

# RESPONSIVENESS SUMMARY FOR COLSTRIP UNITS 1&2 REMEDY EVALUATION REPORT – PART ONE

## 1.0 INTRODUCTION

The Department of Environmental Quality (DEQ) solicited public comment on the Units 1&2 Revised Remedy Evaluation Report, Part I for the Colstrip Steam Electric Station (SES) during a public comment period that ran from November 14, 2019 to December 16, 2019. DEQ received written comments on the proposed remedies presented in the Report from 411 entities during the public comment period.

Please note that the report for the Units 1&2 area is split into two parts. The first part of the report addresses existing groundwater contamination through a capture and clean water injection system. The second part of the report will address source control at the closed and unlined Stage I Pond and the lined Stage II Ponds and is scheduled to be submitted in Summer 2020.

## 1.1 COMMUNITY INVOLVEMENT BACKGROUND

Cleanup of the Colstrip SES is regulated by the DEQ through an Administrative Order on Consent (AOC). Under the AOC, public participation is required via a 30-day comment period.

## 1.2 NOTIFICATION OF PUBLIC COMMENT PERIOD

Printed notices for the 30-day comment period were published in the Billings Gazette, the Miles City Star, and the Independent Press, as required by the AOC.

## 1.3 EXPLANATION OF RESPONSIVENESS SUMMARY

All comments received during the public comment period on the Remedy Evaluation Report have been reviewed and considered by DEQ in the decision-making process and are addressed in this Responsiveness Summary. Due to the volume of comments and given that many of them are similar in nature and subject, DEQ has summarized the comments below. However, while the comments are summarized here for brevity, DEQ considered each comment submitted in its entirety. All original comments have been compiled and scanned and are available on DEQ's Colstrip website. This Responsiveness Summary will also be posted to the website. To assist in developing responses, DEQ added its own number to comments to add clarity; similar comments may be referenced to previous response(s).

## 1.4 ACRONYM LIST

For ease of understanding, DEQ is providing a list of acronyms used in the responsiveness summary:

AOC – Administrative Order on Consent  
BNRC – Board of Natural Resources & Conservation  
COC – Contaminant of Concern

COI – Constituent of Interest  
CCR – Coal Combustion Residual  
CCRA – Cleanup Criteria and Risk Assessment Report  
DEQ – Montana Department of Environmental Quality  
DNRC – Department of Natural Resources and Conservation  
HELP – Hydrologic Evaluation of Landfill Performance (model)  
MEIC – Montana Environmental Information Center  
MNA – Monitored Natural Attenuation  
MFSA – Major Facilities Siting Act  
MPDES – Montana Pollutant Discharge Elimination System (permit)  
MWQA - Montana Water Quality Act  
NPRC – Northern Plains Resource Council  
PCC – Potential Cleanup Criteria  
ppm – Parts per million  
PRB – Permeable Reactive Barrier  
RER – Remedy Evaluation Report  
SOEP—Stage One Evaporation Ponds  
STEP—Stage Two Evaporation Ponds

## Northern Plains Resource Council

### Cover Letter Comments

- 1) *Northern Plains Resource Council (NPRC) incorporates KirK Engineering & Natural Resources, Inc. comments by reference.*

Response: Please see DEQ's responses to KirK Engineering's comments.

- 2) *While we appreciate that perpetual pumping may now be a necessary element of pollution control, it is not enough in-and-of-itself. The source of pollution must be eliminated.*

Response: DEQ agrees and is requiring Talen to include an alternative that evaluates excavation for both the STEP and the SOEP ponds in Part 2 of the report. DEQ is providing conditional approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. The conditional approval includes:

- Dewatering of STEP A and E cells;
- Increasing pumping rates at 8 existing capture wells;
- Installation of 31 new clean water injection wells north of SOEP and east of STEP;
- A pilot test demonstrating the operation of the new injection wells;
- Installation of 8 new vertical capture wells north of SOEP
- A permeable reactive barrier (PRB) feasibility study
- Continuation of the monitored natural attenuation (MNA) demonstration study;
- Decommissioning of the Units 1&2 Scrubber Pipeline/North 1AD Drain Pond;
- STEP B Cell post closure storm water management.
- Operation and maintenance of the capture/injection system

Please refer to the Fact Sheet for more information on the partial approval.

- 3) *The owners have been allowed to operate for four decades in direct violation of Montana water quality law and the plant's original Major Facility Siting Act permit.*

Response:In the decades preceding issuance of the AOC, DEQ worked with PPL Montana, Talen's predecessor, to achieve compliance with the Certificate. PPL Montana was proactive in installing capture wells to address the plume of groundwater contamination. From 2000 to 2011, PPL Montana invested \$4.2 million on groundwater mitigation in the 1 & 2 STEP pond area and \$4.7 million on groundwater mitigation in the 3 & 4 EHP area. PPL Montana built and operates a \$5.6 million waste water treatment plant for the 1 & 2 STEP and an \$4.4 million waste water treatment plant for the 3 & 4 EHP. These mitigation systems capture and treat groundwater for reuse in plant operations. At the time the AOC was issued in August of 2012,

PPL Montana had spent \$23.8 million dollars since 2000 to reline ponds and otherwise address seepage from the ponds. While many of the systems and actions taken by PPL Montana were effective, groundwater contamination continued to expand beyond the recovery systems in certain areas. Thus, DEQ decided to take formal enforcement action under the Montana Water Quality Act and the Major Facility Siting Act by entering into the AOC with PPL Montana.

- 4) *The problem must be addressed head-on with aggressive source-control measures that dig out coal ash sitting in the groundwater and move the coal ash to a lined landfill above the water table. To protect groundwater DEQ cannot leave unlined or leaking coal ash ponds sitting in the water table.*

Response: DEQ agrees and is requiring Talen to include an alternative that evaluates excavation for both the STEP and the SOEP ponds in Part 2 of the report. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please also see the response to Comment #2, and the attached Fact Sheet for more information on the partial approval.

- 5) *We believe DEQ will need to exercise the agency's authority as outlined in Article XIII, Section D, of the AOC ("In the event that the parties are unable to resolve a dispute within this period, the Department's Director shall issue a final decision") throughout the RER approval process.*

Response: Article XIII of the AOC provides a dispute resolution process in the event that a dispute arises between Talen and the DEQ staff administering the AOC. Should this occur, Talen's environmental management representative and DEQ's staff will first confer in an attempt to resolve the dispute informally. If that is unsuccessful, the dispute is elevated to the level of Talen's representative that is senior to its environmental management representative and DEQ's division administrator. In the event that Talen's representative and DEQ's administrator are unable to resolve the dispute, DEQ's Director is to issue a final decision. This dispute resolution process will be followed in the event a dispute arises between DEQ and Talen regarding DEQ's implementation of the AOC.

- 6) *The capture system daily contaminates even more groundwater, as virgin groundwater is pumped out from the ground via capture wells and piped into storage ponds where it mixes with coal ash. The ash ponds leak 367 gpm, while an estimated 750 gpm are pumped out of the aquifer. This needlessly contaminates 483 gpm of fresh groundwater just to control the spread of pollution.*

Response: Virgin groundwater is not being pumped from the ground via capture wells to control the spread of contaminated groundwater. Rather, the wells capture groundwater that has been contaminated and return it to the storage ponds. Although more water is pumped out of the aquifer than input from pond seepage, the high concentrations in seepage water has caused formerly clean groundwater to exceed cleanup levels, requiring a higher volume of groundwater to be captured to control the spread of the plume.

- 7) *It is encouraging to see the active remediation proposals in the RER, including critical in-situ flushing, but the Preferred Alternative does not include the single most important strategy needed to remediate pollution at the Units 1&2 ponds—source removal of the ash [at the STEP].*

Response: DEQ agrees that the STEP, in addition to the SOEP, needs to be evaluated for excavation. DEQ is requiring this to be included in Part 2 of the Report. Part 1 of the Report was not intended to address source control; rather, it was designed to address the capture/injection system that will be required to address the existing groundwater contamination, regardless of whether the ponds are excavated. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to Comment #2 and the Fact Sheet for more information on the partial approval.

