Transmitted via the DEQ's Public Comment Portal

February 18, 2020

Jason Thomas
Department of Environmental Quality
Water Quality Division
200 West 17th Street
Cheyenne, WY 82002

RE: COMMENTS ON THE REVISED DRAFT PERMIT FOR AETHON ENERGY (MONETA DIVIDE) DISCHARGE PERMIT # WY0002062.

Dear Mr. Thomas:

These comments are submitted on behalf of the Wyoming Outdoor Council, Powder River Basin Resource Council, Natural Resources Defense Council, and National Audubon Society in response to the Department of Environmental Quality's public notice dated January 17, 2020, inviting comments on the revised draft discharge permit for Aethon Energy's Moneta Divide oil and natural gas field.

Aethon's discharge permit was first proposed for renewal in March, 2019. Hundreds of public comments were received by the DEQ during the comment period, the vast majority of which were highly critical of the proposed permit renewal. Comments expressed a range of concerns about potential impacts to water quality in Boysen Reservoir and its tributaries, as well as to the Class 1 Wind River. As explained in its January, 2020 public notice, the DEQ has revised the proposal in an effort to address the issues and concerns raised by affected stakeholders. The notices states, in part, that:

> The allowable salt load from this facility will now remain unchanged from the previous existing permit, capped at 908 tons per month. This is the historic average output level for the project over the course of decades in operation. In addition, the revised draft permit includes several new requirements which are not

included in Aethon's existing permit. These new requirements are intended to address public comments related to monitoring and control of water quality at the facility and downstream.

The specific changes proposed by the DEQ include the following:

1. A compliance schedule for Chloride final effluent limit of 230 mg/L.
2. The addition of outfall 016.
3. Additional instream monitoring locations and new sampling requirements in Alkali and Badwater creeks and in Badwater Bay.
4. The addition of sampling requirement for BTEX constituents at the outfalls and in Alkali Creek, along with a commitment to add effluent limits in the next permit term if monitoring shows a reasonable potential for violations of water quality standards.
5. Including sampling requirement for trace constituents of well maintenance chemicals and hydraulic fracturing fluids.
6. Adding nutrient monitoring requirements for total nitrogen, total ammonia-nitrogen, nitrate + nitrite- nitrogen, total phosphorus, and orthophosphate-phosphorus in support of Boysen Watershed nutrient management planning.
7. Adding effluent limits at all outfalls for Temperature, Total Sulfide, Radium226+228, Total Recoverable Barium.
8. Including Whole Effluent Toxicity testing.
9. Revised language ensuring agency access to the facility.

We commend the DEQ for responding thoughtfully to public comment, and support many of the proposed revisions. However, based on careful review and analysis, we believe that the revised permit fails to satisfy applicable legal requirements, resulting in the continuation of unlawful discharges of pollution entering the state's surface waters. Given Aethon's violations of its existing permit, DEQ's regulations prohibit it from renewing the permit. Moreover, the permit continues to rely unlawfully on a discharge that may have existed in 1975 justify inadequately controlled discharges by a new operator.

Additional revisions –some mandated by law and others within the discretion of the DEQ-- are needed to safeguard Boysen Reservoir and its tributaries from the impacts of oil field wastewater. As discussed in detail below, those changes include reducing salt loads into Boysen Reservoir; adding effluent concentration limits for TDS to protect agricultural and wildlife uses; including effluent limits for chloride to restore and protect aquatic life in receiving waters; adding effluent limits for BTEX constituents; adding *chronic* WET testing; placing an additional monitoring station on Badwater Creek immediately upstream of Badwater Bay to detect pH values; as well as a number of other changes required to address fisheries and aquatic life concerns.

We also identify and discuss below several significant issues requiring additional clarification and analysis. Lastly, we recommend that DEQ commits to a timeframe to implement a clean-up plan for Boysen tributaries that have been degraded by decades of oil field pollutants.

I. DESCRIPTION OF PARTIES

Powder River Basin Resource Council was founded in 1973 by rural landowners and concerned citizens working to protect their land, water, and air. For 47 years our citizen-based organization has been dedicated to civil society and to the stewardship of Wyoming's human and natural resources. We are committed to community organizing, leadership development, and the empowerment of citizens.

Established in 1967, the Wyoming Outdoor Council is the state's oldest and largest independent conservation organization. Our mission is to protect Wyoming's environment and quality of life for future generations.

The mission of the National Audubon Society is to protect birds and the places they need, today and tomorrow.

The Natural Resources Defense Council's purpose is to safeguard the Earth: its people, its plants and animals and the natural systems on which all life depends. We work to restore the integrity of the elements that sustain life–air, land and water–and to defend endangered natural places.

Our organizations all have members who use and rely on the waters affected by the proposed discharges. We are not opposed to the expansion of the Moneta Divide oil and natural gas field, but believe that any further development must be carried out in a manner that complies with the law, protects the health and safety of Wyoming's residents, meets water quality standards, and respects the rights of downstream water users.

II. DISCUSSION

A. The Draft Permit Does Not Comply with the Water Quality Division's Rules and Regulations Governing Point Source Discharges.

As discussed in detail below, the revised draft permit fails to comply with rules governing the renewal of discharge permits; fails to demonstrate that the produced water is of good enough quality for livestock and wildlife, and that it is actually being put to that use; and fails to ensure that water quality standards in the receiving waters will be met.

1. Applicable Regulatory Requirements.

Chapter 2 of the Department of Environmental Quality Water Quality Division's Rules and Regulations regulates point source discharges to waters of the State. Among other things, Chapter 2, Section 5 requires technology-based effluent limitations (TBELs) to be included in all permits. Ch. 2, Section 5(c)(iii)(A). For oil and gas production facilities like Aethon's, Section 5 also requires compliance with additional technology based effluent limits "as described in Appendix H." Ch. 2, Sec. 5(c)(iii)(B)(III).

In addition to technology-based limits, Chapter 2 requires water quality based limitations when "necessary to ensure that violations of water quality standards do not occur." Ch. 2, Sec.

5(c)(iii)(C). Water quality based effluent limitations (WQBELs) "shall be established for constituents in discharges determined to have a reasonable potential of adversely impacting uses of surface waters of the state or of causing violations of water quality standards." Ch. 2, Sec. 5(c)(iii)(C)(I).

Chapter 2 also contains requirements that govern the review and renewal of existing permits. *See* Ch. 2, Section 10. Among other things, the DEQ must "insure" that the permittee is in compliance with the terms and conditions of the expiring permit, and that applicable water quality standards are protected.

Accordingly, under Wyoming's regulatory scheme, permits authorizing the discharge of produced water from oil and gas production facilities must contain applicable TBELs and any WQBELs needed to meet water quality standards contained in Chapter 1; comply with all permitting requirements in Chapter 2 including additional conditions set forth in Appendix H; and satisfy the permit review and renewal requirements contained in Section 10.

Key regulatory components of Appendix H that apply to Aethon's discharge include:

- The produced water discharged into surface waters of the state shall be of good enough quality to be used for wildlife or livestock watering or other agricultural uses and actually be put to such use during periods of discharge. App. H(a)(i).

- The produced water discharge must not contain toxic materials in concentrations or combinations which are toxic to human, animal or aquatic life. App. H(b)(i).

