Osage Land & Cattle Co.
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September 1, 2017

Ms. Lorena Vaughn, Regional Hearing Clerk (6RC-D)
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Comment Letter on Administrative Orders: **SDWA-06-2017-1110** (Jireh Resources, LLC); **SDWA-06-2017-1112** (Novy Oil and Gas, Inc. (Grayhorse Operating, LLC)); and **SDWA-06-2017-1111** (Warren American Company, LLC)

Dear Ms. Vaughn:

Osage Land & Cattle Co., together with BEPCO, L.P. are submitting the following comments in response to recently posted Administrative Orders to Jireh Resources, Novy Oil and Gas, Inc. – Grayhorse Operating, LLC, and Warren American Company, LLC related to oil and gas operations on the Chapman Ranch in Osage County, Oklahoma. Chapman Ranch is owned and operated by Osage Land & Cattle Co. BEPCO, L.P. and Osage Land & Cattle Co. are part of the Bass Enterprises Companies.

We support the proposed administrative controls based on observations and comments provided below:

- **Timeline of Key Events**
  - Summary of Events Key to Understanding of Concerns
    - Week of Aug 7, 2016 – A stagnant black sheen and aquatic life kill was noticed on Bird Creek at bridge crossing by ranch employees. Sludge-like film observed on shoreline sediment and the plant life had been adversely affected. Notifications made to BIA and USEPA.

- August 16, 2016 – USEPA made initial visit to site. A field reading of >80,000 ppm chloride was noted at the bridge and visible and olfactory indications of brine and oil were noted. Using a meter provided by BIA, ranch personnel continued downstream to conduct a comprehensive assessment of impact to Bird Creek. Initial survey noted a chloride impact extending 4.5 miles downstream from bridge. A second point of chloride readings similar to the bridge was noted where the creek intersects a tributary, about 0.5 miles downstream of bridge (hereinafter referred to a creek intersection). Chloride level was observed at 65,000 ppm. At the conclusion of visit, USEPA called for continued monitoring as their primary response.
- August 30-31, 2016 – Ranch management met with representatives from Jireh Resources, LLC, Warren American, Grayhorse Operating, BIA, and USEPA. The group was briefed on failed integrity at Jireh 18W and a recent failed mechanical integrity test (MIT) at an unnamed Warren well. Visit to area by ranch management indicated a workover rig and fresh cement job at the Jireh 18W injection well and disconnected injection line and rack of new tubing on the Warren American B-9 location.

  The theory of a dumping or surface spill event as potential source was discussed in detail and based on current practices by the operators of using local on-site injection/disposal wells, access to the bridge through ranch resident entrance and lack of turn around or easy egress, operators were quick to agree that a dumping event was illogical.

  A key take-away from initial meeting was that neither USEPA nor BIA was claiming jurisdiction or authority over corrective actions, despite our belief that the watercourse should be protected under the Clean Water Act. EPA mentioned that continued monitoring and inspection would take place. BIA stance was "if anything comes up, let us know." There was no direction of any options to aggressively remediate the sheen or excessive chloride levels.

  August Rainfall: 0.82 inches
- Week of September 15, 2016: USEPA attempts an electromagnetic survey of a small local area near bridge. Several instrumentation problems. Study was deemed inconclusive. No report of findings/conclusions was made available.
- September 27, 2016: Ranch owner management requests more aggressive action and direction from EPA under the Clean Water Act as stream continues to show impact.

  September Rainfall: 3.12 inches
- October 3, 2016: Ranch owner management requests of EPA that the area pools near the bridge be pumped out through a cooperative agreement with the operators. Information was also received from Oklahoma DEQ that the City of Pawhuska sees the creek issue a potential threat to the city's water supply.
- Week of October 3, 2016: 3.2 inch rain event noted on October 4. Creek was flowing over the bridge. Review by an OK DEQ representative on October 5

indicated that "water had previously ran over road at the bridge adjacent to the brine pool. The two foot culverts under the bridge were still shooting full bore and churning that pool and the whole creek downstream was rolling full. As far as flushing out the creek and getting the existing salt out of there, it was about the best case scenario you could hope for."

