

Before the State Corporation Commission of the State of Kansas:

In the Matter of the Application of Orca

Docket No: 19-CONS-3266-CUIC

Operating Company, LLC to Authorize

Conservation Division

Injection of Saltwater into the Arbuckle

License Number: 5135

Formation at the Shoffner SWD #12-1,
located in Section 12, Township 25 South,
Range 9 West, Reno County, Kansas.

Protestor Pre-Filed Direct Testimony

This is the testimony of Adam and Jessica Pickett, 22617 W Irish Creek Rd, Arlington, Kansas 67514 as it relates to Orca Operating Company LLC, 427 S Boston, STE 400, Tulsa, OK, 74103, license number 34358 proposed Injection disposal well. The well is known as Shoffner SWD, Well #12-1 and is located in Reno County, SE corner of Sec 12, Twp 25, R 9 (12-25-9), 775 feet from the South line of the section and 380 feet from the East line of the section.

We own the 80 acres south of the proposed well site known as the North 80 on the North east section of 13-25-9. On this property we have our home (22617 W Irish Creek Rd, Arlington KS, 67514), a pond for livestock, a waterway, residential water wells and two old oil wells. All of this is within a half mile or less of the proposed drilling site. We feel that there is the possibility of loss, both environmentally and monetarily on our part with the approval of said well by the KCC.

I, Adam Pickett, have been in the hazardous materials emergency response, handling and mitigation field since 1998. I started out as a Hazardous Materials Handling Officer in the military. I completed the Department of Defense Hazardous Materials / Hazardous Waste Handling and Spill Response Course, Department of Defense Hazard Communications Course, Hazardous Material Handling Course and was IFSAC certified Hazardous Materials Operations Level responder.

After my military service, I worked for KBR (Kellogg, Brown and Root) while it was still a subsidiary of Halliburton. This was during the LOGCAP (U.S. Army's Logistics Civil Augmentation Program) years. My main job was fire protection for overseas U.S. interests, but my secondary job was assisting with hazardous materials in the form of handling and storage of waste, MSDS, and spill response and mitigation.

Presently, I hold the rank of Captain on a large, paid fire department. I serve as a back-up member to the department's Hazardous Materials Response team. As a Lieutenant, prior to my promotion to Captain, I was a member of the team. This team is also the South-Central Kansas Regional

Response Team under the Kansas State Fire Marshal's Office and the Department of Homeland Security. I hold a certification as an IFSAC Hazardous Material's Technician, have assisted with instructing Hazmat Technician Classes per NFPA 472 and I am certified to do maintenance on several of our monitoring equipment.

Basic Hazardous materials response teaches responders to stay up hill, up wind, and up stream, never be in the path of a product if at all possible and time, distance and shielding are more than just the steps to protect yourself from radioactivity but can be used for any response. The location of our property is downhill, downstream and can be down wind of the proposed well sight. The well sight is within 100 feet of a stream that leads onto our property. This short *distance* leaves crews a very short *time* to notice and mitigate any problems. The limited vegetation provides very little natural *shielding* for the stream.

The U.S. Government Accountability Office (GAO) stated in their study of Shale Oil and Gas Development GAO-12-732 that,

"(The)unintentional emissions of pollutants from faulty equipment or impoundments— temporary storage areas. Similarly, several studies and publications GAO reviewed indicate that shale oil and gas development poses risks to water quality from contamination of surface water and groundwater as a result of erosion from ground disturbances, spills and releases of chemicals and other fluids, or underground migration of gases and chemicals. For example, tanks storing toxic chemicals or hoses and pipes used to convey wastes to the tanks could leak, or impoundments containing wastes could overflow as a result of extensive rainfall. According to the New York Department of Environmental Conservation's 2011 Supplemental Generic Environmental Impact Statement, spilled, leaked, or released chemicals or wastes could flow to a surface water body or infiltrate the ground, reaching and contaminating subsurface soils and aquifers."