- Measures must be implemented to minimize erosion of the drainage at the point of discharge. App. H(b)(iv).

- Discharges of produced water must not contain substances that will settle to form sludge, bank or bottom deposits in quantities sufficient to result in significant aesthetic degradation, significant degradation of habitat for aquatic life or adversely affect public water supplies, agricultural or industrial water use, plant life or wildlife. App. H(b)(v).

- Discharges of produced water may not result in the formation of a visible hydrocarbon sheen on the receiving water. App. H(b)(vi).

- An effluent limitation of 10 mg/l for net oil and grease shall apply. App. H(c)(v).

- The discharge of waste pollutants into surface waters of the state from any source (other than produced water) associated with production, field exploration, drilling, well completion, or well treatment (i.e., drilling muds, drill cuttings, and produced sands) is expressly prohibited. App. H(b)(lx).

- Discharge permits must contain effluent limitations for chloride, sulfate, total dissolved solids (TDS), specific conductance, and pH. Appendix H(b)(vii).

Appendix H contains a provision that allows the DEQ to modify the above-referenced effluent limits on a case-by-case basis "for existing permits where the original permit was submitted prior to September 5, 1978" (*see* Appendix H(c)(i)) but also contains a critical safeguard to limit the possibility that a modification of an effluent limit granted by the DEQ will violate Wyoming's water quality standards: *"In no case will a modification of the effluent limit described above be permitted which would result in a violation of Wyoming Water Quality Rules and Regulations, Chapter 1."* App. H(c)(iii) (emphasis added). As discussed below, the revised draft permit fails to satisfy the applicable regulatory requirements.

2. The Revised Draft Permit Fails to Meet the Regulatory Requirements.

The permit proposed by the DEQ to authorize Aethon to discharge waste water to the surface fails to comply with applicable regulations in Chapter 1, Chapter 2, and Chapter 2 Appendix H. Under these circumstances the DEQ may not lawfully approve Aethon's proposed discharge permit.

a. Violations of the Existing Permit Precludes Renewal.

Chapter 2 of Wyoming's Water Quality Division Rules and Regulations requires state regulators to consider whether an entity has violated its permit when reviewing a permit renewal request. Chapter 2, Section 10(c). Specifically, the regulations require that the DEQ review a renewal request "in light of the existing permit" and that DEQ uses both the renewal request information provided by the permittee and "information available to the administrator bearing on the subject permit . . . ." *Id.* DEQ must use this information to "insure" three conditions exist: "(i) [t]hat the permittee is *in compliance with or has substantially complied* with all the terms and conditions of the expiring permit or authorization; (ii) [t]hat the *discharge is consistent with applicable effluent standards and compliance schedules, water quality standards, and other legally applicable requirements* imposed under these regulations; and (iii) [t]hat the *administrator has up-to-date information on the permittee's discharge*, either pursuant to the submission of new forms or pursuant to monitoring records and reports submitted to the administrator by the permittee." *Id.* (emphasis added). These conditions do not exist because Aethon has not complied with its permit, and its discharges have not complied with legally applicable requirements. Therefore, DEQ cannot renew permit WY0002062.

The permittee, Aethon, has repeatedly failed to comply with the conditions of permit WY0002062. Discharge Monitoring Report (DMR) data sets from the Environmental Protection Agency's Enforcement and Compliance History Online (ECHO) database reveal fifteen violations of effluent limits during monitoring periods ending May 31, 2015 to December 31, 2019. Aethon violated the permit effluent limits for dissolved iron, dissolved zinc, oil and grease, and pH. *See* Appendix A for attached DMR report. The DEQ itself has identified instances where Aethon violated its permit and water quality criteria. On December 17, 2019, the DEQ issued a Letter of Violation (LOV) to Aethon for the presence of black sediment deposits, water surface foams, mineral deposits, and free oil accumulations in Alkali and Badwater Creeks. A copy of the LOV is included in Appendix A. Aethon is aware of these violations as indicated by its January 16, 2020 response. *See* Appendix A, Aethon's response to LOV. These examples demonstrate that Aethon is not in compliance or substantial compliance with the permit limits in

WY0002062 or Wyoming's Water Quality Regulations. As a result, the DEQ cannot "insure" that the above conditions, required by Section 10(c) of Wyoming's Water Quality Regulations, exist and thus, it cannot renew permit WY0002062.

b. The Draft Permit Fails to Meet the Legal Criteria for the Discharge of Produced Water.

Federal and state water quality regulations require that the "produced water shall be of good enough quality to be used for wildlife or livestock watering or other agricultural uses and actually be put to such use during periods of discharge." *See* 40 C.F.R. Part 435 Subpart E., Ch. 2, Appendix H(a).[1] In this case, however, the DEQ proposes under Appendix H(c)(iii) to waive an essential effluent limit required by the regulations to ensure that produced water is of good enough quality; specifically, the maximum effluent *concentration* limit for total dissolved solids (TDS) would be waived and replaced with a *load* limit of 908 tons per month for all outfalls, 001-016.

Comments submitted by the public on the initial draft permit raised concerns that produced water containing total dissolved solids (TDS) concentrations well above the maximum limit specified in Appendix H would not be of good enough quality for livestock and wildlife watering, and questioned whether the produced water would actually be put to use. In response, the DEQ offered a letter from a landowner, Robert L. Hendry, purporting to address these concerns. *See* DEQ's Summary of Public Comments on Initial Draft Permit WY0002062 and WDEQ Response at pages 3 and 5.[2]

i. The Produced Water is Not of Good Enough Quality and is Not Being Put to Actual Use.

Other than Mr. Hendry's unsworn letter, the DEQ provides no evidence whatsoever that produced water containing high levels of TDS that exceed the maximum limits in Appendix H is of good enough quality for wildlife. In addition, Mr. Hendry's letter –while indicating that his livestock use water in various pits—does not demonstrate actual use of the *produced water*. The DEQ has failed to demonstrate compliance with the fundamental requirements of Appendix H and 40 CFR Part 435 Subpart E.

Mr. Hendry's letter makes reference to several pits containing water used by his cows, but does not explain the relationship of those pits to the outfalls described in the discharge permit. Which outfalls supply water to those pits? How far from the outfalls are the pits located? Do the pits contain water from other sources, such as springs, rainfall and/or snowmelt that may provide dilution? The produced water becomes available for wildlife and presumably for cattle

[1] For a discussion of the application of technology-based and water quality-based effluent limits required to ensure that produced water is of good enough quality for livestock and wildlife watering, see *See* EPA Region 8, Response to General Comments, available at https://www.epa.gov/sites/production/files/2017-01/documents/wy-0025232-wesco-operating-winkleman-dome-response-to-comments.pdf.

[2] The DEQ Director also addressed these issues in his response to a request for investigation submitted by WOC and PRBRC. *See* Appendix A, Complaint and Request for Investigation and DEQ Response.

that have access to the outfalls, the moment it exits the outfalls and touches the ground. The rules require that the *produced water* be of good enough quality; the fact that water in pits --whose locations and relationship to outfalls is not explained-- is alleged to be good enough quality is not dispositive.