- 8) *DEQ is not limited to approving only alternatives provided by Talen Energy.*

Response: Under the AOC, DEQ has the authority to select a “modified remedy.” As the AOC is being implemented, DEQ is directing Talen as to which alternatives should be evaluated in regard to source control methods in Part 2 of the Report. (Also see Comment #2).

- 9) *Capping any of these ponds in place will leave coal ash in contact with groundwater long-term, making it impossible to meet AOC cleanup goals in the future.*

Response: DEQ agrees; per DEQ’s letter to Talen dated April 22, 2019, DEQ will not approve a remedy that leaves a source in contact with groundwater long-term. DEQ is requiring Talen to include an alternative that evaluates excavation for all ponds (STEP and SOEP) in the Units 1&2 area in Part 2 of the Report.

- 10) *The alternatives presented by Talen Energy in this report do not allow DEQ to truly evaluate how STEP ash acts as a long-term source of COIs if it is capped in place. An alternative where both STEP and SOEP ash are removed needs to be evaluated in the Units 1&2 RER Part 2 and weighed against capping any of the ash in place.*

Response: DEQ agrees and is requiring Talen to include an alternative that evaluates excavation for both the STEP and the SOEP ponds in Part 2 of the report.

- 11) *The AOC includes a clear requirement in Article XI that the RERs must contain, among other things, an “Identification and summary of feasible remedial alternatives”. Source removal of coal ash is a standard practice for coal ash ponds that sit below the water table. In fact, state legislatures in North Carolina, South Carolina, Virginia and Illinois have all passed laws mandating this as a requirement. Talen Energy’s failure to identify source removal of STEP ash as a feasible remedial alternative in this report means they are not meeting this important standard in the AOC.*

Response: The Montana Legislature has not enacted legislation requiring the source removal of coal ash. However, DEQ agrees that source removal is a reasonable alternative that must be evaluated. DEQ is requiring Talen to include an alternative that evaluates excavation for both the STEP and SOEP ponds in Part 2 of the report. DEQ believes it has the authority to select a source removal alternative if it is needed to meet the cleanup criteria in the long term.

12) *None of the alternatives presented in the report achieve the cleanup criteria, as identified in the Units 1&2 Cleanup Criteria and Risk Assessment Report, within all AOC boundaries at the units 1&2 site.*

Response: DEQ recognizes that the cleanup criteria are not met when source control measures are not taken for the ponds at the SOEP and STEP. DEQ is requiring Talen to evaluate an excavation alternative for all of the ponds in Part 2 of the report, and is hopeful that ensuring adequate source control for the ponds, in combination with the capture/injection technology, will lead to the cleanup criteria being met in all areas. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to Comment #2 and the Fact Sheet for more information on the partial approval.

13) *We are steadfast in our belief that DEQ must use any means necessary to require Talen Energy to include a source removal alternative in Part 2 of the report. The AOC process is itself an enforcement action and the RERs are the single largest and most important decision-making part of that process. It is therefore critical that DEQ view enforcement as a central theme of the RER approval process and ensure that a source removal alternative is included for evaluation in Part 2.*

Response: DEQ agrees that a thorough source removal alternative for all ponds in the 1&2 area (Stage I and Stage II) is necessary in the evaluation; DEQ has requested that Talen include this in Part 2 of the Report. DEQ also agrees that the AOC is an enforcement action and that the remedy alternative selected by DEQ must bring the operation at Colstrip in compliance with Montana's Water Quality Act and Major Facility Siting Act for the long-term.

14) *Pond liners will not act as a permanent barrier between groundwater and coal ash. The water table at the Units 1&2 ponds is elevated above the bottom of the STEP ponds. Therefore, coal ash capped in place ensures coal ash will remain in contact with groundwater and be a long-term source of COIs. Even if the ponds are completely dewatered and all STEP coal ash is temporarily dried out, that situation won't last. Clean groundwater will well up through pathways in the liners where pond water is currently leaking. That groundwater will mix with coal ash again, become contaminated, and finally leak back out, carrying COIs into the aquifer. Talen Energy estimates the HDPE liners are rated for 400 years in unexposed conditions and 36 years in exposed conditions. No matter how long it takes, when the liners eventually fail, there will be a large mass of coal ash freshly exposed to groundwater.*

Response: DEQ has commented that as long as the liners remain in contact with groundwater, some water will still be able to seep into the impoundments, even if the ponds are dewatered. Because of this, DEQ is requiring that the STEP be evaluated for excavation, and that additional detail on the water table below the STEP (taking into account the various source control alternatives that will be proposed in Part 2) be provided.

15) *Horizontal flows into the STEP ponds is underestimated in the RER and this prevents DEQ from evaluating the negative impacts of leaving coal ash in place.*

Response: DEQ has a similar comment on the report that is being provided to Talen in DEQ's comment letter. DEQ is also requiring Talen to evaluate removal of the STEP ponds in Part 2 of the report.

16) *Long-term leaching of COIs from STEP ash is not accurately characterized. Talen Energy argues that the major source of COIs that contribute to future plume reemergence are from SOEP coal ash, and therefore that aggressive source controls are not needed at STEP. Leaving SOEP coal ash in place in Talen Energy's models in the RER is a clear attempt to downplay the negative impacts that capping STEP coal ash in place has on long-term cleanup goals.*

Response: DEQ agrees that the effectiveness of the in-situ clean water injection and capture system would be better represented if SOEP source control were included in the model. However, DEQ believes that flushing and capture will be necessary regardless of the type of source control selected for the ponds, and the model demonstrates that the capture/injection system will have a positive impact on the existing groundwater contamination despite the continued input of contaminants from the SOEP. Therefore, DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to Comment #2 and the Fact Sheet for more information on the partial approval.

DEQ is requiring Talen to evaluate removal of the STEP ponds to better characterize the individual sources at the 1&2 area; this evaluation will be included in Part 2 of the Report.

17) *NPRC supports DEQ approving the dewatering of all STEP ponds as a needed first step toward excavation. Along with Cells A and E, dewatering of the Old Clearwell should be included and approved in Part 1 of the report because that cell is currently being filled with coal ash. However, there should be clear language in the approved RER stating that this approval does not constitute a long-term source control plan for the STEP ponds.*

Response: DEQ agrees that dewatering the STEP ponds are a necessary step, and DEQ has commented that the Old Clearwell should be included in the dewatering proposal. DEQ also agrees that additional source control will be necessary to stop long-term sources of contamination, and is requiring Talen to evaluate excavation scenarios for both the SOEP and STEP. DEQ is providing partial approval of the Part 1 report, authorizing only those components

that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to Comment #2 and the Fact Sheet for more information on the partial approval.

18) *In reviewing groundwater models in the RER it is clear there will be a need for permanent pumping to control the boron plume from rebounding and spreading beyond AOC boundaries after the capture system shuts down. The RER should include financial assurance to cover the costs of long-term, likely perpetual, pumping at the Units 1&2 ponds site in order to control the spread of contaminants that in-situ flushing does not remove, including, for instance, through the endowment of a trust fund.*

Response: DEQ is requiring that Talen evaluate an excavation alternative for all of the ponds in the Units 1&2 area. Regardless of the source control method selected in Part 2, if the models demonstrate that pumping may be needed for a longer period than initially thought, DEQ will require additional financial assurance to continue operating the capture wells. DEQ is also requiring Talen to evaluate Monitored Natural Attenuation (MNA) and installation of a Permeable Reactive Barrier (PRB) if the model indicates the cleanup criteria will not be met at the end of the 30-year pumping period.

19) *Talen Energy states several times in the RER that "...it should be noted that monitoring in perpetuity is not required for waste disposal sites." We ask DEQ for a written response to this claim and to assess its validity. If Talen Energy is not required to monitor the Units 1&2 site in perpetuity and DEQ approves a plan that does not attain cleanup criteria in the AOC boundary, we believe DEQ has formally enabled a violation of Montana water quality law in perpetuity.*

Response: Whether or not monitoring in perpetuity will be required depends on the remedial alternative that DEQ selects and the need for perpetual monitoring under that alternative. The remedy that DEQ selects will achieve permanent attainment of the cleanup criteria at the point of compliance.