During this period, samples were also collected from creek and nearby injection wells by EPA for comparison. Results obtained from the FOIA request indicated that a comparison of major cations/anions indicated a strong correlation to Mississippian Chat injection fluids.

- October 16, 2016: EPA returned to site and took field measurements; levels at the bridge were noted at 52,000ppm chloride. A reading of 45,000 ppm chloride was noted at creek intersection.
- October 27, 2016: EPA recorded 70,000 ppm and water temperatures of 100 degrees at bottom of creek at the bridge location. EPA indicated that samples collected earlier in month showed a positive correlation between the Jireh and Warren injection wells and the water in the creek.
- October 28, 2016: Ranch owner management again appeals to EPA for more aggressive action and direction under the Clean Water Act due to continued impact.

  October Rainfall: 6.05 inches

  November Rainfall: 0.38 inches
- December 7, 2016: BIA takes reading at bridge of Bird Creek: 49,900 ppm chloride recorded. A reading of 47,000 ppm chloride was noted at creek intersection.

  December Rainfall: 0.82 inches

  January 2017 Rainfall: 3.22 inches

  February Rainfall: 0.96 inches

  March Rainfall: 2.86 inches
- April 24, 2017: USEPA indicates that formal information requests were submitted related to underground injection control operations of the operators in the area. Also letters were submitted requesting participation in a dye test of injection wells. Data indicates that this study never took place.

  April Rainfall: 12.90 inches
- May 4, 2017: Meeting with US EPA Region 6 Administration staff at bridge site – plan of assessment was outlined. Substantial rain event noted on May 3rd that was over the bridge on May 3, but receded to flowing through culverts on May 4. BIA Readings: 23,000 ppm at bridge and 41,600 ppm at creek intersection.
- Week of May 15, 2017: Grayhorse Operating shuts in Osage 15 SWD and moves in workover rig.
- May 23, 2017: EPA conducts a detailed survey of the creek and begins process of installing continuous monitor probes in Bird Creek. Readings in creek: 3300 ppm at bridge (Station 2), 46,600 ppm at creek intersection (Station 6). Two additional points in creek identified with elevated chloride levels (Stations 4 and 5).

- May 25, 2017: Went to Osage 15 SWD site wile workover crew was on-site and talked with Grayhorse Operating, LLC. Operator mentioned that they knew of potential integrity problem with well in August 2016.
  May Rainfall: 5.36 inches
- June 28, 2017: Field reading at Creek intersection area: 51,000 ppm, 95 deg F.
  June Rainfall: 2.81 inches

- Based on the above information, the ranch management made the following observations:
  - Several cases of failed integrity within various area injection/disposal wells were noted;
  - After large rainfall events capable of significant flushing of creek, chloride levels dropped but then returned. Almost 40 inches of rainfall in less than 1 year and significant chloride levels still persist within creek.
  - Chloride levels at the bridge began slow decline with workover rehabilitation or shut-in at Jireh and Warren injection wells and then experienced a rapid decline after shut-in of Grayhorse #15 SWD.
  - Field observations during May 2017 detailed survey conducted by USEPA indicated that the chloride "hot spots" were located within the stream bed but seemed consistent throughout rain events. There was no correlation to depth of water and the presence of a chloride "hot-spot".

- **Impact or threat to Ranch Property**

Grazing

The area of Bird Creek impacted by the contamination is located in high-quality livestock grazing pastures. Based on recent field measurements made available to the landowner, approximately 3500 acres of pasture land has been off limits to cattle for the purpose of grazing due to the contamination for over a year. Currently, Total Dissolved Solids measurements in localized impacted areas of the creek have ranged from 2,342 ppm to over 44,000 ppm, which according to information received from the Oklahoma Cooperative Extension Service at Oklahoma State University, can adversely affect the overall health of livestock and should be avoided if over 5,000 ppm.