As noted above, Appendix H requires two fundamental findings. First, that the produced water shall be of good enough quality to be used for wildlife or livestock watering or other agricultural uses. Second, the produced water shall actually be put to such use during periods of discharge. Neither Mr. Hendry's letter, nor the explanation provided by the Director in his response to the Complaint and Request for Investigation, demonstrate compliance with those requirements. There is no information in Mr. Hendry's letter or the DEQ's response showing any relationship between Pits #5, #6 and #7 and the outfalls. Which of the four flowing outfalls supply produced water to the pits? How far are the pits from the outfall? Is produced water entering the pits diluted by any other sources such as rainfall or snowmelt? Are the pits surrounded by fence?

Moreover, even if it had been properly determined that produced water from the existing *operating* outfalls 001, 003, 006 and 009, supply the water in Pits 5, 6 and 7, and that the water in the pits consists exclusively of the produced water from Aethon's outfalls undiluted by other sources, the draft permit fails to address the good enough quality and actual use requirements pertaining to not-yet-constructed outfalls 014, 015, and 016 and constructed but not currently operating outfalls, 002, 004, 005, 007, 008, 010, 011, 012, and 013. *See* 2019 Discharge Monitoring Reports for permit WY0002062, available on the DEQ's website: https://paperdmr.wyo.gov.

The requirements contained in Appendix H and Part 435, Subpart E apply to each and every outfall --*at the outfall*— where the produced water first becomes available for use by wildlife and livestock. The good enough quality requirement applies to the *produced water* (i.e., the effluent leaving the pipe) not to produced water that may have been diluted or mixed with other water contained in the pits discussed in Mr. Hendry's letter. And what may be considered good enough quality at one outfall does not demonstrate that the effluent from a different outfall is also of good enough quality. The DEQ has not demonstrated, or even attempted to demonstrate, that the produced water flowing, or which might in some future time flow, from currently inoperative and/or not-yet-constructed outfalls satisfies the quality and use requirements. Only four outfalls are currently flowing in the project area.

With all due respect to Mr. Hendry, anecdotal evidence –especially from an individual who reportedly stands to gain financially from the development— that livestock have consumed the produced water "with no issues at all" cannot be relied on by DEQ as evidence that the "good enough quality" standard is being met. This is especially true in light of the DEQ's own report cited in our earlier comments on the initial draft permit stating that much lower levels of TDS may be harmful to livestock. *See* Water Quality for Wyoming Livestock & Wildlife, A Review of the Literature Pertaining to Health Effects of Inorganic Contaminants, at 50 (hereinafter "2007 water quality report"). Available at: http://www.wyomingextension.org/agpubs/pubs/B1183.pdf

Table 2 of Aethon's application shows a TDS concentration of 5940 mg/L as representative of the quality at each of the outfalls. Yet the DEQ's 2007 water quality report cautions that concentrations well below 5,000 mg/L are a cause for concern:

> Total dissolved solids in drinking water serve as a very poor predictor of animal health. … We do not recommend relying upon TDS to evaluate water quality for livestock and wildlife; however, if no other information is available, TDS concentrations less than 500 mg/L should ensure safety from almost all inorganic constituents. Above 500 mg/L, the individual constituents contributing to TDS should be identified, quantified, and evaluated.

See DEQ 2007 Water Quality Report at 50. Despite this warning, the revised draft permit eliminates the effluent concentration limit for TDS, resulting in no limit whatsoever on the concentration of TDS permitted in the produced water. With no limits on the concentration of TDS in the draft permit, and evidence of TDS concentrations in the produced water greatly exceeding the limits contained in Appendix H, it is impossible for the agency to properly conclude that the produced water is of good enough quality for livestock and wildlife. The absence of evidence in the draft permit satisfying the required quality and use requirements precludes issuance of a final permit.

ii. DEQ Cannot Waive the TDS Effluent Limit Contained in Appendix H without additional analysis demonstrating that the produced water is of good enough quality for wildlife and livestock use.

As noted above, the revised draft permit waives the technology based effluent limit (TBEL) of 5,000 mg/l contained in Appendix H for TDS, and replaces it with a load limit of 908 tons per month. *See* Statement of Basis at 4. Importantly, information contained in Aethon's permit application shows that TDS levels in the effluent are much higher than the maximum concentration permitted in Appendix H, yet the DEQ provides no evidence that produced water containing TDS concentrations exceeding the maximum concentration limits specified in Appendix H be of good enough quality for livestock and wildlife.

The DEQ-funded 2007 review of the pertinent literature concluded that TDS concentrations in excess of 5,000 mg/L may be harmful to livestock and wildlife, and recommended that "the individual constituents contributing to TDS should be identified, quantified, and evaluated" when TDS levels exceeded 500 mg/L. *Id.*

In light of these findings, the lack of any TDS effluent concentration limit in the revised permit, coupled with produced water containing TDS concentrations much higher than the maximum limits specified in Appendix H, raise substantial doubts about whether the produced water is of good enough quality for livestock and wildlife use. To address that concern, the DEQ must prepare a reasonable potential analysis for TDS providing evidence that the produced water containing much higher concentrations of TDS than authorized in Appendix H(b)(vii)(C) is of good enough quality for livestock and wildlife. The approval of Aethon's permits without that

analysis and demonstration would violate the DEQ's rules and be arbitrary and capricious on its face.

As explained by EPA, the effluent concentration limit for TDS was based on "research and data concerning the effects of produced water on livestock and wildlife to determine what level of effluent could be considered "of good enough quality." See EPA's Response to General Comments on Permits WY-0020338, WY0024953, WY0024945, WY0025232, WY0025606, March 9, 2015, available at: https://www.epa.gov/sites/production/files/2017-01/documents/wy-0025232-wesco-operating-winkleman-dome-response-to-comments.pdf. Notably, DEQ fails to reference any research or data that might even remotely suggest that produced water containing TDS levels in excess of the concentrations specified in Appendix H is of good enough quality for livestock and wildlife. Indeed, the only evidence offered to support the DEQ's contention that the produced water is of good enough quality for livestock and wildlife is a letter by Mr. Hendry claiming that he has seen "no issues at all" with livestock using the water.

TBELS for produced water are based on effluent limitation guidelines (ELG) published by EPA in accordance with Section 304(b) of the Clean Water Act. The ELG for oil and gas productions facilities is contained in 40 CFR Part 435, Subpart E — Agricultural and Wildlife Water Use Subcategory. Specifically, the ELG provides at 40 CFR § 435.50 that produced water may only be discharged if it is 1) of good enough quality to be used for wildlife or livestock watering or other agricultural uses, and 2) is actually put to that use. As noted by EPA's response to comments document:

> [t]he TBELs EPA has developed for sulfate, specific conductance, chloride and TDS are based on the latest research, contained in the administrative record, concerning the effects of these pollutants on agriculture and wildlife use. The limits ensure that animal consumption of the discharged water will not cause acute or chronic health effects that would render the water unsuitable for agricultural or wildlife use.

The EPA's effluent limit for TDS in produced water is identical to the limit contained in Wyoming's Appendix H, 5,000 mg/l.

The DEQ has presented no scientific evidence of any kind confirming that the higher TDS levels contained in the produced water are safe for wildlife and livestock use. The letter from Mr. Hendry claiming that his "livestock have used the water with no issues at all" is not a substitute for scientifically supported conclusions. Because the produced water contains TDS concentrations significantly higher than the limits contained in Appendix H, and because there is no scientific evidence presented in the revised draft permit showing that produced water containing higher concentrations of TDS is of good enough quality for livestock and wildlife, it is incumbent on DEQ to demonstrate through a reasonable potential evaluation that the produced water discharged by Aethon is safe for wildlife and livestock. Without an analysis supporting these findings, renewal of the permit is unlawful.

iii. DEQ Cannot Lawfully Modify Effluent Limits Required by Appendix H if Such Change Would Violate Water Quality Standards.