20) *New remediation technologies may be available in the future that can remove the less mobile constituents from the plume and prevent the need for perpetual pumping, but DEQ must not approve a plan that is based on that assumption.*

Response: DEQ agrees; if new technologies become available, DEQ will require an evaluation to determine if the technologies may aid in the removal of less mobile constituents. However, DEQ is not approving a remedy based on that assumption. DEQ will require Talen to implement the remedy that is shown to be most effective in remediation existing groundwater contamination, and preventing future contamination or plume re-emergence.

21) *There is no proof that removing those contaminants to background concentrations will ever be possible, and while DEQ must require a plan to maximize water quality, minimize degradation, and meet pollution criteria, DEQ must also prepare for the reality of ongoing water pollution by collecting a bond that will cover the cost of long-term pumping at the site.*



Response: DEQ requires Talen to build and update a groundwater model, which provides a simulation of plume presence and potential migration pathways. While the model is not intended to be used for specific predictive purposes, the model is an effective tool that can be used to compare different remedial alternatives, and can provide a general idea of whether cleanup criteria can be met. DEQ believes that implementing aggressive source control measures, combined with the capture/injection system, will succeed in maximizing groundwater quality and minimizing degradation. If the model indicates the measures required by DEQ will not achieve cleanup criteria in all areas, DEQ may require capture to continue. Also see the response to Comment #18.

22) *If prepared properly, the MNA study that Talen Energy is completing in the coming year will be helpful in evaluating if MNA is appropriate for the Units 1&2 sites, but with the data that is available today, DEQ must have a plan in place to control the pollution long-term.*

Response: DEQ is requiring Talen to evaluate aggressive source control measures, including removal of all ponds (SOEP and STEP) at the Units 1&2 Area. DEQ believes that eliminating the source is a crucial step in controlling the pollution long-term. If the updated model indicates existing contamination will not meet cleanup criteria at the end of the proposed pumping period, DEQ may require additional measures, such as long-term pumping. Talen also plans to perform an extensive MNA study that will verify the use of MNA for long-term plume control/elimination.

23) *High sulfate levels in the coal ash ponds must be controlled to safeguard water quality for downstream livestock producers. Average sulfate concentrations in the STEP ponds range from 20,000 – 50,000 ppm, with a maximum value of 155,000 ppm according to the CCRA. Concentrations of sulfates over 3,000 ppm negatively impact conception rates, result in decreased weight gain and polioencephalomalacia or “brain softening,” and lead to death in cattle.*

Response: DEQ agrees that high sulfate levels must be prevented from entering the aquifer, and existing high levels from historic seepage must be mitigated. Cleanup criteria for sulfate, as designated in the Cleanup Criteria and Risk Assessment Report, is either the background concentration for the individual aquifer, or a risk-based level of 3,000 ppm. This risk-based level was based on consumption by calves and accounts for health-related issues that may occur from ingesting high levels of sulfate.

24) *There is anecdotal evidence from landowners downstream from the Units 1&2 ponds on Armells Creek that water quality has been in a steady state of decline for 40 years. Ranchers have leveled fields in preparation for flood irrigation but then abandoned using that irrigation strategy on those fields because of poor water quality in Armells Creek and its negative impacts on soil health and crop production, notably from high sulfates. Landowners have also observed steep declines in aquatic life (large fish, turtles, frogs, and other life forms) during the last 40 years in Armells Creek. It is extremely difficult to prove that declines in both water quality and aquatic life in the water shed are a direct results of Colstrip’s coal ash ponds leaking, but we note both of*

*these observations to make DEQ aware of on-the-ground, long-term observations from residents in the area.*

Response: Thank you for your comment. DEQ is aware that high sulfate levels negatively impact the health of cattle; the cleanup levels for sulfate are based on background concentrations and risk to calves, and are designed to be protective for livestock consumption. The risk assessment did not identify adverse effects to Armells Creek as a result of pond leakage; however, DEQ is aware that the water quality in the creek can be highly variable due to a variety of impacts and low flow conditions in certain reaches of the creek. Talen continues to monitor Armells Creek on an annual basis to document any impacts or changes in creek water quality.

*25) While sulfates, like boron, is used as an indicator pollutant in Talen Energy's submission, the list of contaminants ultimately contained in coal ash – lithium, manganese, cobalt, selenium, radium, and more – is long and many of these contaminants pose meaningful threats to water and its uses in southeastern Montana.*

Response: Sulfate and boron were used as indicator parameters because the extent (volume and concentration) of sulfate and boron is the greatest among the list of parameters designated in the Cleanup Criteria & Risk Assessment Report and in the AOC. DEQ feels that using parameters with the largest volume and highest concentrations of contamination (relative to cleanup levels) is a conservative measure that best represents the nature and extent of contamination at the site, and demonstrates where other contaminants could migrate if no further action were taken. This information allows DEQ to better target remedial efforts in areas that are or could be impacted by pond contaminants to prevent risks posed by the full list of COCs.

*26) The RER does not meet key standards contained in the 2015 CCR Rule, and DEQ must consider this to ensure the AOC remedy is executed and that water and its uses are protected. Specifically, the CCR Rule requires that free liquids be fully drained from ponds prior to capping and that the base of existing CCR impoundments be 5 feet above the upper limit of the uppermost aquifer. Groundwater elevation at the Units 1&2 site are above the bottom of the STEP ponds. DEQ approval of a cap-in-place remedy means the agency policy is out of line with both of these key federal standards.*

Response: The AOC is an action taken by DEQ in 2012 to enforce the provisions of Montana's Water Quality Act and Major Facility Siting Act. Thus, the remedial actions ultimately selected by DEQ must bring operation of the Colstrip Power Plant into compliance with these state laws. The AOC is not an enforcement mechanism in regard to the 2015 CCR rules and DEQ has no authority to require Talen Montana to comply with the federal 2015 CCR rules. However, Talen Montana has agreed that any remedial alternative selected under the AOC should also comply with the 2015 CCR rules.

*27) When the ponds were proposed and under construction, landowners raised concerns that the reservoir(s) would not hold water and that storing wet coal ash in a scoria hillside would create*

*an enormous and expensive pollution problem. The Colstrip owners dismissed these concerns with testimony from licensed hydrologists, geologists, and engineers who argued that the ponds would be sealed, and leakages minimized. State agencies assured our members and others that if the ponds, did leak, extreme measures would be taken to correct the problem. Today, the aquifer continues to receive 500,000 gallons of contaminated water each day from the Colstrip coal ash ponds. The RER is the latest proposal from the company to address the problem and, in our opinion, does not qualify as an "extreme" approach by any means. Indeed, it fails to meet basic protective standards or comply with the AOC.*

Response: The initial Certificate of Compliance for the Colstrip Power Plant authorized the slurry of coal ash to the coal ash disposal ponds. Conclusion of Law 12(d) of the Board of Natural Resources and Conservation's "Findings of Fact, Opinion, Decision, Order and Recommendations" provides that the ash ponds were "to be completely sealed." It further provides that if the conventional means of sealing the ponds (compaction and bentonite application) did not seal the ponds, then "extreme measures" up to the complete sealing of the ponds with a plastic membrane would have to be taken.

Despite the completely sealed language, some seepage from the ponds was expected at the time the Certificate was issued. For example, Finding of Fact 61 indicates that seepage from the coal ash disposal ponds would be minimal and would be collected by wells and returned to the ponds. Finding of Fact 64 provides that the effluents emanating from Colstrip Units 1-4 were not anticipated to impair the quality of the ground and surface water in the area and would not violate applicable standards. Careful monitoring of seepage and complete sealing of sludge ponds would ensure the water quality of the area is not degraded. Finding of Fact 71 provides that monitoring wells would be constructed around the sludge ponds to ensure that any seepage from the ponds did not exceed the estimated minimum amounts around the rim and through the foundation of the dam.