Ecological Habitat – Tall Grass Prairie / Threat to aquatic life

The Chapman Ranch and Bird Creek are situated in one of last remaining areas of a tallgrass prairie eco-system in the world and is adjacent to the protected Nature Conservancy Tallgrass Prairie Preserve. Originally spanning portions of 14 states from Texas to Minnesota, the original tallgrass prairie area has been dramatically reduced by conversion to cropland, leaving less than 4% of the original tallgrass prairie. The Chapman Ranch ownership and nearby ranch owners, like the Preserve, prides itself on maintaining this fully-functioning portion of the tallgrass prairie ecosystem and employs various conservation measures including prescribed burning and well-managed grazing.

The contamination to Bird Creek resulted in a wildlife kill of fish, turtles, crayfish, mollusks, and left at least a one-mile stretch of creek void of any aquatic life for several months. Historic poor management of oil & gas operations has plagued Osage County for years. Waters in Osage County that do not currently meet applicable water quality standards are listed in the 2012 List of Impaired Waters compiled by the state of Oklahoma under Section 303(d) of the Clean Water Act. A total of nineteen (19) Osage County lakes and streams are on the list of impaired waters. One source of impairment for six (6) of 19 impaired streams and lakes in Osage County is listed as Source ID number 102- "petroleum/natural gas activities (Legacy)".

Nearby domestic water wells

Chapman Ranch operations in the area include the use of two domestic water wells located approximately 1600 feet from the contaminated portions of Bird Creek. The wells provide potable water to two ranch homes that are occupied by Chapman Ranch personnel and their families. These wells are approximately 400 feet in depth and have been tested three times by ranch management since the initial discovery in August 2016. There have been minor fluctuations in key indicator cation elements that require continued monitoring since significant change to these cation ratios may indicate a change in groundwater quality. Acting on the side of caution, bottled water has been used for drinking water.

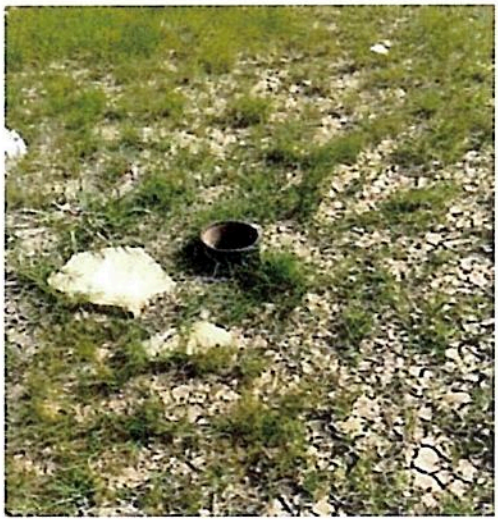
Bird Creek Watershed – City of Pawhuska

The Bird Creek Watershed encompasses an area of approximately 1,137 square miles and extends across 4 counties in Northeast Oklahoma including portions of Osage, Washington, Rogers and Tulsa Counties. The watershed contains fourteen (14) communities, including nearby Pawhuska and other communities within Osage County and extends as far south as Tulsa. The city of Pawhuska's primary and preferred water source intake is from Bird Creek located approximately 10 miles downstream of the Chapman Ranch. Pawhuska City Manager Mike McCartney said that city's water supply sources have not been affected but that "out of an abundance of caution" and the potential threat of a reoccurrence, a switch was made to have Pawhuska Lake, which is fed by Clear Creek, serve as the primary water source instead of a water supply linked to Bird Creek. This has been a significant expense to the City based on verbal discussions with the City.