"Shale oil and gas development poses a risk to water quality from spills or releases of toxic chemicals and waste that can occur as a result of tank ruptures, blowouts, equipment or impoundment failures, overfills, vandalism, accidents (including vehicle collisions), ground fires, or operational errors. For example, tanks storing toxic chemicals or hoses and pipes used to convey wastes to the tanks could leak, or impoundments containing wastes could overflow as a result of extensive rainfall. According to New York Department of Environmental Conservation's 2011 Supplemental Generic Environmental Impact Statement, spilled, leaked, or released chemicals or wastes could flow to a surface water body or infiltrate the ground, reaching and contaminating subsurface soils and aquifers. In August 2003, we reported that damage from oil and gas related spills on National Wildlife Refuges varied widely in severity, ranging from infrequent small spills with no known effect on wildlife to large spills causing wildlife death and long-term water and soil contamination.⁵³

Drill cuttings, if improperly managed, also pose a risk to water quality. Drill cuttings brought to the surface during oil and gas development may contain naturally occurring radioactive materials (NORM),⁵⁴ along with other decay elements (radium-226 and radium-228), according to an industry report presented at the Society of Petroleum Engineers Annual Technical Conference and Exhibition.⁵⁵

53GAO, *National Wildlife Refuges: Opportunities to Improve the Management and Oversight of Oil and Gas Activities on Federal Lands*, According to the report, drill cuttings are stored and transported through steel pipes and tanks—which the radiation cannot penetrate. However, improper transport and handling of drill cuttings could result in water contamination. For example, NORM concentrations can build up in pipes and tanks, if not properly disposed, and the general public or water could come into contact with them, according to an EPA fact sheet.⁵⁶

The chemical additives in fracturing fluid, if not properly handled, also poses a risk to water quality if they come into contact with surface water or groundwater. Some additives used in fracturing fluid are known to be toxic, but data are limited for other additives. For example, according to reports we reviewed, operators may include diesel fuel—a refinery product that consists of several components, possibly including some toxic impurities such as benzene and other aromatics—as a solvent and dispersant in fracturing fluid. While some additives are known to be toxic, less is known about potential adverse effects on human health in the event that a drinking water aquifer was contaminated as a result of a spill or release of fracturing fluid, according to the 2011 New York Department of Environmental Conservation’s Supplemental Generic Environmental Impact Statement. This is largely because the overall risk of human health effects occurring from hydraulic fracturing fluid would depend on whether human exposure occurs, the specific chemical additives being used, and site-specific information about exposure pathways and environmental contaminant levels.

The produced water and fracturing fluids returned during the flowback process contain a wide range of contaminants and pose a risk to water quality, if not properly managed.⁵⁷ Most of the contaminants occur naturally, but some are added through the process of drilling and hydraulic fracturing. In January 2012, we reported that the range of contaminants found in produced water can include, but not limited to

- salts, which include chlorides, bromides, and sulfides of calcium, magnesium, and sodium;
- metals, which include barium, manganese, iron, and strontium, among others;
- oil, grease, and dissolved organics, which include benzene and toluene, among others;
- NORM; and
- production chemicals, which may include friction reducers to help with water flow, biocides to prevent growth of microorganisms, and additives to prevent corrosion, among others.

At high levels, exposure to some of the contaminants in produced water could adversely affect human health and the environment. For example, in January 2012, we reported that, according to EPA, a potential human health risk from exposure to high levels of barium is increased blood pressure.⁵⁹ From an environmental standpoint, research indicates that elevated levels of salts can inhibit crop growth by hindering a plant’s ability to absorb water from the soil. Additionally, exposure to elevated levels of metals and production chemicals, such as biocides, can contribute to increased mortality among livestock and wildlife.