Finding of Fact XXXIX of the Board of Natural Resources and Conservation and Board of Health and Environmental Sciences' "Findings of Fact and Conclusions of Law" provides that the various ponds which would be used for storage of water in the evaporation and disposal of water and waste materials emanating from Colstrip Units 1-4 would have seepage not anticipated to impair the quality of the ground water in the area.

A 1984 Stipulation to the Certificate was signed by the Board of Natural Resources and Conservation, the Department of Natural Resources and Conservation, the Department of Human Health and Human and Environmental Services, Northern Plains Resource Council, Rosebud Protective Association, Genie Land Company, Genie May Garfield, the Montana Power Company and the Board of County Commissioners-Rosebud County. The 12(d) Stipulation does not require the sealing of the ponds. Rather, the 12(d) Stipulation required the installation of monitoring wells in the Cow Creek and South Cow Creek drainages. If the monitoring indicated that the ground water was being impacted, interception of the ground water was required. The 12(d) Stipulation provides that compliance with the stipulation constitutes compliance with Condition 12(d) of the Certificate.

Conclusion of Law 12(d) was subsequently interpreted by the Montana First Judicial Court as follows:

The clear meaning of condition 12(d), taken in the context of the Board's findings that some seepage was expected (see BNR findings 61, 64, 68, 71, and 89 and BHES finding XXXIX), is that the pond as constructed for Relators may leak in small amounts but if the leakage is detected by the monitoring wells, the Relators will have to resort to more stringent measures, up to and including the installation of a plastic liner.

Talen and/or its predecessor has monitored the area around the ponds and implemented the "extreme measures" required under the Certificate --- the installation of synthetic liners. However, the volume of seepage from the ponds has been significantly greater, resulting in the contamination of groundwater.

## Kirk Engineering Comments

28) *Talen proposes a “wait and see” approach to leaving CCR in place at the STEP where a single-layer HDPE plastic liner separates the ash from groundwater. Talen provides credible evidence in the RER that the liners will eventually fail. Talen is also explicitly stating they won’t be undertaking the “see” part of wait and see because they don’t believe perpetual monitoring should be required. Any remedy that will fail at some point in the future with no plan for monitoring and contingency kicks the can down the road so that the public would have to assume responsibility for the contamination when liner failure eventually occurs. The Montana Water Quality Act does not allow a groundwater remedy which is temporary and guaranteed to be insufficient long-term. Talen either needs to plan for perpetual maintenance of CCR left below the groundwater elevation or needs to provide a remedy which separates CCR from groundwater.*

Response: The remedy that DEQ selects will achieve permanent attainment of the cleanup criteria identified in the AOC.

29) *The groundwater modeling needs to include removal or control of the SOEP contamination for us to evaluate the remedy performance of the alternatives presented.*

Response: DEQ agrees that the effectiveness of the capture/injection system would be better represented if source control at the SOEP were included in the model. However, DEQ believes that the capture/injection system will be necessary regardless of the method of source control implemented at the SOEP and STEP ponds. The model does show areas that still exceed cleanup criteria and a re-emergence of the boron plume after the capture system shuts down, but the model also shows that the capture/injection system has a positive impact on the groundwater contamination when compared to other alternatives, despite the continued inputs from the ponds. DEQ acknowledges that some changes to the arrangement of the capture/injection system may be necessary based on selection of the preferred remedy for source control, but this optimization can be finalized during the remedial design phase. If significant changes are required that alter the amount of financial assurance needed, DEQ will require Talen to submit that additional financial assurance. DEQ is also requesting that Talen include an excavation alternative for all of the ponds (SOEP and STEP) in Part 2 of the Report, to better define contributions of COCs from individual sources in the Units 1&2 area. Changes to the water table in the 1&2 area will also need to be provided for each of the alternatives evaluated in Part 2, based on physical changes that may be implemented at the ponds to provide source control.

DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to Comment #2 and the Fact Sheet for more information on the partial approval.

DEQ notes that the model simulations do run past 2050; the simulations pause at 2050 before simulating the remaining timeframe. DEQ is requesting that Talen shorten the pause in the simulation for clarity.

- 30) *Talen should have a plan for perpetual monitoring and maintenance of the STEP if CCR is left in place below the groundwater elevation.*

Response: DEQ is requiring Talen to evaluate excavating the STEP pond in Part 2 of the Report. DEQ is also requiring Talen to provide water table maps for all source control alternatives presented in Part 2 to better demonstrate the effects the various alternatives will have on the water table in the vicinity of the STEP. If the maps indicate the STEP will continue to be within the water table, DEQ will require additional actions by Talen to ensure that the STEP will not act as a continuing, long-term source of COIs to groundwater.

- 31) *Data and modeling used to evaluate contaminants which are trapped in the unsaturated zone need to be described in the RER.*

Response: DEQ agrees that the soils beneath the ponds likely act as secondary sources of COCs, and has discussed this issue with Talen for this area, as well as the Units 3&4 ponds. Talen has conducted some sampling of the soils beneath the SOEP as part of the data collection effort for evaluating source control of the SOEP (Part 2 of the Report). Preliminary analysis of those soils indicated that they do act as a weak secondary source. This site-specific data will be included in the model update in Part 2 of the Report, and Talen will provide a description of how the new data is being incorporated into the model update.

- 32) *Talen should evaluate whether removal of STEP D cell will lead to further increase in the elevation of groundwater under the STEP.*

Response: D Cell was originally scheduled to be filled with ash after the Old Clearwell was full. However, due to Units 1&2 shutting down earlier than originally scheduled, D Cell is no longer needed for ash storage. DEQ will request that the closure plans for the Stage II Ponds be updated based on the final source control remedy selected in Part 2 of the Report. DEQ is also requesting that Talen provide data and figures depicting the water table below the SOEP and STEP ponds through time for each source control alternative in Part 2 of the Report.

- 33) *Talen should use the STEP Clearwell and D Cell for contaminated water management and plan for water treatment capacity sooner.*

Response: Talen completed construction of the new Capture Well Storage Pond at the end of 2019, and the pond began to receive capture water at the beginning of 2020. The pond originally was not scheduled for construction until 2022, but because of the early shutdown of Units 1&2, the pond had to be constructed sooner than scheduled. The pond is designed for capture system water management for the Units 1&2 and Plant Site areas, and will hold up to three years' worth of capture water from these areas. Talen is constructing a water treatment

plant that will be able to treat the water to levels that allow for disposal (method to be determined).

34) *The SOEP source concentration needs to be accurately modeled.*

Response: DEQ agrees, and has already required that Talen collect samples from both the ash and the soil at the SOEP pond. Talen has run leaching tests on both sets of samples, and will be using that data in the updated model that will be provided in Part 2 of the Report.

35) *The pond seepage calculations are in error.*

Response: The Hydrologic Evaluation of Landfill Performance (HELP) software program was evaluated by Talen and determined to be acceptable for this application. HELP was published by US EPA and was developed by U.S. Army Corps of Engineers and Clemson University in 1994. HELP is generally and widely used to estimate infiltration through cover systems, seepage through liner systems, and lateral drainage of liquid (e.g., stormwater runoff and leachate collection) in a landfill under local climate conditions. Available information presented in the calculation packages were used to develop the HELP models. Necessary assumptions and simplifications as described in the calculation packages were made to allow the analysis to be conducted with appropriate effort and prediction accuracy for a remedy evaluation. The analysis was conducted based on the best engineering practice.

36) *Model calibration needs to include the boron retardation factor.*

Response: While Talen did not formally calibrate the model using the boron retardation factor, a conservative value based on empirical site-specific data and consistent with a range of literature values was used so that boron retardation was not underestimated, and would best represent less mobile constituents in groundwater.

37) *Groundwater elevation at the STEP should be compared to the CCR elevation at the STEP.*

Response: DEQ agrees and has made this request to Talen.

38) *Talen should include the STEP Old Clearwell in plans for dewatering and source control.*

Response: DEQ agrees and is discussing this request with Talen. Talen does plan to dewater A Cell and E Cell as part of the partially approved Part 1 of the Report. DEQ is also requesting that Talen evaluate removal of the STEP ponds in Part 2 of the Report.