Appendix H provides that: "In no case will a modification as described in paragraph (c)(1) or (c)(ii) of this appendix be permitted which would result in a violation of Wyoming Water Quality Rules and Regulations, Chapter 1." Ch. 2, Appendix H(c)(iii). The "modified" effluent limit proposed in the revised draft permit for TDS --908 tons per month instead of 5,000 mg/L-- would cause violations of water quality standards, and therefore may not be permitted.

Impacts to agricultural and wildlife uses.

Analysis of water quality data collected by DEQ from Alkali Creek show that TDS concentrations *in the creek* exceed the maximum limit specified for *produced water* in Appendix H *at the outfall*. *See* Appendix A, DEQ water quality sampling data showing instream TDS concentration of 5568 mg/L. Alkali Creek is a Class 3B stream with the following designated uses: aquatic life other than fish, recreation, wildlife, industry, agriculture and scenic value. *See* DEQ Ch. 1, Section 4(c). Chapter 1 explains that agriculture use includes livestock watering. Ch. 1, Sec. 3(a). Similarly, wildlife use "includes protection of water quality to a level which is safe for contact and consumption by avian and terrestrial wildlife species." Ch. 1, Sec. 3(h).

TDS concentrations *in the stream* exceed the levels specified in Appendix H that have been deemed safe by DEQ for wildlife and livestock watering and therefore are likely to impact designated uses in Alkali Creek. As discussed above, under DEQ rules, a discharge permit may not be issued or renewed if it would violate a water quality standard. Chapter 2, Section 10(c)(ii). *See also*, Chapter 1, Section 5, Standards Enforcement.

In order to determine whether higher concentrations of TDS present in the produced water entering Alkali Creek will violate Wyoming water quality standards in Chapter 1, the DEQ must conduct a reasonable potential evaluation to determine whether the water uses described in Chapter 1, Section 3 pertaining to Alkali Creek, including in particular, agricultural and wildlife uses, will be protected. *See* Chapter 2, Section 5(c)(iii)(C). The DEQ may not renew Aethon's discharge permit until a reasonable potential analysis has been completed, and appropriate water quality based effluent limits have been established, to protect designated uses in Alkali Creek.

Impacts to aquatic life.

High concentrations of TDS and other pollutants in the effluent have harmed aquatic life in Alkali Creek. *See* Memorandum from Professor Harold Bergman and Dr. Joseph Meyer, dated February 18, 2020, appended hereto in Appendix A, and fully adopted and incorporated by reference herein. The proposed waiver of the Appendix H effluent concentration limit for TDS of 5,000 mg/L will continue to cause harm to aquatic life in Alkali Creek, threatening its aquatic life use designation in violation of Appendix H(c)(iii). As noted above, this section provides that: "In no case will a modification as described in paragraph (c)(i) or (c)(ii) of this appendix be permitted which would result in a violation of Wyoming Water Quality Rules and Regulations,

Chapter 1. For this reason, the modification of the TDS effluent limit proposed by DEQ in the revised draft permit is unlawful and cannot be permitted.

B. The DEQ's Proposal to "Grandfather" Harmful Pollutants is Unlawful.

For several decades, the DEQ has authorized the continuing discharge of massive quantities of salt-laden produced water from the Frenchie Draw field into Boysen Reservoir via Alkali and Badwater creeks. Previous discharge permits issued by the DEQ show that volumes of produced water and salt loads discharged from this field peaked in 2009–10, with **TDS loads exceeding 3036 tons per month** and effluent concentrations averaging **7456 mg/L**, well above the **5000 mg/L limit** specified in Appendix H. In a January 1, 2009 permit renewal, the Statement of Basis states as a matter of fact that "this facility is exempt from end-of-pipe effluent limits for chlorides, sulfates, specific conductance and total dissolved solids."

As discussed elsewhere in this letter, this unlawful exemption has caused and continues to cause significant impairment to Alkali and Badwater creeks, and poses an ongoing threat to water quality in Boysen Reservoir and in the Class 1 segment of the Wind River below the dam. Yet it continues, even though the practice is patently unlawful.

EPA has provided clear and unequivocal guidance regarding "grandfathering"; "grandfathering" discharges is impermissible under the CWA. Specifically, EPA has stated in its NPDES state program guidance that "[o]ther States have attempted to 'grandfather' or exempt discharges already in existence . . . [s]uch schemes are inconsistent with the CWA." Chapter Three: Statutory Authority and the Attorney General's Statement, National Pollutant Discharge Elimination System State Program Guidance for Development and Review of State Program Applications and Evaluation of State Legal Authorities (40 CFR Parts 122–125 and 403) Volume One (July 29, 1986) at 3-6–3-7. This guidance serves to advance the twin goals of the Clean Water Act: "to *restore* and to *maintain* the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. 1251(a). The DEQ's position that grandfathering is permissible is untenable in light of these goals. Indeed, if grandfathering "historic discharges" were lawful, major industrial pollutant discharges occurring in major industrial cities across America would still be dumping chemicals and raw sewage untreated into the nations surface waters.

Yet the modification to effluent limits was allowed to continue as the oil field expanded through multiple field ownerships, and through multiple renewals and modifications (both major and minor) of the discharge permit. In several 2010-era permit actions, it appeared that the DEQ was committed to reducing TDS loads from this field "to the pre-2009 grandfathered levels" which the DEQ stated was 908 tons per month. *See, e.g.,* Encana Oil and Gas Company, WY0002062, Statement of Basis for Minor Modification, dated 12/14/2010 (containing a compliance schedule to reduce TDS to 908 tons per month by January 1, 2013). But now, despite the opportunities presented by a change of ownership of the field along with a permit renewal, the DEQ is proposing to continue, rather than reduce, the monthly TDS load limit of 908 tons per month, and defer effluent limitations for chloride until 2024.

The DEQ cites Appendix H as justification to modify effluent limits for outfalls 001 to 012. Yet Appendix H applies only "where the original permit application was submitted prior to

September 5, 1978." Since the DEQ has not provided a copy of the "original permit application" the public is unable to verify that 12 outfalls were authorized in that original permit. This information should be disclosed to the public and included in the agency's response to public comment.

Assuming (for purposes of discussion only) that grandfathering in any form is lawful, the exception can only extend to the outfall(s) and to the discharge(s) that existed prior to September 5,1978. Were all 12 outfalls permitted and in operation prior to that date? If not, how does the DEQ justify grandfathering discharge permits that were issued after September 5, 1978?

The DEQ consolidated Encana WY0002062 (single outfall) with eleven other single-outfall permits in a permit "renewal" effective January 1, 2009. *See* Statement of Basis Renewal and Discharge Permit, Encana Oil and Gas Company, signed by the DEQ Director on 12/31/08. The eleven existing permits that were consolidated with WY0002062 included: WY0002089, WY0002101, WY0025526, WY0025534, WY0025542, WY0027227, WY0027235, WY0027243, WY0027251, and WY0027456. The SOB clearly states that: **"This permit originally established a chloride limit of 230 mg/L at the end of pipe for discharge into Class 3B waters."** (Emphasis added). If that is the case, what is the basis for grandfathering the much higher effluent limits?

