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October 7, 2019

Wyoming Water and Waste Advisory Board
c/o Ms. Gina Thompson
Wyoming Department of Environmental Quality
200 West 17th Street
Cheyenne, Wyoming 82002

Re: Comments to Proposed Rulemaking: WQRR Chapters 14 and 28

Dear Wyoming Water and Waste Advisory Board:

We appreciate the opportunity to provide comments to the proposed rules and apologize for the fact that we cannot attend the October 17, 2019 public hearing due to an unavoidable scheduling conflict. In way of a short background so our comments can be reviewed in context, we have been involved with the design, permitting and operation of Commercial Oilfield Wastewater Disposal Facilities (COWDFs) in Wyoming since 2011. We have found the current procedure for permitting to be fairly efficient and the current *Guidelines: Commercial Oilfield Wastewater Disposal Facilities (COWDF)* provides good guidance for the design, permitting and operation of such facilities; however, we believe that consolidation of the rules is a positive step.

It appears that the proposed changes to Chapter 14 are basically housekeeping changes. Our comments to the proposed Chapter 28 rules will be presented by referencing sections as included in the draft dated September 6, 2019 followed by our comments in Italics.

Section 3. Timing of Compliance with These Regulations.
"Any Chapter 3 individual permit issued for facilities subject to this chapter prior to the effective date of these regulations shall remain covered under those permits. New construction or modification of existing permitted facilities must obtain authorization under a new permit after the effective date of this regulation."

We believe that the word "modification" is a bit vague and understand the need for regulatory flexibility; however, we recommend that the some clarity be added so that minor and insignificant modifications to previously permitted facilities will allow the facility to

continue to operate under its existing permit. Requiring new permits for existing facilities due to minor modifications would likely trigger an avalanche of permit applications and create a regulatory log jam.

Section 8. Annual Reporting Requirements

"(a) The permittee shall submit to the Division by April 1 of each year an annual report that includes:

….

(iv) A discussion and analysis of the leak detection monitoring results and pond analysis including a graph of the last five (5) years of data in a format approved by the Administrator; and …"

Most leak-detection monitoring results are either dry or wet sumps so the initial results are binary. We are unclear as to what leak-detection monitoring results should be graphed. Is the intent to plot water-quality data and leak rates if water is observed in the sumps? Some clarification here would be very helpful.

Section 9. Engineering Design Report.

"(a) An engineering design report is required for each project and shall include:

(i) A description of the facility site and location including:

….

(D) The distances from occupied dwelling buildings or school buildings; …"

Most of the COWDFs we have permitted are quite remote, so we recommend setting some sort of maximum distance such as within 1.5 miles from the proposed COWDF boundary. This would add a buffer to the current 1-mile radius for residences.

"(b) Engineering design drawings are required for each project and shall include:

…

(ii) The following requirements:

…

(E) Soil and subsurface geological characteristics; …

(G) Flood protection indicating predicted elevation of 25- and 100-year flood stages; …"

In our experience item 9.b.ii.E is accomplished via a geologic cross section with the pond geometry superimposed on the geologic cross section. Groundwater observations, if present, are usually shown on this cross section. If this is the intent, we recommend adding those requirements and stating that should be in the form of a scaled geologic cross section.

We were a bit confused by item 9.b.ii.G since these facilities should be sited outside the 100-year floodplain. It would be helpful to either remove this item so applicants do not get the impression that COWDFs can be constructed in floodplains or to add some clarifying language regarding the intent of this requirement.

Section 10. Minimum Design and Construction Standards.
"…
(b) For receiving facilities, phase separation facilities, aeration/enhanced evaporation systems, and active wastewater treatment facilities, the application shall include:

(i) At least one of the following components:
  (A) Data obtained from a full scale, comparable installation that demonstrates the acceptability of the design;
  (B) Data obtained from a pilot plant operated under the design condition for a sufficient length of time to demonstrate the acceptability of the design;
  (C) Data obtained from a theoretical evaluation of the design that demonstrates a reasonable probability of the facility meeting the design objectives;
  (D) An evaluation of the flexibility of making corrective changes to a constructed facility that does not function as planned; and
  (E) An evaluation of the risk and potential costs of the failure of the proposed facility or technology.

(ii) For receiving facility and phase separation facility designs, a demonstration that the proposed facilities will remove liquid hydrocarbons from produced water before it is discharged to the evaporation cells."

We hope that the permit reviewers understand that most of the receiving headworks are relatively simple and primarily operate via gravity flow and gravimetric separation. Therefore, there are relatively few data points to satisfy 10.b.i other than there was no visible oil or little visible oil prior to discharge to the settlement pond that almost all designs include between the receiving headworks and the evaporation ponds. The regulation is performance driven in that visible oil should not be present on the evaporation ponds, and if observed it must be immediately removed.

