendants' actions described above constitute ultra-hazardous activities that involve a high degree of risk of serious harm to a person or the chattels of others, the risk cannot be eliminated by exercising the utmost care, and is not a matter of common usage.

94. As a direct and proximate result of Defendants' ultra-hazardous activities, Plaintiffs and the putative Class have sustained injuries that are the direct and proximate result of

Defendants' ultra-hazardous or abnormally dangerous activities, to which Defendants are strictly liable.

Count III - Negligence

95. Defendants owed a duty to Plaintiffs and the putative Class to use ordinary care not to operate or maintain their injection wells in such a way to cause or contribute to seismic activity.

96. Defendants, experienced in these operations, knew or should have known of the connection between injection wells and seismic activity, and acted in disregard of these facts.

97. Defendants breached their duty to Plaintiffs and the putative Class to use ordinary care and not to operate or maintain their injection wells in such a way to cause or contribute to seismic activity.

98. As a direct and proximate result of these acts, omissions and fault of the Defendants, the Plaintiffs and the Class have suffered injuries reasonably foreseeable to the Defendants.

Count IV - Trespass

99. Plaintiffs and the members of the putative Class are and have been lawfully entitled to possession of their property.

100. Defendants, without the permission or consent of Plaintiffs and any putative Class Members and without legal right, intentionally engaged in activities that resulted in concussions or vibrations entering Plaintiffs' and Class Members' property. Such unauthorized invasion of Plaintiffs' and the Class Members' property interests constitutes a trespass.

101. Because of Defendants' trespass, Plaintiffs and the putative Class have suffered injuries.

WHEREFORE, Plaintiffs and the Class pray that this Court award injunctive relief against Defendants and in favor of Plaintiffs and the Class, awarding Plaintiffs and the Class the following relief:

a. Certification of the Plaintiff Class and Defendant Class as requested in this Petition;

b. Appointment as Class Counsel the counsel for Plaintiffs named below;

c. Appointment of Defendant Class counsel;

d. Entry of a temporary injunction directing Defendant Class to reimburse Class Members for earthquake insurance premiums as they are incurred;

e. Entry of permanent injunction -

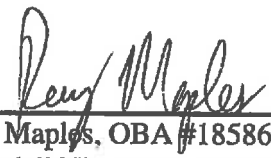
1. Directing Defendant Class to reimburse Plaintiff Class for earthquake insurance premiums incurred during the Class Period,

2. Directing Defendant Class to reimburse Class Members for earthquake insurance premiums as they are incurred until such time as Defendant Class shows the Court by satisfactory evidence that their activities no longer present a reasonable risk of creating earthquakes or as otherwise directed by the Court;

f. Award of attorney fees, costs, expenses, including pre-judgment and post-judgment interest; and

g. Grant of all other relief to which Plaintiffs and the Class are entitled or which the Court deems just.

Respectfully submitted,



Ray Maples, OBA #18586
Glendell Nix, OBA #13747
Maples, Nix & Diesselhorst, PLLC
15401 North May Avenue
Edmond, Oklahoma 73013
Telephone: (405) 478-3737
Facsimile: (405) 513-5005
Email: ray@mndlawfirm.com
glendell@mndlawfirm.com

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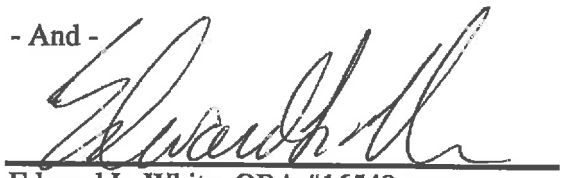

Edward L. White, OBA #16549
Kerry D. Green, OBA #31998
Edward L. White, P.C.
829 East 33rd Street
Edmond, Oklahoma 73013
Telephone: (405) 810-8188
Facsimile: (405) 608-0971
Email: ed@edwhitelaw.com
kerry@edwhitelaw.com

ATTORNEYS FOR PLAINTIFFS

ATTORNEY LIEN CLAIMED
JURY TRIAL DEMANDED