1. **Outfalls 013, 014, and 015 were not grandfathered when approved and cannot be grandfathered now.**

As noted above, in December 2008, 12 outfalls were consolidated into a single permit, WY002062. In December 2010, the DEQ approved a minor modification to the permit that added two new outfalls, 013 and 014, and set effluent limits for those outfalls based on the limits contained in Appendix H. The Statement of Basis for the modification notes that: "Outfalls 013 and 014 include limits of 2000 mg/L of chloride and 3000 mg/L of sulfate, **a requirement of all non-grandfathered oil production unit WYPDES permits.**" (Emphasis added). The modification also added chloride and sulfate monitoring requirements for outfalls 001–012 for "data collection." This modification added a compliance schedule to ratchet down over a two-year period salt loads from 3036 tons per month to 908 tons per month.

Outfall 015 was added in a Permit Renewal effective 10/21/13, formerly WY0056791, outfall 001. The renewed permit retained Appendix H effluent limits on outfalls 013 and 014, and required the newly added outfall 015 to comply with Appendix H effluent limits for chloride (2000 mg/L); sulfate (3000 mg/L); and specific conductance (7500). In other words, grandfathering was not applied to outfall 015.

2. **Outfall 016 cannot be grandfathered.**

Outfall 016 was approved in a Major Modification to the permit in April 2015.[3] This modification also added the Neptune Treatment Facility, established an interim effluent limit for TDS of 1760 tons per month (nearly doubling the existing 908 tons per month limit) during a

[3] If Outfall 016 was added in April 2015, why does the DEQ's January 2020 revised draft permit propose to "Add outfall 016"?

four month start-up period, and included a compliance schedule that required the facility to limit TDS to no more than 908 tons per month for outfalls 001–016 effective September 1, 2015. The Statement of Basis for this modification indicates that "the new outfall location is at the stilling well at Pink Lake. Because the water source is largely from the grandfathered per Chapter 2 Appendix H sources, it is treated as such and there are no concentration limits for sulfate, chloride, specific conductance, or total dissolved solids." SOB at 1. Oddly, despite the preceding sentence, the modification retained Appendix H-based numeric effluent limits for outfalls 013–015, including effluent limits on chloride, sulfate, and specific conductance. As a newly approved outfall, outfall 016 should not have been grandfathered for the same reasons that 013, 014, and 015 were not grandfathered.

In sum, it is clear that outfalls 013, 014, 015, and 016 fail to meet the DEQ's own internal requirements for historical grandfathering (pre-September 5, 1978). These outfalls were not grandfathered when they came on-line, and there is no basis for grandfathering them now. This practice of retroactive grandfathering must end. Not only for outfalls 113–016, but also for 001–012.

C. The Draft Permit Violates the DEQ's Antidegradation Requirements.

The Statement of Basis (SOB at 8, 9) includes a discussion of the antidegradation review required by Chapter 1. Intended to achieve the Clean Water Act's goal of restoring and maintaining water quality, antidegradation is the third and arguably most important component of a water quality standard. Despite the DEQ's claim of regulatory compliance, our review shows that the draft permit violates Wyoming's antidegradation requirements for Alkali Creek (Class 3B) and Badwater Creek (Class 2AB). The DEQ's own analysis reveals existing and ongoing water quality impairment in both of these creeks attributable to WY0002062. Further, the SOB fails to contain any analysis to support the agency's antidegradation determination regarding Boysen Reservoir. The DEQ's improper and insupportable characterization of the existing discharge of oil and gas field wastewater as a "background condition within the watershed of the receiving water bodies…" has unfortunately resulted in the absence of a meaningful antidegradation analysis of the discharges from this facility at any time during its existence.

1. Regulatory requirements.

The DEQ's antidegradation requirements are set forth in Chapter 1, Section 8, and provide as follows:

> (a) Water uses in existence on or after November 28, 1975 and the level of water quality necessary to protect those uses shall be maintained and protected. Those surface waters not designated as Class 1, but whose quality is better than the standards contained in these regulations, shall be maintained at that higher quality. However, after full intergovernmental coordination and public participation, the department may issue a permit for or allow any project or development which would constitute a new source of pollution, or an

increased source of pollution, to these waters as long as the following conditions are met:

(i) The quality is not lowered below these standards;

(ii) All existing water uses are fully maintained and protected;

(iii) The highest statutory and regulatory requirements for all new and existing point sources and all cost effective and reasonable best management practices for nonpoint sources have been achieved; and

(iv) The lowered water quality is necessary to accommodate important economic or social development in the area in which the waters are located.

(b) The Water Quality Administrator (administrator) may require an applicant to submit additional information, including, but not limited to, an analysis of alternatives to any proposed discharge and relevant economic information before making a determination under this section.

(c) The procedures used to implement this section are described in the Antidegradation Implementation Policy.

2. Violations of regulatory requirements.

Alkali Creek (Class 3B). Alkali Creek is the first classified receiving water downstream of the outfall. As a Class 3B stream, it is entitled to the Tier 1 "basic" level of antidegradation protection. SOB at 8. *See* 40 CFR 131.12(a)(l). Under the Clean Water Act and its implementing regulations, Tier 1 protection requires the DEQ to protect existing uses—and the quality of water necessary to maintain those uses. Although the DEQ claims that "[t]he effluent limits for protection of this stream are set to equal the applicable class 3B standards" --implying that existing instream uses are protected-- that assertion is not correct.

Alkali Creek has been severely impaired by oil field wastewater, and the impairment has worsened over time as the Moneta Divide field has expanded to its current size of over 800 oil and gas wells. *See* Bureau of Land Management, Moneta Divide DEIS at 1-5. Decades of improperly controlled discharges have altered the physical, chemical and biological condition of this stream, and have caused ongoing violations of water quality standards. Although not disclosed in the revised draft permit, the DEQ's December 17, 2019, Letter of Violation to Aethon Energy Company describes the impaired conditions of this high desert stream. The ongoing modifications ("grandfathering") through multiple permit renewals of TDS and chloride concentration limits that exceed effluent limits contained in Appendix H are undoubtedly contributing factors, along with increasing volumes of produced water carrying heavier salt loads.

Alkali Creek is impaired by a variety of oil field pollutants including high levels of chloride that have harmed aquatic life and by high TDS concentrations that exceed limits regarded as being safe for use by livestock and wildlife. *See* DEQ Chapter 2, Appendix H(b)(vii). Professor Bergman's and Dr. Meyer's February, 18, 2020 Memorandum indicate that chloride and TDS concentrations authorized in the existing permit are harmful to aquatic life. Although protection of existing uses is a fundamental requirement of the Clean Water Act, it is clear that high chloride concentrations and other pollutants present in the effluent and in Alkali Creek are preventing the attainment of designated "aquatic life" uses in violation of Chapter 1. All evidence suggests that the DEQ is failing to meet the "basic" antidegradation requirements for Tier 1 waters.