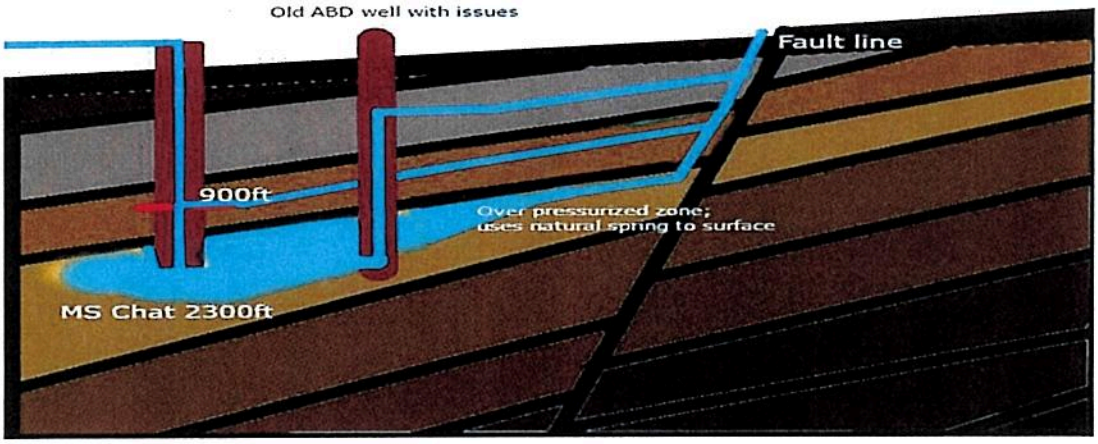
- <u>Abundance of Abandoned Wells in Area – Accountability</u>

Within the area of Chapman Ranch, there are dozens if not hundreds of abandoned wells visible within the pasture areas and an indeterminable number that may lie beneath the land surface. Abandoned wells are potential receptacles for household garbage, dead animals, worn out machinery, and liquid wastes. More importantly, unplugged or improperly plugged wells can act as conduits for the movement of oil, gas, salt water, or other substances into any groundwater strata through which the well may have been drilled, depending on how the well was constructed and its current condition. Through seepage, the substances may enter groundwater strata and adversely impact groundwater quality. Casing corrosion or the absence or

degradation of cement in the annular space around the well casing can also provide holes or openings for pollutant migration to reach groundwater aquifers or even reach the surface waters. In a review of available well data in the immediate vicinity of the Bird Creek /Chapman Ranch area (roughly 3-4 square miles), over 118 well locations were individually reviewed, many drilled prior to 1960 and most of them abandoned. Casing and cementing records were virtually unusable from the database to determine casing string depths or cementing of shallow formations. Photos are provided herein as examples of the numerous abandoned wells that are readily visible in the vicinity of Bird Creek.



Without effective and enforceable plugging program, the abandoned well can easily serve as a conduit for formation fluid migration upward (see sketch below). These fluids can migrate upward via the open abandoned casing or via annular conduits from corroded and poorly cemented casing strings and seep into fresh water aquifers or reach the surface. This is a very plausible explanation surrounding the contamination in Bird Creek and even more plausible with the fact that many wells in the area were drilled in the 1930's, 40's, and 50's. It was not until the mid-1960's, when states enacted regulations to protect fresh water that included proper cementing of casing strings.



It has been documented that the agencies regulating oil & gas development in Osage County have not historically been accountable for the disposition of abandoned wells. In an October 2014 report by the U.S. Department of Interior (USDI) Inspector General's Office, the regulatory agency's policies and procedures were noted as being incomplete, not dated, and not having final approval by the Superintendent. 25 CFR Part 226 gives the agency superintendent significant discretion in managing the Osage oil & gas programs. Specifically, it states the 'lessee shall not shut down, abandon, or otherwise discontinue the operation or use of any well for any purpose without written approval of the superintendent." This example of wording in regulations encourages inconsistent practices by operators, including not properly plugging and leaving wells unsecure and susceptible to corrosion. It should be noted that responsible operators have typically addressed these risks. The USDI further noted that "historically the Council has not plugged wells so that the wells can potentially be operated later as technology advances the ability to recover additional oil and gas."