39) *Talen's ISS evaluation needs to consider that groundwater may be further backed up with ISS treatment.*

Response: DEQ agrees that Talen must consider that implementing ISS treatment will affect groundwater flowpaths and elevations in the Units 1&2 area; DEQ has discussed this with Talen during the monthly updates on the Part 2 Report required by DEQ. Talen will evaluate potential

changes to the hydrogeology in the Units 1&2 Area due to implementation of ISS in Part 2 of the Report.

40) Talen's contaminant mass flux calculation from the SOEP is in error.

Response: DEQ agrees that the preferential pathway created by the presence of the alluvium may be underrepresented in the model, especially considering new data that indicates the alluvium itself will act as a secondary source of contaminants. DEQ is requiring that Talen update the model in Part 2 of the Report with the site-specific data that better represents the SOEP source. Discuss using zonebudget in Modflow with Weston.

41) *STEP underdrain performance needs to be described in the RER.*

Response: The STEP pond does not have an underdrain system; however, B Cell and D Cell both were constructed with double-lined RPP with leachate collection systems. The descriptions of these liner systems are provided in Table 1 of the RER:

B Cell was constructed in 2006, B Cell is double-lined with a 45 mil RPP primary liner, a 36 mil RPP secondary liner, a collection system between the primary and secondary liners, and another collection system beneath the secondary liner.

D Cell was also constructed with double-lined RPP with leachate collection systems.

Although the report sometimes refers to these leachate collection systems as "underdrain systems", this describes the leachate collection between and below the double lined systems for B and D Cell; this is not the same as the underdrain system that is present below the 3&4 ponds. Additionally, pond dewatering at the STEP does not rely on these leachate collection systems; rather, Talen plans to install dewatering wells for A and E Cells to dewater the ash.

42) *The RER should indicate if MNA will be required outside of the Plant Property boundary.*

Response: The model indicates that when the capture system shuts down in 2050, the plume is contained within Talen's property, although the plume is not completely within the pond boundary (DEQ's required point of compliance). When the source (SOEP and potentially STEP) is left in place, the plume re-emerges after capture system shutdown, and does migrate off of Talen's property. Controlling the source should eliminate the need for MNA outside of Talen's property boundary. However, MNA will be required for any area (regardless of ownership) that exceeds cleanup criteria after the capture system shuts down.

43) *All contaminants of potential concern and constituents of interest should continue to be monitored during active remediation.*

Response: DEQ agrees and is requiring Talen to update the Water Resources Monitoring Plan to include all COCs that were identified in the risk assessments. That update will happen during Spring/Summer 2020. Talen will also be required to provide a monitoring plan if the use of MNA is confirmed to be effective and approved by DEQ.



44) Page ix of the Part 1 RER states, "This revised Remedy Evaluation Report – Part 1 incorporates the following: New data collected under the Federal CCR Rule" but the list omits radium. DEQ indicated in their conditional approval letter of the CCRA Report, "Please add text that specifies radium will be sampled under the AOC in addition to CCR Rule requirements, and that radium will be retained as a COPC until an appropriate number of samples (including background samples) have been analyzed."

Response: DEQ agrees and is commenting that radium should be added to this list.

45) Section 2.6.5 states: "The Revised CCRA Report did not identify radium as a groundwater COI/COPC because radium concentrations in groundwater at the SOEP/STEP area are not due to a release from the cells." This should be updated to reflect that radium is a COPC which is still being monitored and evaluated.

Response: DEQ agrees and is requesting the report be revised to include radium as a COPC.

46) Section 6.6 states: "It is estimated that the ash in those two cells would be substantially dewatered by 2050 after which it is assumed that little or no water would drain to the dewatering pipes." The groundwater data is clear that the ash in those cells is below the groundwater elevation unless groundwater hydraulic controls are included in the remedy. This statement should be updated to discuss if the leaky HDPE liner will allow groundwater to keep the CCR saturated in perpetuity.

Response: DEQ agrees that advective flow through the liner should be evaluated as part of the remedy. In addition, DEQ is requiring Talen to evaluate excavation of the STEP in Part 2 of the Report due to continued contact with groundwater.

47) Section 7.5.1 states: "The STEP cells do not contribute to this plume in Alternative 5 because of the dewatering STEP A Cell and E Cell." This is not accurate; the model is based on flawed HELP seepage modeling. In reality, without continued dewatering the STEP cells will continue to leak because they are not able to be permanently dewatered because groundwater will leak through the liner into A, E, and Old Clearwell. This statement should be updated to reflect this unless groundwater hydraulic controls are included in the remedy.

Response: DEQ agrees that seepage from the STEP cells should be evaluated to account for continued contact with groundwater; DEQ is also requiring Talen to provide maps of the water table with respect to the bottom of the ponds in the 1&2 area that take proposed source control measures into account.

48) Section 7.5.1.3 states: "The seepage rate from the STEP cells combined would be reduced from about 14 gpm in 2020 to about 1 gpm in 2050. Therefore, STEP cells are not a long-term source and do not contribute to plume re-emergence." The seepage calculations are incorrect due to a misapplication of the HELP model. This statement should be updated to reflect results of head dependent seepage modeling for the STEP cells.

Response: Additional information on the STEP cells' contribution to groundwater contamination will be provided in Part Two of the report, as part of the source control analysis that will include an excavation scenario for the Stage II Ponds. Also see the response to Comment #35.

49) *NewFields Figure 6-57 shows the depth of saturated CCR at the SOEP is 5 ft greater in Alternatives 4 and 5 versus 2 and 3 (30 vs 35 ft contour at the deepest part of the SOEP). Figure 6-58 shows the saturated volume being the same in all of these alternatives. This needs to be reconciled. If the depth of saturation is thicker, then the volume is greater.*

Response: DEQ will request clarification of this discrepancy.

## NPRC Member Comments

50) *DEQ should approve a Remedy Evaluation Report that requires excavating all coal ash in the Units 1&2 ponds and moving the ash to a secure, lined landfill situated above the water table.*

Response: DEQ is requiring Talen to evaluate excavation of all ponds at the 1&2 area (SOEP and STEP) in Part 2 of the Report. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval.

51) *We cannot have a “wait and see” approach with this cleanup; it must be done right the first time so agricultural producers in the region do not pay the price of poor water quality in the coming decades.*

Response: DEQ agrees that cleanup must be done right the first time. In order to ensure the best method of source control is selected, DEQ is requiring Talen to provide a thorough evaluation of source control options, including full excavation, in Part 2 of the Report.

52) *The ash should be fully dewatered with aggressive pumping, including wells drilled into the ash itself and horizontal capture wells beneath the underdrain.*

Response: DEQ agrees that dewatering the ash is a critical part of the remedy. Talen is currently proposing to dewater ash placed in A and E Cells in the STEP using horizontal dewatering wells. DEQ is discussing dewatering the ash placed in the Old Clearwell at the STEP with Talen. Regardless of additional source control methods (such as excavation) that may be required at the STEP, dewatering will be a necessary part of the remedy. For the SOEP, Talen is evaluating several alternatives to address seepage from the pond, including replacing the cap plus implementing in-situ stabilization, and excavation of the SOEP. These alternatives will be discussed and selected in Part 2 of the Report.

53) *Workers involved in the excavation should be protected with adequate HazMat personal protective gear.*

Response: DEQ agrees that personal protective gear should be required for workers involved in any aspect of the ash pond remediation. Talen will be required to update their Health and Safety Plan to reflect changes that may be necessary based on the remedial alternative selected.

54) *Pollution from coal ash has the potential to do long-term significant damage to the state’s water resources.*

Response: If no actions were taken to address the contamination and pond seepage, the pollution from the coal ash could do long-term significant damage to groundwater (state water

resources). Although the groundwater has already been impacted by the ponds, the AOC was designed to require Talen to address this contamination. Talen maintains an extensive capture system that prevents the existing plume from spreading further. By implementing additional groundwater capture, clean water injection technology, and source control methods to prevent future seepage from the ash ponds, existing damage to the groundwater can be reversed, and prevented in the future.