Badwater Creek (Class 2AB). Badwater Creek is considered a "Tier 2" high quality surface water. SOB at 8, 40 CFR § 131.12(a)(2). For high quality waters, Chapter 1 provides that: "Those surface waters not designated as Class 1, but whose quality is better than the standards contained in these regulations, shall be maintained at that higher quality." As discussed below, the DEQ has failed not only to maintain the higher water quality required of Tier 2 streams, it has failed to maintain even the most basic Tier 1 level of protection. *See* Ch. 1, Section 8(a). In fact, the agency has failed to comply with every single requirement enumerated in Section 8 for Tier 2 waters:

- The quality of Badwater Creek has in fact been lowered below the applicable standards;

- Existing water uses of Badwater Creek have in fact not been fully maintained and protected;

- The highest statutory and regulatory requirements have in fact not been achieved (indeed, the SOB and draft permit proposed to "grandfather" a monthly load limit for TDS of 908 tons, and completely eliminates the effluent concentration limit for TDS contained in Appendix H); and

- The DEQ has in fact not made a determination that "lowered water quality is necessary to accommodate important economic or social development in the area in which the waters are located."

The DEQ's conclusion that since "there is no new or increased load with this renewal beyond those historic discharge levels, then this facility is not considered by WDEQ to be a source of significant degradation at this time" is insupportable. The DEQ has not provided any evidence of what the historic discharge levels were prior to 1975, and appears to be arguing that *any* discharge of *any* amount prior to 1975 provides a sufficient basis to grandfather current discharges, which could be and likely are vastly greater than the pre-1975 discharge.

The evidence shows that significant degradation—as defined in the DEQ's antidegradation policy—is already occurring; consequently, the DEQ cannot legally move forward with an action that would further degrade a "high quality" Tier 2 surface water, especially when it is not even meeting the basic Tier 1 level of protection.

Boysen Reservoir (Class 2AB). The Statement of Basis claims that "WDEQ has reviewed the expected mixed concentration of effluent within the Boysen Reservoir system, and has determined that the above condition is maintained. No pollutants from this facility are expected to result in mixed concentrations that consume 20% or more of the available assimilative capacity within the lake. Therefore, WDEQ's review has concluded that continued discharges from this facility will not result in significant degradation of Boysen Reservoir." SOB at 8. In order for the DEQ to reach this conclusion, it must know, *a priori,* the assimilative capacity within the lake, but this information in not provided. The burden is on DEQ to explain: 1) how it determined the assimilative capacity of the lake; 2) what the assimilative capacity is; and 3) how it determined that the discharge would consume less than 20% of the assimilative capacity. This information is required in order to ensure the DEQ considered all relevant factors and to verify that its calculations and methodology are sound. Without any discussion of how the DEQ reached its conclusions regarding impairment to Boysen Reservoir, the DEQ's antidegradation determination is deficient on its face and cannot be used to justify or support the agency's findings.

To the extent the DEQ is relying in any way on the Boysen Reservoir Modeling Study prepared by Aethon's contractor, Environmental Resources Management, we hereby adopt and incorporate by reference as if fully set forth below the Final Technical Memorandum, dated July 1, 2019, prepared by Hydros Consulting, submitted with our comments on the initial draft permit and now on file with the DEQ.

Wind River Below Boysen Dam (Class 1). As noted by DEQ, Wyoming Class 1 waters are "Outstanding waters . . . in which no further water quality degradation by point source discharges other than from dams will be allowed. The water quality and physical and biological integrity which existed on the water at the time of designation will be maintained and protected." Ch. 1, Section 4(a). Class 1 waters are subject to the highest level of antidegradation protection, "Tier 3." 40 CFR § 131.12(a)(3).

The DEQ has determined that because "the discharge itself represents a background concentration within the watershed of the receiving water bodies, including the Wind River Class 1 segment," compliance with applicable requirements has been achieved. SOB at 9. As noted above, we fundamentally disagree with the DEQ's characterization that a permitted discharge of pollutants should be treated as a "background concentration" rather than what it is, which is pollution contributing to impairment of water quality that has never been subject to a proper antidegradation review in accordance with the DEQ's rules and policies.

III. ADDITIONAL CONCERNS, QUESTIONS AND RECOMMENDATIONS

Evidence of historic amount of 908 tons per month of TDS must be provided. The draft permit claims that 908 tons per month is the "historic level" of salt discharge from the facility and bases all of its major decisions on that amount, but provides no historical evidence to support that claim.[4] Given that at least one previous permit contained a chloride limit of 230 mg/l, and

[4] For example, the DEQ justifies its conclusion that the discharge is not "a source of significant degradation" in Boysen Reservoir "[b]ecause this facility and its discharge predate the 1975 Clean Water Act …" SOB at 8.

presumably had smaller discharge volumes and loads, the DEQ must explain how it determined that 908 tons per month is the historic limit. What years/permits were considered in developing this "historic level"?

Assuming that any kind of grandfathering is legally permissible (we assert it is not), the discharge subject to grandfathering may only comprise that which existed prior to 1975, both in terms of the number and location of outfalls permitted, and the amounts and concentrations of pollutants being discharged. The DEQ has not provided any evidence, other than statements, about the specifics of the pre-1975 discharge. Again, assuming that grandfathering of any kind is lawful, the only discharge that could conceivably be grandfathered is the discharge that exited pre-1975. What evidence exists to show that the pre-1975 discharge contained 908 tons/month? This information needs to be provided to the public for review and confirmation.

Demonstration of agricultural and wildlife use of water required. The SOB at page 11 states that "[t]he Wyoming Game and Fish Department determined that discharge of produced water from all existing WYPDES-permitted oil production units in Wyoming enhances wildlife propagation and habitat." We request that you provide a copy of the WGFD "determination" in your response to public comments.

Antidegradation impairment review in the Statement of Basis is flawed.
The DEQ claims that:

> The discharge of wastewater and the effluent limits established in this permit ensure that the levels of water quality maintain and protect the designated uses of the receiving waters. An antidegradation review verifies that the permit conditions, including the effluent limitations established, provide a level of protection to the receiving water consistent with the antidegradation provisions of Wyoming surface water quality standards. In addition, an evaluation of the receiving waters revealed that they are not on the 303(d) list as waterbodies that cannot support designated uses.

SOB at 9.

The DEQ's LOV to Aethon reveals that the existing discharge has caused water quality impairment that has interfered with existing uses in the receiving waters. This paragraph must be revised to properly state the condition of Alkali and Badwater creeks. In addition, while it is true that these streams are not currently on the 303(d) list of impaired waterbodies, they should be. Thus, based on information contained in the DEQ's LOV and our own analysis, we will be submitting a request to DEQ to add Alkali and Badwater creeks to the draft 303(d) list.

Outfalls 013 and 014 are not "grandfathered" and therefore require numeric limits consistent with those set forth in Appendix H. A major permit modification signed by the DEQ Director on January 19, 2010, combined WY0002062 with WY0028771 resulting in the addition of two additional outfalls, 013 and 014, for a total of fourteen outfalls. According to the Statement of Basis for that major modification, "Outfalls 013 and 014 do not fall under the that rule provision [grandfathering] and have additional limits and monitoring requirements for

sulfates and chlorides." To avoid backsliding prohibited by the Clean Water Act, the current January 2020 permit renewal must acknowledge and include this requirement.