Regarding 10.b.ii, it is unclear how this can be demonstrated before a facility goes into operation as water delivered to the COWDFs varies significantly by region and season;

therefore, facilities must be operated fairly dynamically. Again, the regulation is performance driven in that visible oil should not be present on the evaporation ponds, and if observed it must be immediately removed. Therefore, 10.b.ii may not be needed and a demonstration of operational success will not occur until the receiving headworks has been put into operation.

Section 10. Minimum Design and Construction Standards.
"…
(c) The facility design shall meet the following earthwork standards:
(A) Rocks larger than six (6) inches in length shall not be placed within five (5) feet of the interior slope of any pond embankment. …"

We suggest adding a requirement that rocks larger than ½ inch in diameter or any other material that could damage the geomembrane shall be removed from the surface to be covered with the geomembrane.

Section 10. Minimum Design and Construction Standards.
"…
[Line 428] (c) The facility design shall meet the following liner base, primary and secondary liner, and leak detection system standards: …

(i) All ponds shall be constructed with a compacted clay secondary liner base or a geosynthetic clay secondary liner base that is contoured to include individual sub-cells that can be isolated if a leak is detected, as required below in paragraph (iv)(C)(I).

(A) Compacted clay secondary liner bases shall be a minimum of one (1) foot thick with a maximum permeability of 1 X 10^{-5} cm/sec and shall be constructed with maximum ***compacted*** lifts of one-half (1/2) foot. …

(iv) The leak detection system shall include drainage layers between the primary and secondary liners that shall have a minimum hydraulic transmissivity of one (1) gpm/foot. …

(C) Perforated or slotted collection lines shall be installed in the drainage layer arranged to create sub-cells with a maximum area of two (2) acres or less. …

(II) No portion of the drainage layer should be more than 100 feet from a collection line."

*We believe that line 428 should be **(d)** rather than **(c)**. We also recommend that the word "compacted" be inserted as shown above in bold Italics in 10.c[d].i.A.*

We recommend that the collection line distance included in 10.c[d].iv.C.II be increased to 140 feet since this distance has proven effective in the past, is more constructible for a typical 400 by 600 foot pond, and allows the leak-detection system to function effectively.

Section 11. Monitoring and Reporting Requirements.
"…
(c) Baseline groundwater quality shall be established for any unconfined aquifer at the site prior to any water being placed in the ponds. All wells owned or developed by the common ownership controlling the facility shall be sampled and tested one (1) time for the parameters listed in Water Quality Rules and Regulations, Chapter 8, Table 1. …"

We recommend that this requirement be modified to reflect that fact that many facilities are permitted in areas where groundwater is never observed during the geohydrologic assessment. For example, a site with 23-foot deep ponds will have a typical pond bottom that is somewhere in the neighborhood of 15 or less below grade so if groundwater is not observed to 35 feet, that should be sufficient information for permitting and leak-detection monitoring purposes. In that case, there is no groundwater to sample. This wording could be revised with a clause "that if groundwater is present in …"

It is also unclear as which Underground Water Class should be used to implement the analyte list found in Chapter 8 Table 1. We recommend that some additional clarification be provided since the list of analytes varies with water class. We also recommend that the list of analytes be tailored to more closely match possible impacts associated with a release from a COWDF, similar to the current analyte list included with recent Permits to Construct issued by the Wyoming Department of Environmental Quality, Water Quality Division.

Section 12. Operation and Maintenance Plan.

In our opinion the section included in the proposed rule is appropriate for a typical wastewater treatment plant, but is not practical for a COWDF. We have typically provided the following types of information:

1. *Staffing and management structure;*
2. *Planned work and facility operation schedules;*
3. *Staff training and qualifications;*
4. *Wastewater receiving procedures including non-conforming loads as well as record keeping and reporting procedures;*
5. *Process and instrumentation diagram; and*
6. *Maintenance and inspection procedures.*

We also recommend including a requirement that a contingency plan designed to minimize hazards to human health or the environment from fires, explosions or unplanned sudden or non-sudden release of waste or waste constituents to soil, surface or groundwater be

included with the Design Operations and Closure Plan. This plan should include procedures for notifying the appropriate State or local agencies with designated response roles described in this plan. The contingency plan should also include reporting thresholds and response procedures for spills, fires, explosions and other possible failures as well as record keeping procedures. Leak detection monitoring and response procedures should also be included in this plan.

We very much appreciate the opportunity to comment on the proposed rules during the rule-making process.

Sincerely,
PARAGON CONSULTING GROUP, INC.

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DMR/SAR:dmr2

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