*55) Removing coal ash and building a landfill to store it properly would create hundreds of good-paying jobs and economic benefits in the Colstrip area that could be sustained for decades.*

Response: DEQ is requiring Talen to evaluate excavation and relocation of coal ash in the SOEP and STEP ponds in the 1&2 area in Part 2 of the Report. Although DEQ does not have regulatory authority over Talen's hiring procedures, DEQ agrees that Talen should use the existing workforce for the remediation work at all of the ponds.

*56) Responsible cleanup would prevent another Superfund story from playing out in Montana.*

Response: Colstrip is being regulated under an AOC, which was an enforcement action taken by DEQ in 2012. The AOC is enforceable under the Montana Water Quality Act and the Major Facility Siting Act. Additionally, the federal CCR Rule (although not regulated by DEQ) provides other enforceable requirements for remediation and operation of coal ash ponds. Because of the multiple enforceable regulations governing the remediation at Colstrip, DEQ does not believe Superfund will be necessary.

*57) Any coal ash in contact with groundwater should be removed.*

Response: Per DEQ's letter to Talen dated April 22, 2019, DEQ will not approve a remedy that leaves a source in contact with groundwater long-term. Any coal ash that is in contact with groundwater must be addressed in a way that eliminates the ash as a potential long-term source. Source control methods for all of the ponds in the 1&2 area (including the lined STEP ponds) will be addressed in Part 2 of the Remedy Evaluation Report.

*58) The companies that profited from these plants need to be held accountable for the cleanup. They need to do the responsible thing and do the cleanup that was expected of them. Do not shift the cost of this cleanup to the taxpayers.*

Response: The AOC requires the operator (Talen) to provide financial assurance to cover the cost of the selected remedy in the Remedy Evaluation Report. Although the AOC does not hold the owners accountable, Talen has an agreement between the owners that requires the owners to provide financial assurance based on their respective pro rata shares of the units. DEQ has required Talen and the owners to submit the financial assurance in the form of surety bonds, which would be released to DEQ if Talen fails to complete the remedy.

59) *The cleanup plan should include long-term monitoring and maintenance of the liners and caps to ensure design integrity and that construction is properly completed.*

Response: Federal regulations require Talen to complete a 30-year post-closure care period for all ponds regulated under the CCR Rule. DEQ acknowledges that inspections will be required to ensure damage from natural processes (such as vermin) is not affecting the integrity of the caps, and is requiring Talen to submit financial assurance to cover these costs.

60) *It is imperative that unnecessary risks be avoided. Too many environmental disasters have occurred because nobody asked what would happen if things went wrong. When choosing a cleanup plan to approve, assume that everything that can go wrong will go wrong, and choose the plan which would have the least impact in such a scenario.*

Response: Talen submits a range of alternatives for comparison, so that the pros and cons of various scenarios can be evaluated prior to selecting an alternative. After an alternative is selected, Talen completes a Remedial Design Work Plan, which provides further analysis and details for the selected alternative prior to implementation. This process is designed to minimize data gaps and provide contingencies should an aspect of an alternative not perform as expected.

61) *Ash pond contaminants were removed from air pollution, mixed with water and are now concentrated in structures more like a mud puddle than a containment structure. Neurotoxins, mutagens, and carcinogens are a foolish legacy to abandon in half-measures.*

Response: The COCs identified in the risk assessment have cleanup criteria that must be met by completion of remedial actions. The cleanup criteria are designed to be protective of human health and the environment, so that adverse effects will not occur as a result of being exposed to groundwater. Additionally, DEQ will not allow Talen to leave a long-term source in contact with groundwater, so the possibility of future contamination is eliminated. Part 1 of the Report is designed to address only existing groundwater contamination from historical seepage and dewatering of the STEP ponds; source control methods (which will include addressing the unlined SOEP pond) will be presented in Part 2 of the Report.

62) *Our State Constitution entitles us to a clean and healthy environment. Our Supreme Court has ruled that this requirement is preventative and that it is a fundamental right. DEQ has a duty to protect citizen's rights and DEQ will be breaching that duty unless DEQ requires a full, comprehensive cleanup.*

Response: DEQ agrees that the Montana Constitution entitles Montana's citizens to a clean and healthful environment. In regard to water resources, the Montana Legislature has enacted the Water Quality Act (Sections 75-5-101, *et seq.*, MCA), in part, to fulfill its obligations under Article II, Section 3 and Article IX, Section 1, the constitutional provisions creating the right to a clean and healthful environment. Thus, bringing Talen Montana in compliance with the provisions of

Montana's Water Quality Act, which is the focus of the AOC, protects the right to a clean and healthful environment.

63) *The Yellowstone river is downgradient from Colstrip and needs to be protected. It is important for our future generations to have access to clean and healthy water. Our resources need to be treated with respect.*

Response: DEQ agrees that natural resources must be protected for future generations. Although the Yellowstone River is downgradient from Colstrip, the distance is great enough that the Yellowstone is not impacted by pond seepage.

64) *The pollution needs to be stopped at its source rather than wait until a cleanup is initiated due to people and animals getting sick.*

Response: The AOC was an enforcement action taken by DEQ to require Talen to address contamination resulting from pond seepage. Although Talen operates a capture system that prevents the plume from spreading further, additional actions are needed to reduce the size of the plume and eliminate future seepage from the ponds. DEQ is not aware of people getting sick as a result of pond seepage, but the AOC process is designed to initiate a cleanup that will prevent adverse impacts to human health and the environment.

65) *Talen cannot cap these ponds in place. These ponds are too big to throw a blanket on and expect it to do any good. The pollution plume will continue to expand and damage the water for all the people of Colstrip, the surrounding farmers and ranchers, and fish and other wildlife.*

Response: DEQ is requiring Talen to evaluate removal of the ponds in Part 2 of the Report. The existing contamination from historical pond seepage will be addressed by implementing the capture/injection system proposed in Part 1 of the Report. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval.

66) *Talen needs to give some of the water rights from the Yellowstone to the City of Colstrip so that the town can continue into the future. The groundwater is most likely already contaminated and replacing the Yellowstone water with groundwater for the city of Colstrip is not an option.*

Response: DNRC is the regulatory agency that mandates water right issues. Talen has stated that Castle Rock Lake (the storage reservoir for the Yellowstone River Water) will remain in existence; some of that water will be required for groundwater remediation under the proposed plan. However, DEQ does not regulate water rights and cannot require Talen to give water rights to the city.

67) *Talen needs to continue pumping the capture wells so that the contamination will not spread. The pumping may be perpetual.*

Response: Talen plans to continue operation of the existing capture wells, in addition to installing more capture wells along with a series of clean water injection wells to address the existing groundwater contamination. The current plan is to operate the wells for 30 years (through 2050); this plan is based on no further action at the SOEP, which currently acts as a continued source to groundwater. The duration of pumping will be finalized when source control measures for the SOEP and STEP are approved by DEQ in Part 2 of the Report; if the model shows the operation of the well network should continue past 2050, DEQ will require continued operation and additional financial assurance to cover the cost of operation.

*68) Water quality must be restored now, before the owners of Units 1&2 walk away.*

Response: The AOC requires Talen to submit financial assurance to cover the costs of the remedial actions selected by DEQ. This financial assurance is being provided in the form of surety bonds, which would be released to DEQ in the event that Talen does not complete the approved remedial actions. This ensures that funding is available to complete the cleanup actions regardless of the status of the operator/owners.

*69) Fair wages must be paid to workers involved in cleanup.*

Response: DEQ does not regulate wages; however, the Coal Fired Generating Unit Remediation Act (MCA 75-8-101-109) requires the Colstrip owners to pay the standard prevailing rate of wages as defined in MCA 18-2-401 for remediation.