Outfall 015 is not "grandfathered" and must include effluent limits established in Appendix H. The renewal of WY0002062 on October 21, 2013, added outfall 015. The permit contained effluent limits consistent with requirements contained in Appendix H. *See* Part 1, A.1.b. (effluent limits for outfalls 013-015). For the same reason, those limits must be included in the January 2020 renewal.

Approval of 16 outfalls not justified. The revised draft permit proposes to authorize a discharge of pollutants from 16 outfalls, yet the existing discharge of approximately 2 million gallons per day –presumably from the four outfalls currently in operation—contributes a "historic level" of 908 tons per month of TDS. How can the DEQ justify a proposal to renew the permit for 16 outfalls when the existing discharge from four outfalls represents the permit "cap" on the salt load? What is the current existing discharge volume from the four functioning outfalls, and what volume is anticipated when the other outfalls come on line?

Reasonable Potential Analysis Required for Chloride in Alkali Creek. The DEQ "has determined that there is a reasonable potential for this facility to exceed the instream standard for chloride in Badwater Creek." *See* SOB at 3. To address this potential. the DEQ proposes "a final effluent limit of 230 mg/L for chloride, effective July 1, 2024." *Id.* We believe that the DEQ must establish a similar chloride standard to protect aquatic life in Alkali Creek. The fact that DEQ removed the chloride limit for Class 3 streams in an earlier rulemaking does not excuse the agency from complying with water quality standards for the protection of aquatic life.[5]

Even if –assuming for purposes of discussion- the removal of the 230 mg/L chloride instream limit was legal, the permit –at a bare minimum- must still protect designated uses. Protection of designated uses, and water quality necessary to protect those uses, is a fundamental requirement of the Clean Water Act. 40 C.F.R. §131.12(a)(1). It is clear from DEQ's own information that it has failed to protect designated uses in Alkali Creek by allowing the degradation of water quality resulting from excessive chloride and other pollutants. Accordingly, as explained above and supported by Dr. Meyer and Professor Bergman's analysis, a water quality based chloride limit must be established for this permit that is protective of aquatic life.

[5] The renewal of this permit on January 1, 2009 consolidated eleven discharge permits into a single new permit that authorized twelve outfalls, 001 to 012. The Anti-Backsliding Provision on page 2 of the Statement of Basis for the 2009 permit renewal explains that:

> This permit originally established a chloride limit of 230 mg/l at the end-of-pipe for discharge into Class 3B waters. Since the issuance of the original permit, chloride standards established in Chapter 1 of the Wyoming Water Quality Rules and Regulations have changed to excluding aquatic life standards for chloride in Class 3 waters. Therefore, WDEQ has removed the effluent limit and monitoring requirements for chloride in this permit. It is WDEQ's determination that removing chloride limit from this permit conforms to the anti-backsliding requirements established in Section 402(o)2.B.i. of the Clean Water Act.

See Chapter 2, Section 5(c)(iii)(C)(IV), page 2-40 ("Where the administrator determines that an effluent constituent has the reasonable potential to adversely affect a designated use of receiving waters of the state and no numeric standard has been promulgated … for the constituent, the administrator may establish a numeric effluent limitation based on values derived from appropriate scientific methods.").

Chloride is harmful to freshwater aquatic life. *See* Bergman/Meyer Memo. It is clear that the absence of a chloride limit in permit WY0002062 since 2009 has resulted in severe impact to native aquatic life in Alkali Creek. Yet the absence of a chloride limit in Chapter 1 for Class 3 streams does not –despite what it may believe-- relieve the DEQ from its responsibility to protect aquatic life in Alkali Creek.

Description of compliance schedule is incorrect. The description of the compliance schedule for chloride on page 2 of the Statement of Basis states that "[t]he previous permit versions for this facility did not include water quality based chloride effluent limits for protection of Badwater Creek as a class 2AB stream (cold water fishery)." That statement appears to be incorrect. As discussed above, the anti-backsliding provision on page 2 of the Statement of Basis for the 2009 permit renewal clearly states that "[t]his permit originally established a chloride limit of 230 mg/l at the end-of-pipe for discharge into Class 3B waters." We suggest a revision to this section to clarify that a 230 mg/L chloride limit was indeed included in previous permits.

Justification for compliance schedule is needed. The Compliance Schedule on page 3 of the Statement of Basis indicates that "full compliance" with a chloride limit of 230/mg/L will be required by July 1, 2024. The SOB states that "[t]he purpose of the four-year compliance schedule is to allow the permittee time to install additional treatment capacity and optimize its output, in order to meet the final effluent limit of 230 mg/L from the outfalls at this facility. The DEQ should explain why additional time is required, given that a treatment facility is located on site. Does this existing treatment facility not have the capacity to reduce salt loads required to achieve a 230 mg/L chloride limit? DEQ provides no compelling justification for this four-year compliance schedule.

Compliance issues should be explained. The existing permit underwent a MAJOR MODIFICATION in April of 2015 to address the start-up of the Neptune Treatment Facility. Yet the revised draft permit states that the Neptune Treatment Facility "has been inoperable since March of 2019, due to technical issues at the plant…" and that "the permittee has no specific plans to re-open the treatment plant at this time." SOB at 1.

The existing permit requires Aethon, to "properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit." *See* Authorization to Discharge Under the Wyoming Pollutant Discharge Elimination System, WY0002062, dated 4/27/15, Part II, A.3. Facilities Operation. In light of this system failure, the DEQ should explain both the reason(s) for the failure and how the existing 908-ton monthly load limit of TDS is being achieved in the absence of treatment.

Monitoring of pH on Badwater Creek Required. The only monitoring station proposed by DEQ will require on Badwater Creek is BWC1 "below its confluence with Alkali Creek". That station might totally miss the elevated pH that Bergman and Meyer predicted will occur as the oversaturated CO2 gas in the effluent degasses from Alkali and Badwater Creeks enroute to Badwater Bay in Boysen Reservoir. In addition to BWC1, at least one other monitoring station on Badwater Creek should be required immediately upstream of Badwater Bay (where the highest pH values in Badwater Creek might be expected).

Significant flaws exist in DEQ's approach to establish final effluent limit for sulfides. The DEQ determined that there is a reasonable potential for the facility to exceed the instream standard for hydrogen sulfide in Alkali Creek, and therefore included a final water quality based effluent limit of 20ug/L for Total Sulfide at each outfall "in order to meet the instream standard of 2 ug/L for Hydrogen Sulfide. SOB at 6. As discussed below, there are significant flaws to this approach.

Professor Bergman and Dr. Meyer note that the DEQ is requiring a total-sulfides analysis, which is only appropriate if the permit limit were set low enough to not allow high concentrations of H2S, i.e., above the aquatic life numeric criterion of 2 ug/L. However, the approach used by DEQ is not at all sufficient to achieve compliance with instream standards. The DEQ looked at the historical pH data for the effluent (data not provided) and determined that the median pH was 7.9. At that pH, only approximately 10% of the total sulfide (H2S + HS- + S2-) is H2S. Thus, the DEQ reasoned that if "the instream standard for Hydrogen Sulfide is 2 µg/L, a Total Sulfide level of 20 µg/L or less at the outfalls would be required to achieve an output level 2 µg/L or less for Hydrogen Sulfide." SOB at 6. The obvious flaw in this approach is the fact that 50% of the historical pH values were, by definition of the word "median", less than pH 7.9 -- meaning that the H2S concentration exceeded 10% of the total sulfide concentration more than 50% of the time. Therefore, in order to achieve the aquatic life numeric criterion of 2 ug/L, the DEQ should select a a lower pH percentile than the median (which is the 50th percentile), perhaps something like the 10th percentile, meaning expected errors would be belowc10% of the time.