- **Geology, Permitting and Monitoring Considerations**

Over the past year of involvement in the assessment of the contamination at Bird Creek on the Chapman Ranch, several concerns have been raised around insufficient consideration of geologic formation characteristics within the Mississippian Chat and around the permitting and monitoring practices of injection/salt water disposal wells in the Bird Creek Area. For example, the 2014 USDI report cited minimal analysis is common for review of applications for permits to drill (APD) and there was no adherence to specific standards for drilling or workover approvals, even for injection wells. Without a regulatory interest in formation characteristics such as hydraulic fracture initiation pressure, there is no way to evaluate the safe limitations on injection pressure that would prevent a loss of zone isolation. Loss of vertical zone isolation could threaten shallower formations, including fresh water sources. Further, if a hydraulic fracture were allowed to be created, not only would vertical zone isolation be threatened, but lateral growth of such an induced fracture could transport high pressure injectants (produced water in this case) miles away from the point of injection, perhaps to intersect with natural pathways to groundwater or even the surface that, without the motive force of the injection system, would have been benign. Poor operating practices coupled with a lax regulatory framework, especially in areas of very marginal oil and gas resources, can (and has) led to key factors possible being overlooked. This is a recipe for poor outcomes like we see in this instance at Bird Creek.

Mississippian Chat Reservoir Unit - Geologic Considerations

In review of the basic geology of the Mississippian Chat reservoir, key factors were noted that question the suitability of the Chat reservoir for re-injection of formation fluids or water-flooding production practices. One key principle of disposal wells or injection wells is the disposal/injection interval must be sealed above and below by unbroken, impermeable rock layers and, to be effective, must be homogenous enough to provide a degree of lateral continuity that would safely accommodate such injection volumes. Geologic publications

indicate that the Chat interval exhibits lateral and vertical variations in reservoir properties because of its deposition. Locally, production is driven by matrix properties (porosity and permeability not enhanced by natural fractures) in some areas; whereas, in other areas, natural fractures play a dominant role. On a larger scale, the lack of homogeneity could lead to compartmentalization into small blocks that would be poorly suited to large-scale water disposal.

Available reports on the Mississippian Chat reservoir indicate that the unit is situated at an erosional unconformity between the Pennsylvanian and Mississippian system and is unique because it exists as a weathered or detrital interval of tripolotic or more dense chert at the top of Mississippian sequence. The term "tripolitic" is significant because it refers to a chert that has been highly weathered by meteoric waters (common along unconformities) and which is light-weight because of porosity formed during subareal exposure (i.e., weathering). It is often described as a "soft, weathered chert". Because of its deposition, this unit is susceptible to and frequently associated with fracturing (both natural and induced by injection). Again, it stands to reason that a highly variable, soft and weathered rock sequence that is commonly fractured provides challenges to maintaining vertical formation containment and lateral injection accommodation. To make matters worse, the Kansas Geologic Survey noted that operators often experience adverse permeability behavior during secondary recovery (i.e., injection) in the Mississippian Chat reservoir. This is a situation where natural formation properties make it difficult to inject water into the pore structure of the same zone that is producing oil and gas. In a waterflood project, where water injection into oil producing formations to enhance oil recovery is essential, this challenge can be "overcome" by injecting produced water at a pressure high enough to fracture the rock (higher than frac pressure). This act threatens the vertical containment of the zone and invites growth of the induced fracture in ways unknown and unknowable to the operator.

Formation fluid temperature of the Chat reservoir is a function of depth and the geothermal gradient in a geographic region. In Oklahoma and Kansas, the typical geothermal gradient is 1.5 degrees F / 100 feet of depth). At surface temperature of 75 degrees F, the formation temperature is 112.5 degrees F. This correlates with the observed temperatures recorded in the creek near the bridge.

Reservoir Engineering – Allowable Injection Pressure

A preliminary review of the injection pressures used in the MS Chat injection wells indicates the possibility of down-hole injection pressures exerted on the MS Chat reservoir unit may actually induce fracturing within the unit. This would provide a mechanism by which a formation fluids can disperse out into a network of intersecting fractures or faults that could eventually reach a nearby abandoned well, a nearby well experiencing mechanical integrity issues, or even the ground surface.