*70) The ponds should be closed by the end of 2019.*

Response: Units 1&2 shut down in early January 2020, and the ponds have stopped receiving ash. The SOEP has been closed since the early 2000s. Talen has provided a closure schedule for the ponds as part of this Remedy Evaluation Report. The closure schedule will be finalized in Part 2 of the Report, as some changes may be required based on source control remedial measures at the ponds.

*71) Ash must be dewatered and stored "high and dry".*

Response: DEQ agrees that dewatering the ash is a critical step in controlling future releases from saturated ash. Additionally, in a letter to Talen dated April 22, 2019, DEQ stated that "DEQ will not approve a remedy that allows a long-term source of COIs to remain in contact with groundwater." While the method of source control will not be selected until Part 2 of the Report, the proposed alternative will be required to meet that criteria.

*72) The original cap-in-place of the ash pond in 1997 [at the Stage I Pond] failed, and the pollution risks to wildlife, cattle, and humans is high and severe. Why repeat that bad idea? Other states have dealt with their coal ash problems in a responsible way providing a long-term solution; why can't Montana do this?*

Response: DEQ does not have the regulatory authority to pass a bill that would require source removal. However, in a letter to Talen dated April 22, 2019, DEQ states that “DEQ will not approve a remedy that allows a long-term source of COIs to remain in contact with groundwater”.

73) *Over time water in Armells Creek has gotten worse. Cattle used to drink out of the creek, but now walk across the water and drink out of the water tank from well water, which is not the best. We used to have frogs and turtles in the creek and some fish, but no longer.*

Response: Thank you for your comment. DEQ is enforcing protective cleanup standards that are based on protection of livestock, wildlife, and humans.

74) *In the early 1970s we opposed the building of Colstrip 3&4, in public programs in Missoula. One reason was leakage from ash ponds. A Montana Power engineer objected, saying that concern was “groundless”.*

Response: Please see Response to Comment #27.

75) *We need reassurance that DEQ is not in the pockets of NW Energy. Fix the groundwater permanently.*

Response: Under the AOC, DEQ has the authority to select the final remedy, or a modified remedy presented by Talen, the operator of the plant and the liable party under the AOC. Northwestern Energy owns 30% of Unit 4 and is therefore not involved in remediation related to Units 1&2. However, DEQ will select the remedy that is most effective in addressing groundwater contamination and preventing future sources of COCs from impacting groundwater. This selection will be based on scientific evidence and modeling based on site-specific data.

76) *At a site visit to the 1&2 disposal ponds, it was disclosed that vegetation growing on the capped pond tested for elevated levels of boron. To eliminate this type of concern the ash should be removed and covered.*

Response: The SOEP was closed and capped in the early 2000s with an evapotranspiration cap, which did not include a geosynthetic (plastic) liner. DEQ is requiring Talen to evaluate additional source control measures for the SOEP in Part 2 of the Report. The report will evaluate a range of measures, from re-capping the pond with a geosynthetic liner, to excavation and relocation of the ash. The source control measures will be designed to eliminate future transport of COCs to other receptors in the environment, including groundwater and vegetation.

77) *In Montana’s dry and windy climate, a good plan is needed to stop wind erosion of coal ash.*



Response: Talen was required to submit a “Fugitive Dust Plan” under the Federal Coal Combustion Residual Rule (CCR Rule) that addresses elimination of wind erosion. Talen uses a paste process, which removes most of the free water in the ash slurry and causes the ash to harden into a concrete-like substance. This process minimizes dusting conditions. Additionally, the caps that are installed after the ponds are closed are designed to prevent surface runoff, including erosion from precipitation.

*78) The resolve to this problem should be researched to find any possible valuable minerals, a viable use for the waste, any radioactive danger, the possibility of mixing waste with municipal sewage for potting soil, fertilizer, or other possibilities. The use of wind and solar power should be researched to augment the operation of the plant.*

Response: DEQ and Talen are interested in methods that could be used to recycle the coal ash or otherwise use the ash beneficially. At this time, a viable alternative has not been identified, but DEQ is hopeful an opportunity may be presented in the future that could result in reusing ash from all ponds at Colstrip.

Regarding radioactivity, DEQ previously requested that additional data be collected to determine whether the ponds are a source of radium. The study required sampling of the pond water and of the ash. Pond water samples were below DEQ-7 groundwater standards, and ash samples were consistent with national background. However, due to limited groundwater samples that were above DEQ-7 standards, DEQ has requested Talen retain radium as a contaminant of potential concern as more data is collected.

Because the ash will be dewatered to prevent future seepage and eliminate any contact with groundwater, the ponds will not pose any risk to water sources.

*79) Northwestern Energy should not transfer their economic decisions to rate payers who demand renewable energy.*

Response: The AOC does not regulate ownership of the plant; however, the AOC holds the operator, not the owner, accountable. Talen has agreements with the owners that require the owners to provide financial assurance based on their pro rata share of the plant. However, DEQ is not party to that agreement. Northwestern Energy currently owns 30% of Unit 4, and therefore is not responsible for cleanup related to Units 1&2.

## Northern Cheyenne Tribe Comments

80) *The Northern Cheyenne Tribe incorporates by reference the technical analysis and findings prepared by KirK Engineering.*

Response: Please see DEQ's responses to KirK Engineering's comments.

81) *The owners have been allowed to operate for four decades now in direct violation of Montana water quality law and the plant's original Major Facility Siting Act permit. The owner's and state's failure to act has made a bad problem worse.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #3.

82) *DEQ should require aggressive source control measures that dig out the coal ash sitting in the groundwater and move it to a lined landfill above the water table. DEQ cannot leave unlined or leaking coal ash ponds sitting in the water table.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #4.

83) *DEQ will need to exercise the agency's authority as outlined in Article XIII, Section D, of the AOC throughout the RER approval process in order to protect the community's long-term health and safety and to require Talen Energy to execute a responsible cleanup.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #5.

84) *The capture system daily contaminates even more groundwater, as virgin groundwater is pumped out from the ground via capture wells and piped into storage ponds where it mixes with coal ash. The ash ponds leak 367 gpm, while an estimated 750 gpm are pumped out of the aquifer. This needlessly contaminates 483 gpm of fresh groundwater just to control the spread of pollution.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #6.

85) *While there are active remediation proposals in the RER, including critical in-situ flushing, the Preferred Alternative does not include the single most important strategy needed to remediate pollution at the Units 1&2 ponds—source removal of the ash [at the STEP].*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #7.

86) *DEQ is not limited to approving only alternatives provided by Talen Energy.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #8.

87) *Capping any of these ponds in place will leave coal ash in contact with groundwater long-term, making it impossible to meet AOC cleanup goals in the future.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #9.

88) *The alternatives presented by Talen Energy in this report do not allow DEQ to truly evaluate how STEP ash acts as a long-term source of COIs if it is capped in place. An alternative where both STEP and SOEP ash are removed needs to be evaluated in the Units 1&2 RER Part 2 and weighed against capping any of the ash in place.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #10.

89) *The AOC includes a clear requirement in Article XI that the RERs must contain, among other things, an "Identification and summary of feasible remedial alternatives". Source removal of coal ash is a standard practice for coal ash ponds that sit below the water table. In fact, state legislatures in North Carolina, South Carolina, Virginia and Illinois have all passed laws mandating this as a requirement. Talen Energy's failure to identify source removal of STEP ash as a feasible remedial alternative in this report means they are not meeting this important standard in the AOC.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #11.

90) *None of the alternatives presented in the report achieve the cleanup criteria, as identified in the Units 1&2 Cleanup Criteria and Risk Assessment Report, within all AOC boundaries at the units 1&2 site.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #12.

91) *Pond liners will not act as a permanent barrier between groundwater and coal ash. Because the water table at the 1&2 ponds is elevated above the bottom of STEP ponds, any coal ash capped in place ensures groundwater will remain in contact with a long-term source of COIs. Even if the ponds are completely dewatered and all STEP ash were temporarily dried out, clean groundwater would then well up through pathways in the liners where pond water is currently leaking out from, that groundwater would then mix with coal ash and become contaminated, and then contaminated water would leak back out carrying COIs into the aquifer. Talen estimates the HDPE liners are rated for 400 years in unexposed conditions and 36 years in exposed conditions. No matter how long it takes, when the liners eventually fail there will be a large mass of CCR freshly exposed to groundwater.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #14.