Operators must transport or store produced water prior to disposal. According to a 2012 University of Texas report, produced water temporarily stored in tanks (see fig. 12) or impoundments prior to treatment or disposal may be a source of leaks or spills, if not properly managed. The risk of a leak or spill is particularly a concern for surface impoundments as improper liners can tear, and impoundments can overflow. From an environmental standpoint, research indicates that elevated levels of salts can inhibit crop growth by hindering a plant's ability to absorb water from the soil. Additionally, exposure to elevated levels of metals and production chemicals, such as biocides, can contribute to increased mortality among livestock and wildlife. 60 59 For example, according to state regulators in North Dakota, in 2010 and 2011, impoundments overflowed during the spring melt season because operators did not move fluids from the impoundments—which were to be used for temporary storage – to a proper disposal site before spring thaw.”

As the study shows, this is something most people do not want to be downstream from. This GAO report also talks about erosion and the effects it can have. The GAO found that;

“Oil and gas development, whether conventional or shale oil and gas, can contribute to erosion, which could carry sediments and pollutants into surface waters. Shale oil and gas development require operators to undertake a number of earth-disturbing activities, such as clearing, grading, and excavating land to create a pad to support the drilling equipment. If necessary, operators may also construct access roads to transport equipment and other materials to the site. As we reported in February 2005, as with other construction activities, if sufficient erosion controls to contain or divert sediment away from surface water are not established then surfaces are exposed to precipitation and runoff could carry sediment and other harmful pollutants into nearby rivers, lakes, and streams.62 For example, in 2012, the Pennsylvania Department of Environmental Protection concluded that an operator in the Marcellus Shale did not provide sufficient erosion controls when heavy rainfall in the area caused significant erosion and contamination of a nearby stream from large amounts of sediment.63 As we reported in February 2005, sediment clouds water, decreases photosynthetic activity, and destroys organisms and their habitat.”

With the location of this site, these are all very real risks. The high-water table and amount of flooding that comes from this ground and flows to ours is concerning. The GAO report talks about not having sufficient erosion controls. **Attachment 1, Road Flooding**, shows how high and how much water runs over Irish Creek Road heading south and onto our property. This picture was taken 10/9/2018. These types of flooding events happen at least once a year. Flooding also happened in October 2017. According to Reno County and the Kansas Department of Agriculture the proposed location for both the oil well and the injection well are already in a flood plain. **Attachment 10, Well Location**, red dot is approximate location of the well.

The location a pit along with the well site will cause any runoff from rain and snow, along with any spills, to drain south. The runoff would flow into a stream that feeds our pond. This pond is used for livestock and the water from it continues downstream supplying water for others' livestock and eventually making its way to Cheney reservoir that provides drinking water to the city of Wichita.

This site also located in a swamp with a very high-water table and springs. Most years it would be difficult to walk across, let alone operate equipment. Per the Application for Surface Pit, it is marked that the pit location is in a Sensitive Ground Water Area. As area residents, who are very familiar with the land, we would agree that this site allows easy access for contaminants to enter both surface water and into the water table. Any spills on the surface may quickly enter the water table and or spread to the stream. The elevation of the site in comparison with the standing water is apparent in [Attachment 2, Site elevation](#). Time, distance, shielding for the ground water have all been compromised with the location of this site.

Another concern with runoff at this location is in the event of a catastrophic failure. Within the last year there have been two oil tank battery fires, with one being at a “modern” site. Both were within 15 miles of Orca’s proposed site. The “modern” site was two and a half miles to the west. [Attachment 3, Tank Explosion](#), (5-2-2018) shows how the containment barrier was insufficient and that the tanks and products did not stay within the barrier. [Attachment 4, Tank Fire](#), shows crews trying to extinguish a tank fire on 4-21-2018. Firefighting activities nearly overflowed the containment barriers while waiting on resources from the oil company that operated this battery. If either one of these incidents had happened at the proposed Orca site, the runoff would have migrated into the ground water and / or the stream and on to our property.