Unfortunately, because DEQ did not provide the pH data, it is impossible to know what the 10th percentile of those historical pH values is. The following example shows how important this could be in terms of meeting in-stream numeric criterion for H2S. *At a pH of 7.0 (see the speciation diagram at the top of page 6) H2S is approximately 50% of the total sulfide concentration.* Thus, at a pH of 7.0, the total sulfides effluent limit concentration should not exceed 4 mg/L (instead of the 20 mg/L at pH 7.9) in order to not exceed an H2S concentration of 2 mg/L. Therefore, in order to set an effluent limit that is protective of the aquatic criterion, it important to know the entire distribution of historical pH values, not only the median pH. The simplest and most efficient approach would be for DEQ require that the H2S concentration be calculated from the measured pH and measured total sulfide concentration in each effluent, using the well-known pKa (acid dissociation constant) of H2S -- thus avoiding any intermediate assumptions and receiving the concentration of actual interest.

More information needed to support agency's Reasonable Potential analysis for manganese, fluoride, uranium, and E.coli. The DEQ states that "[e]ffluent limits for Manganese,

Fluoride, Uranium and E. coli were not included in the permit because based on *available data*, the facility has no reasonable potential to exceed the calculated effluent limits for those pollutants." SOB at 7 (emphasis added). The DEQ should provide the historical data for concluding there is no reasonable potential for exceedances of the standards (or limits) for F, Mn, U, and E. coli.

The permit must include both chronic and acute WET testing. Without providing any explanation for the change, the DEQ proposes to eliminate chronic whole effluent toxicity (WET) testing from the permit. SOB at 10. Under the revised draft permit, only acute toxicity testing would be required. Both Acute *and* Chronic WET testing were included in the initial draft permit, and the reasoning for including both chronic and acute WET testing was sound. March 13, 2019, SOB at 11, 12. The proposal to remove chronic WET testing requires an explanation.

Alkali Creek is Class 3B, and "Uses protected for Class 3B streams such as this include aquatic life, …" (page 8). Bergman and Meyer have concluded that passing only acute toxicity tests with Daphnia magna and fathead minnows (Pimephales promelas) will not ensure protection of at least 95% of the aquatic life, especially sensitive invertebrates. Effluents from this facility could easily pass acute toxicity tests and fail at least the D. magna (and possibly also the fathead minnow) chronic toxicity tests. For these reasons, the DEQ must restore chronic WET testing in the permit.

The DEQ's failure to analyze and disclose critical water quality sampling data precludes permit renewal. The DEQ/WQD administrator is required to ensure that an application for a WYPDES permit is complete and that the general and specific information requirements outlined in Chapter 2 are satisfied. *See* Chapter 2, Section 5(a). As part of the processing of a permit application, the administrator is required to make several determinations including that the proposed effluent limits will ensure that water quality standards will not be violated. Chapter 2, Section 5(b)(i). The failure of the DEQ to consider critical water quality data *in its possession* in the context of this proposed renewal undermines the integrity of the process and interferes with the agency's ability to ensure that proper monitoring and effluent limits are included in the revised permit. Chapter 2, Section 5(b)(iii).

Our groups recently requested all documents held by the DEQ related to this permitting process. While the agency produced a variety of documents, some lab reports and water quality analyses were withheld from production because these results had not yet been finalized by the agency. It is troubling that these documents were not finalized and ready for public inspection before the close of this comment period. As a result, our organizations were unable to consider these documents to inform our understanding of the severity of the water quality issues and the relationship between current water quality violations and this permitting process. What's more troubling is that the agency failed to finalize these reports prior to *its* analysis of the permit. The DEQ should not issue this permit until the water quality results are finalized, and should re-notice the permit for public comment when the results are available.

Pollutants detected in Alkali Creek are harmful to wildlife and impede attainment of designated uses. The December 2019 letter of violation issued to Aethon Energy documents the presence of pollutants that are harmful to birds and other species. *See* Ramirez, Pedro, Oil Field

Produced Water Discharges into Wetlands in Wyoming, U.S. Fish and Wildlife Service, Contaminant Report R6/718C/02, attached in Appendix A. Alkali Creek is a Class 3B stream, and its designated uses include use by wildlife. *See* DEQ/WQD Chapter 1, Section 3(h) (Wildlife use includes protection of water quality to a level which is safe for contact and consumption by avian and terrestrial wildlife species.") As discussed above, the DEQ must ensure that the discharge of produced water does not violate water quality standards. *See, e.g.*, Chapter 2, Section 10(c); Appendix H(c)(iii). Here, the DEQ has failed to ensure that the discharge is consistent with water quality standards, and therefore may not lawfully renew WY0002062.

Response to Public Comments. This letter, and the attached Memorandum from Dr. Harold Bergman and Dr. Joseph Meyer, contain a number of specific comments and recommendations. In accordance with the DEQ's rules governing public participation in the reissuance of draft permits, in the event a comment or recommendation is overruled, we would appreciate a statement of reasons explaining "why any comments did not result in a change to the draft permit." DEQ/WQD Rules and Regulations, Chapter 2, Section 15. Public Participation, (g)(iii).

IV. CONCLUSION

Although substantially improved over the earlier version, the revised draft permit still allows unlawful, unacceptable and environmentally damaging amounts of salts and other pollutants to enter Boysen Reservoir and its tributaries. The existing discharge of wastewater from the Moneta Divide oil and gas field has violated state water quality standards, causing significant damage to Alkali and Badwater creeks. We urge DEQ to require Aethon to take immediate action to repair the damage caused by years of neglect and restore the natural ecological function of surface waters impacted by this development.

We would appreciate being notified directly at the addresses shown below of any additional public comment and/or objection opportunities related to WYPDES Permit No. WY0002062. In addition, we request advance written notice of any public comment and/or objection opportunities provided in connection with any use attainability analyses (UAA) and/or proposed changes to water quality standards, including designated uses and numeric and/or narrative criteria, for Alkali and Badwater creeks.

Sincerely,

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Kevin Frederick, WQD Administrator
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Assistant Regional Administrator
Office of Water Protection

Enclosures:

Aethon DMR Violations
DEQ water quality sampling data
Bergman/Meyer Memorandum, dated February 18, 2020.
Letter of Violation re: WYPDES No. 0002062
Aethon Energy Company's Response to LOV
WOC/PRBRC Complaint and Request for Investigation
DEQ Response to Complaint and Request for Investigation
U.S. Fish and Wildlife Service, Contaminant Report R6/718C/02

APPENDIX A – Exhibits

Aethon DMR violations

Letter of Violation issued to Aethon Energy Company

Aethon's Response to Letter of Violation

DEQ water quality sampling data

WOC/PRBRC Complaint and Request for Investigation

DEQ's Response to Complaint and Request for Investigation

Bergman/Meyer Memorandum, dated February 18, 2020

U.S. Fish and Wildlife Service, Contaminant Report R6/718C/02