Two parameters are needed when assessing the potential effect of down-hole pressures on the Chat reservoir unit:

1. The frac gradient of the Chat reservoir unit; and
2. The calculated bottom hole pressure exerted on the formation.

The frac gradient, expressed in psi/foot, is the pressure required to induce fractures in rock at a given depth. There is no readily ascertainable published information concerning the specific measured frac gradient of the Mississippian Chat reservoir unit in Osage County. However, based on input from multiple petroleum reservoir engineers, an average frac gradient for a reservoir rock generally ranges from 0.5 psi/ft to 1.0 psi/ft. The lower range would represent rock that is weak, soft, or susceptible to fracturing whereas the upper end would represent rock that is hard, dense, and has a well cemented matrix. Based on discussions with geologists and engineers experienced in the Osage County area, the frac gradient within the MS Chat reservoir would likely be in the lower range near 0.5 psi/foot citing conditions similar to those discussed above in the geologic factors section. Given the average depth of the Chat producing interval in the Chapman Ranch area of 2,500 feet, the frac pressure would be approximately 1,250 psi. It is of interest that the frac gradient can be calculated using methods such as a Step-Rate Test but no such data is available for these comments.

The bottom-hole injection pressure exerted on any formation, expressed in (psi), is expressed as:

- pressure exerted at the surface (SP) + hydrostatic pressure of fluid column in pipe (HP) – friction pressure from the movement of fluids down the tubulars; or
  BHP = SP+H-FP (equation 1)

Most injection wells in this area have been assigned limits of 200 psi surface injection pressure and a volume limit of 90,000 bbls/month. As a historical note, this is actually an increase from 100 psi allowable injection pressure and 45,000 bbls/month set previously.

Hydrostatic pressure is a function of the fluid density and total column height of fluid (produced water in this case). Assuming 2500 feet in depth and a Sg of produced water of 1.07 (8.96 ppg or 0.465 psi/ft), the calculated hydrostatic pressure would be 1162.5 psi.

Friction pressure (FP) becomes the last value to consider. This value is based on a number of parameters including pipe diameter, pipe roughness factor, pipe length, flow rate, fluid density and fluid viscosity. In most all cases, 2 7/8 inch tubing is used for the injection wells. Assuming a fluid density of 8.96 lbs/gal, a viscosity of 1 centipoise, and using the depth and diameter of the tubing, the friction loss is calculated at 49 psi.

Application of **equation (1)** would result in a maximum downhole pressure of **1313.5 psi.** See below:

BHP = SP + HP – FP
BHP = 200 psig + 1162.5 psi – 49 psi
BHP = 1313.5 psi

While many operators are assigned this 200 psi limit, there are no reliable rules to govern this. In fact, the federal underground injection control (UIC) rule for Osage Mineral Reserve (40 CFR 147.2900) provides specifications for the injection/ disposal wells in Osage County, including detailed operating requirements for these wells. Under 147.2912(b)(1), a calculation is provided whereby operators can determine the injection limitations. This equation is:

Pm = (0.75-0.433Sg)d (equation 2)

where:
Pm = surface injection pressure at the wellhead in (psi)

Sg = specific gravity of injected fluid (unitless)

D = injection zone depth in feet

Application of **equation (2)** would result in a maximum surface pressure limit of **716.73 psi** and going back to **equation (1)** the bottom-hole injection pressure for the Chapman Ranch area would be as follows:

BHP = SP + HP – FP
BHP = 717 psig + 1162.5 psi – 49 psi
BHP = 1830.5 psi

RESULT: When we compare this to a frac pressure of 1250 psi calculated for the Chapman Ranch area above, the bottom hole pressure in both calculations exceeds the formation frac pressure and the fluid injected into the Chat reservoir unit is being injected at sufficient pressure to induce fractures. Again, these injection conditions exceed the formation's ability to maintain vertical containment and lateral accommodation within the zone. Note that even at **100 psi** surface pressure, the bottom-hole pressure may be aggressively close to formation frac pressure. Therefore, it is plausible (even likely) that the injection pressures allowed 40 CFR 147.2900 result in bottom-hole pressures that can induce fractures within the Chat reservoir.