Our property currently has two old oil wells, [Attachment 5, Hayes Well](#) and [Attachment 6, Brooks Johnson Well](#). Both wells have been plugged according to records from the KGS and the KCC. The Brooks Johnson Well did not go deep enough to enter the Arbuckle. However, The Hayes well did. We have concerns that the products being injected into the Orca well be returning to the surface via the Hayes well. This well was plugged in 1964, per records. The quality of work at that time most likely would be sub-par by today’s standards. The KCC started the Abandoned Oil and Gas Well / Site Remediation Fund in 1996 to, per the KCC’s web site, “address the problem of abandoned oil and gas wells and remediation sites related to oil and gas exploration and production activities.” This was 32 years after the Hayes well was plugged that problems were being found and addressed. What guarantees are there that this well was properly plugged and / or those plugs are still sufficient 55 years later?

Having contaminants enter the ground water is a problem we’ve dealt with before. In 2001 I lived at 23811 W Irish Creek Rd. This house was owned by Edwin and Theda Shultz at the time. That domestic well water was contaminated by brine from old wells. That contamination spread to two center pivot irrigation systems to the north of this address also. We do not want to go down that same road with the Hayes well and the proposed Orca injection well. The old timers in the area talk about how oil companies would shove an old hedge post down a well until it stopped then through in some concrete and call it good because nobody really checked.

There are many studies that say injection of wastewater can induce earthquakes that go back to the 1960s. The volume and rate of the injected wastewater can cause it to find pathways to faults, or back up our old wells. Per earthquake.usgs.gov web site states, “Wells not requiring surface pressure to inject wastewater can still induce earthquakes. Wells where you can pour fluid down the well without

added pressure at the wellhead still increase the fluid pressure within the formation and thus can induce earthquakes.” Or pushing waste back up our old wells.

Oklahoma has reduced some disposal rates from 17,000 barrels a day to 5,000. The KCC has also considered making targeted limitations on injection rates. The trend is cutting back on rates. We would like to see the same done on the Orca well in order to remove some of the risk of both earthquakes and our old wells becoming a pathway for waste. The KCC has already cut rates in portions of Harper and Sumner counties and with these cuts the seismic activities have trended down.

In closing our testimony, we would like to see several issues addressed. Ideally, we would like to not be down range of such a hazard. We would like to see the KCC and Orca relocate the location of this site. Moving the site to the north a quarter mile would alleviate nearly some of these concerns. This would move the proposed well away from our old wells. The new sight would be out of a swamp, reducing runoff into a stream. The ground north of the current location lays flatter and has more vegetation to control runoff from the drill site. This would appear to move the site away from any sensitive ground water areas. Less than a ¼ mile north, appears to us, to be a better drilling site. We believe that financial cost to the driller along with risk to the environment when compared to the current proposed location would be greatly reduced.

Other issues we would like to see addressed are runoff and absorption control from the well sight of both spills and natural precipitation. Monitoring of both our pond water and domestic well water by a third party with the cost being covered by Orca for as long as there is a drill site at this location. A site-specific emergency response plan for not only when the well is completed but also during construction along with an environmental impact plan annually. Limit the injection rate of the well.

Finally, we have already had issues with Orca’s contractors (Attachment 7, Pickup) turning around on our crops, Attachment 8, Crop Damage. Along with the noise pollution of bulldozers and semi-trucks using their Jake Brakes all day long and damaging Sterling road. Attachment 9, Road Damage.

With all the issues that have been shown with injection wells from numerous studies by the Federal Government, academia and others, along with our personal experience with the oil industry, we are asking that this well site, at its current location not be approved by the KCC. This is not something we want to deal with for years to come.

Adam and Jessica Pickett

Attachment 1, Road Flooding



Attachment 2, Site elevation



Attachment 3, Tank Explosion



Attachment 4, Tank Fire



Attachment 5, Hayes Well

KGS

**Oil and Gas
Well
Database**

Specific Well--15-155-01016

Oil & Gas

All Well Data

| | |
|---|---|
| API: 15-155-01016 KID: 1002939429 Lease: HAYES Well: 1 Original operator: HENDRICK T K Current operator: unavailable Field: Unknown Location: T25S R9W, Sec. 13 NW NE 4620 North, 1980 West, from SE corner Longitude: -98.258584 Latitude: 37.8811549 Lat-long calculated from footages County: Reno | Permit Date: Sep-25-1964 Spud Date: Completion Date: Oct-14-1964 Plugging Date: Oct-15-1964 Well Type: D&A Status: Plugged and Abandoned Total Depth: 4321 Elevation: 1659 KB Producing Formation: IP Oil (bbl): IP Water (bbl): IP GAS (MCF): KCC Docket No.: |
| View well on interactive map | |

ACO-1 and Driller's Logs

Documents from the KCC

- [Intent To Drill Well](#) (received by KGS Sep 25, 1964)
- [Intent To Drill Well](#) (received by KGS Sep 25, 1964)
- [KCC Agents Plugging Report](#) (received by KGS Oct 15, 1964)
- [Operator's Plugging Report](#) (received by KGS Oct 15, 1964)
- [Plugging Application](#) (received by KGS Oct 15, 1964)
- [Verbal Plugging Permit](#) (received by KGS Oct 15, 1964)

For information on software to view and use

the files we distribute on our web pages,
please view our [File Format Tools](#) page.

Wireline Log Header Data

| | |
|---|---|
| Logger: Schlumberger Tool: Dual Induction Laterolog Operator on log HENDRICK T K Top: 220; Bottom: 4318 Log Date: Oct-14-1964 BHT: 108F Gamma Ray: Y Spontaneous Potential: Y Holdings at: Lawrence | <ul style="list-style-type: none">• Download Black and White Scan (Zip size: 664 k) |
| For information on software to view and use the files we distribute on our web pages, please view our File Format Tools page. | |

Cuttings Data

Box Number: 66135
Starting Depth: 1950
Ending Depth: 3950

Box Number: 66134
Starting Depth: 2210
Ending Depth: 10950

Box Number: 66136
Starting Depth: 3950
Ending Depth: 4321

Tops Data

| Formation (source name) | Top | Base | Source | Updated |
|--------------------------------------|------|------|--------|-------------|
| Topeka Limestone Formation (TPKA) | 2784 | | | Apr-15-1999 |
| Lansing Group | 3324 | | | Apr-15-1999 |

| | | | | |
|--------------------------------------|------|--|--|-------------|
| (LANSING) | | | | |
| Mississippian System (MISS SYS) | 3843 | | | Apr-15-1999 |
| Viola Limestone Formation (VIOLA) | 4150 | | | Apr-15-1999 |
| Simpson Group (SIMPSON) | 4214 | | | Apr-15-1999 |
| Arbuckle Group (ARBK) | 4292 | | | Apr-15-1999 |

Information from Outside Sources

Please note: The link below takes you away from the web site of the Kansas Geological Survey to the website of the Kansas Geological Society, a library in Wichita. The Survey can not help with information presented by the Walters Digital Library.

[From Kansas Geological Society's Walters Digital Library](#)

[Kansas Geological Survey](#), Oil and Gas Well Database

Comments to webadmin@kgs.ku.edu

URL=<http://www.kgs.ku.edu/Magellan/Qualified/index.html>

Well Display Program Updated Jan. 2008. Data added continuously.

Attachment 6, Brooks Johnson Well

Specific Well--15-155-
21247

All Well Data

Oil & Gas

| | |
|--|---|
| API: 15-155-21247 KID: 1006117975 Lease: Brooks-Johnson Well: 1-13 Original operator: Griggs Oil, Inc. Current operator: Corsair Energy, LC Field: Langdon East Location: T25S R9W, Sec. 13 W2 NW NE 660 South, 2310 West, from NE corner Longitude: -98.2597291 Latitude: 37.8811568 Lat-long calculated from footages County: Reno | Permit Date: Mar-17-1993 Spud Date: Mar-17-1993 Completion Date: Apr-30-1993 Plugging Date: Jan-19-1995 Well Type: OIL-P&A Status: Plugged and Abandoned Total Depth: 4000 Elevation: 1661 KB Producing Formation: IP Oil (bbl): IP Water (bbl): IP GAS (MCF): KDOR code for Oil: 132170 KDOR code for Gas: 218813 KCC Docket No.: |
| View well on interactive map | |