Mechanical Integrity Testing

40 CFR 147.2900 and individual injection well permits provide the operator with mechanical integrity testing requirements. Per the permit, a mechanical integrity test (MIT) is required prior to initiating operations and every five years. However, 40 CFR 147.2900 provides options to demonstrate mechanical integrity, some of which include simple monitoring of gauges. There are even case-by-case programs approved by the Osage Superintendent. It should be noted that

most injection wells in the Chapman Ranch area are supposed to undergo a pressure test every five years which are reportedly monitored by EPA or Osage Council personnel.

Based on field observations during workover operations, concern was raised over the accuracy and verifiability of the MIT test results. First, a request of available records through the Freedom of Information Act (FOIA) was made to both the BIA and USEPA Region 6. No data was ever received from the BIA and the EPA data was limited. The only MIT data form was on the Jireh 18W well after the 2016 workover was completed. Any other MIT records were not provided with the EPA packet of FOIA information. The only records were on the Osage Tribe web page – Environmental Data Mapper. The MIT data was marginal, but none of the 7 injection/disposal wells identified in the referenced Administrative Orders had current MIT data available. The last passing MIT date was in 2011. Of the MIT records made available, all wells had prior histories of MIT failure. This raises concern over the data being readily accessible and verifiable for the purpose of establishing trends or even current status of any of these wells.

In addition, a concern was noted involving a sequence of events noted with the Grayhorse 15 SWD well. On May 25, 2017, the operator verbally noted to ranch management that the Grayhorse #15 SWD had mechanical integrity problems in August 2016, coincidental to the time that contamination was discovered in Bird Creek. An August 18, 2016 inspection by US EPA Region 6 indicated that the SWD was still pumping and that the gauges were not working properly and pressures could not be verified. Information from the USEPA Annual Disposal/injection Well Monitoring Report indicated that the Grayhorse 15 SWD continued to receive waste water at an average rate of 70,000 bbls/month as late as March 2017. In May 2017, a workover rig began pulling casing and tubing from the well. The tubulars were severely corroded and riddled with holes. Discussions with petroleum engineers indicated that pipe in that condition had likely been deteriorating for many years and would certainly not pass a MIT pressure test.

This raises concern over the accuracy and recommended testing interval of the MIT process under 40 CFR 147.2900. It further raises questions as to compliance with the individual UIC permit (No: 06S1261P5258) that states in Part II (E)(2) – if the well "fails to demonstrate mechanical integrity during a test, or a loss... becomes evident during operation, the operation shall be halted immediately and shall not be resumed until the Regional Administrator gives approval to recommence injection. " Available information indicates potential issues arose in August 2016, but the well continued to operate for several months.

- **Final Comments**

  Osage Land & Cattle, LLC and BEPCO, L.P. have been closely following the activity, monitoring, and assessment work that has been on-going since last year. We approve the administrative orders **SDWA-06-2017-1110** , **SDWA-06-2017-1111** and **SDWA-06-2017-1112** as an appropriate course of action because of evidence highlighted above that suggests contamination observed in Bird Creek is likely associated with injection into the Mississippian Chat reservoir and mechanical integrity failures in the injection and disposal wells in the area that has allowed for formation water to no longer be controlled due to the existence of abandoned wells, faults and fractures in the area that have reached the surface in the base of the creeks and various discrete points.

  While we feel strongly toward approval of the Administrative Order, we also seek consideration from the US EPA to also apply additional administrative controls in the permitting, testing, and monitoring that addresses improved preventative requirements and establishes a management and enforcement process that can be verifiable and accountable for operations, including:

  - Well construction
  - SWD/injection permitting
  - SWD/injection well monitoring & reporting
  - P&A / orphan well program management

If you have any questions or desire additional information, please feel free to contact Bill Biehl at (817) 821-8016 or wbiehl@basspet.com or R.D. Farr at (918) 338-2332 or rdfarr@elcoyote.com .

Respectfully submitted:

Bill Biehl, PG
EH&S Manager
BEPCO, L.P (on behalf of Osage Land & Cattle Co.)

Ct: R.D. Farr, Osage Land & Cattle Co.