ACO-1 and Driller's Logs

PDF files from the KGS

- [DST Report](#)

Documents from the KCC

- [Intent To Drill Well](#) (received by KGS Mar 17, 1993)
- [Intent To Drill Well](#) (received by KGS Mar 17, 1993)
- [Well Completion Report](#) (received by KGS Apr 30, 1993)
- [KCC Technician's Plugging Report](#) (received by KGS Jan 19, 1995)

- [Operator's Plugging Report](#) (received by KGS Jan 19, 1995)
- [Plugging Application](#) (received by KGS Jan 19, 1995)

For information on software to view and use the files we distribute on our web pages, please view our [File Format Tools](#) page.

Wireline Log Header Data

| | |
|---|--|
| Logger: Halliburton Tool: Dual Induction Laterolog Operator on log GRIGGS OIL INC. Top: 186; Bottom: 3997 Log Date: Mar-27-1993 BHT: 118F Gamma Ray: Y Spontaneous Potential: Y Holdings at: Lawrence | <ul style="list-style-type: none"> • Download Black and White Scan (Zip size: 1.4 megs) |
| Logger: Halliburton Tool: Spectral Density Dual Spaced Neutron II Operator on log GRIGGS OIL INC. Top: 2250; Bottom: 3964 Log Date: Mar-27-1993 BHT: 118F Gamma Ray: Y Spontaneous Potential: Holdings at: Lawrence | <ul style="list-style-type: none"> • Download Black and White Scan (Zip size: 1.2 megs) |
| Logger: Geologist's Report Tool: Drilling Time and Sample Log Operator on log GRIGGS OIL INC. Top: 0; Bottom: 4000 Log Date: Mar-27-1993 BHT: Gamma Ray: Spontaneous Potential: Holdings at: | |

| | |
|---|--|
| Logger: Halliburton Tool: Microlog Operator on log GRIGGS OIL INC. Top: 3800; Bottom: 3981 Log Date: Mar-27-1993 BHT: 118F Gamma Ray: Y Spontaneous Potential: Holdings at: | |
| Logger: Trilobite Testing Company Tool: Drill Stem Test Operator on log Griggs Oil, Inc. Top: 3788; Bottom: 3894 Log Date: Mar-26-1993 BHT: F Gamma Ray: Spontaneous Potential: Holdings at: Lawrence | |
| For information on software to view and use the files we distribute on our web pages, please view our File Format Tools page. | |

Cuttings Data

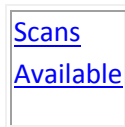
Box Number: D0958
Starting Depth: 2200
Ending Depth: 4000

Tops Data

| Formation (source name) | Top | Base | Source | Updated |
|-----------------------------------|------|------|--------|-------------|
| Heebner Shale Member (HEEBNER) | 3121 | | | Apr-15-1999 |
| Lansing Group (LANSING) | 3324 | | | Apr-15-1999 |
| Kansas City Group | 3691 | | | Apr-15-1999 |

| | | | | |
|------------------------------------|------|--|--|-------------|
| (KANSAS CITY) | | | | |
| Cherokee Group (CHEROKEE) | 3794 | | | Apr-15-1999 |
| Mississippian System (MISS SYS) | 3842 | | | Apr-15-1999 |
| Kinderhookian Stage (KDHK GRP) | 3915 | | | Apr-15-1999 |

DST Data



Oil Production Data

[This well has been linked to an oil lease.](#)

Gas Production Data

[This well has been linked to a gas lease.](#)

Information from Outside Sources

Please note: The link below takes you away from the web site of the Kansas Geological Survey to the website of the Kansas Geological Society, a library in Wichita. The Survey can not help with information presented by the Walters Digital Library.

[From Kansas Geological Society's Walters Digital Library](#)

[Kansas Geological Survey](#), Oil and Gas Well Database

Comments to webadmin@kgs.ku.edu

URL=<http://www.kgs.ku.edu/Magellan/Qualified/index.html>

Well Display Program Updated Jan. 2008. Data added continuously.

Attachment 7, Pickup



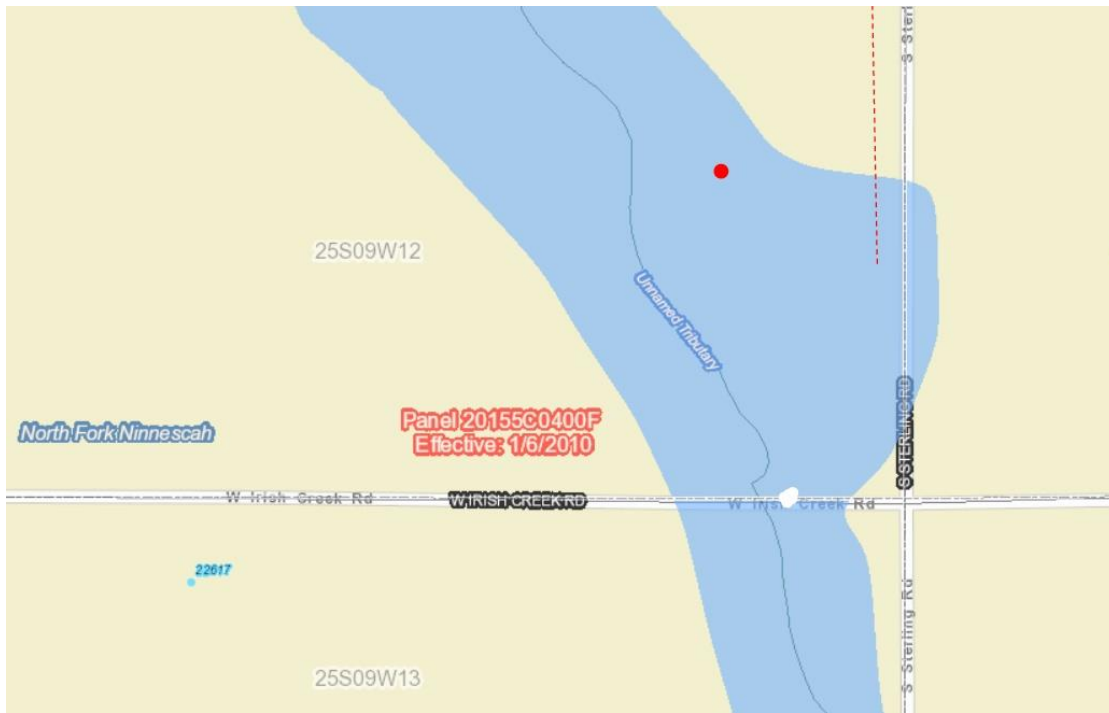
Attachment 8, Crop Damage



Attachment 9, Road Damage



Attachment 10, Well Location



CERTIFICATE OF SERVICE

I, the undersigned, certify that the true copy of the attached Order has been served to the following parties by means of electronic service on the 28th of March, 2019 and was filed on e-file Express on the 1st of April, 2019.

ADAM & JESSICA PICKETT
22617 W. IRISH CREEK RD
ARLINGTON, KS 67514
pickettfamilyfarming@gmail.com

JONATHAN R. MYERS, ASSISTANT GENERAL
COUNSEL

KANSAS CORPORATION COMMISSION

266 N. Main St., Ste. 220

WICHITA, KS 67202-1513

Fax: 316-337-6211

j.myers@kcc.ks.gov

LAUREN WRIGHT, LITIGATION COUNSEL

KANSAS CORPORATION COMMISSION

266 N. Main St. , Ste. 220

WICHITA, KS 67202-1513

Fax: 316-337-6211

l.wright@kcc.ks.gov

DAVID E. BENGTSON, ATTORNEY

STINSON LEONARD STREET LLP

1625 N WATERFRONT PKWY STE 300

WICHITA, KS 67206

Fax: 316-265-1349

david.bengtson@stinson.com

Signed: Adam Pickett
4/1/19 Adam Pickett