92) *Talen's failure to accurately account for horizontal groundwater flows in the modeling means DEQ cannot truly evaluate how capping STEP ash in place will impact long-term AOC cleanup goals.*

Response: DEQ has a similar comment on the report that is being provided to Talen in DEQ's comment letter. DEQ is also requiring Talen to evaluate removal of the STEP ponds in Part 2 of the report.

93) *Long-term leaching of COIs from STEP ash is not accurately characterized. Talen argues the major source of COIs that contribute to future plume reemergence at the site are from SOEP ash, and therefore source removal is not needed at STEP. However, this does not make sense as it assumes contamination is coming from SOEP ash but not from STEP ash. Talen's decision to leave SOEP ash in place in their model is a clear attempt to minimize the negative impacts that capping STEP ash in place will have on long-term cleanup goals.*

Response: DEQ agrees that leaching from the STEP has not been adequately characterized, and that differentiating the source of plume reemergence is not possible with the current model. DEQ is requiring that Talen evaluate excavation of the STEP, in addition to the SOEP to better characterize the source of plume reemergence. However, DEQ believes that the groundwater capture/injection system will be necessary regardless of source control methods implemented for the ponds, as existing groundwater contamination will still need to be addressed. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval.

94) *The Tribe supports dewatering of all STEP ponds as a needed first step toward excavation. However, there must be clear language in the final approved RER stating this approval does not constitute a long-term source control plan for the STEP ponds. Along with Cells A and E, dewatering of the Old Clearwell should be included and approved in Part I of the report because that cell is currently being filled with coal ash.*

Response: DEQ agrees that dewatering the STEP ponds are a necessary step, and the Old Clearwell should be evaluated for dewatering as well. DEQ also agrees that additional source control will be necessary to stop long-term sources of contamination, and is requiring Talen to evaluate excavation scenarios for both the SOEP and STEP.

95) *The RER must include financial assurance to cover the costs of long-term, likely perpetual, pumping at the Units 1&2 ponds to control the spread of contaminants that in-situ flushing does not remove. Groundwater models in the RER confirm there will be a need for permanent pumping to control the boron plume from rebounding after the capture system shuts down.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #16.

96) *Talen states several times in the RER that "...it should be noted that monitoring in perpetuity is not required for waste disposal sites." We ask DEQ to assess the validity of this claim. Several references are made in the report to "...small isolated Near-Source areas that do not attain the PCC." If Talen Energy is not required to monitor the Units 1&2 site in perpetuity, and DEQ*

*approves a plan that does not attain cleanup criteria in the AOC boundary, we believe DEQ has formally enabled a violation of Montana water quality law in perpetuity.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #19.

97) *There is no proof that removing those contaminants to background concentrations will ever be possible, and while DEQ must require a plan to maximize water quality, minimize degradation, and meet pollution criteria, DEQ must also prepare for the reality of ongoing water pollution by collecting a bond that will cover the cost of long-term pumping at the site.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #21.

98) *There must be several explicit contingency plans to reflect the uncertainty surrounding the effectiveness of the STEP underdrain in fully draining the ponds and limitations on the HELP model used to justify meeting long-term cleanup goals.*

Response: The STEP does not have an underdrain; rather, some of the ponds are double-lined with collection systems built in between the liners. Talen has proposed installing horizontal wells in A Cell and E Cell to provide targeted dewatering of the ash. However, DEQ is also requiring that Talen evaluate removing the STEP ponds entirely to determine if removal would provide better long-term cleanup. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval.

99) *The RER does not meet key standards contained in the 2015 CCR Rule, and DEQ must consider this to ensure the AOC remedy is executed and that water and its uses are protected. Specifically, the CCR Rule requires that free liquids be fully drained from ponds prior to capping and that the base of existing CCR impoundments be 5 feet above the upper limit of the uppermost aquifer. Groundwater elevation at the Units 1&2 site are above the bottom of the STEP ponds. DEQ approval of a cap-in-place remedy means the agency policy is out of line with both of these key federal standards.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #26.

100) *A plan should be implemented to afford Northern Cheyenne Tribal members a preference in coal ash pond cleanup work to mitigate the difficult economic circumstances which will occur when Tribal members lose employment or contracts related to the Colstrip facility. The plan should include a preference for Tribal members to be notified of employment and contracting opportunities at the earliest possible time. The plan should require that those Tribal members who apply be given a hiring preference. The plan should require cultural sensitivity training and other programs to support Tribal members and foster long-term employment for our people.*

Response: DEQ recognizes that operation of the Colstrip Power Plant has provided employment opportunities for members of the Northern Cheyenne Tribe. However, DEQ does not have regulatory authority to ensure that Tribal members are provided notice of employment

opportunities associated with remediation and closure of the coal ash disposal ponds or be granted an employment preference when filling those positions.

## Montana Environmental Information Center Comments

101) *DEQ must reject Talen's proposal and instead follow the requirements of the 2012 AOC, and require Talen to implement a modified remedy, designed by DEQ, that will effectively, permanently, and verifiably remove contaminants from the area and meet the cleanup criteria at the actual point of compliance (the edge of the ponds) for all COCs (not just the two pollutants modeled by Talen, boron and sulfate).*

Response: The AOC does not require a remedy "that will effectively and permanently remove contaminants from the area." That language is not found in the AOC. The remediation alternative selected by DEQ must satisfy the Cleanup Criteria established under the AOC. Cleanup standards have been established for contaminants (characterized as "constituents of concern" in the AOC) in ground or surface water, contaminants in ground or surface water that may impact an ecological receptor, and contaminants in soil. The selected remediation alternative must achieve compliance with standards for all contaminants, not just boron and sulfate. Although the AOC does not specify that the point of compliance is the edge of the ponds, that is the point of compliance being used by DEQ in evaluating and selecting the remediation that will be required under the AOC.

102) *Talen's proposal fails to meet the remedial action objective, which calls for Talen to "control future releases of COIs in groundwater to the extent necessary to achieve the cleanup levels at the downgradient point of compliance in a reasonable period of time."*

Response: Part 1 of the Report was only intended to cover the capture/injection system that will be required to control future releases from secondary sources (i.e., COCs that are trapped in the aquifer matrix and may re-emerge when the capture system is shut down). Part 2 of the Report will address future releases resulting from continued seepage and/or contact between groundwater and the ash by proposing a source control method for the SOEP and STEP ponds. DEQ requires the combination of Parts 1 and 2 to meet the remedial action objectives.

103) *Throughout the document, Talen contemplates making a request to extend the point of compliance. DEQ must be firm. The point of compliance must remain the edge of the ponds, not 150 meters downgradient of the unit boundary.*

Response: DEQ and Talen have agreed that the point of compliance is the edge of the ponds. DEQ will enforce this agreement if needed.

104) *Talen admits that "the model predicts that there is still enough seepage from SOEP for the plume to reemerge," which won't be evaluated until Part 2. Talen's stalling tactics are designed to result in an inadequate remedy and lower bond than is necessary to clean up the site.*

Response: Although splitting the report into two parts is not ideal, DEQ felt that Talen's previous efforts to analyze the needed source control for the ponds was not adequate, and additional

data and analysis would be required to accurately evaluate methods of eliminating seepage and contact between ash and groundwater. By submitting the Report in two parts, DEQ is able to obtain some financial assurance to cover the upgraded capture system and additional injection wells that will be necessary despite source control measures that will be taken under Part 2 of the Report. DEQ has met with Talen on a monthly basis for updates on Part 2 of the report, with the intention that Talen will submit a source control alternative in the Part 2 Report that DEQ concurs with and can select.

- 105) *Talen's failure to design and consider a single alternative that would permanently clean up the site within a reasonable timeframe should result in Talen forfeiting its right to create a viable Remedy Alternative.*

Response: Although DEQ has the right to select a modified remedy under the AOC, the AOC does not provide specific provisions under which Talen would forfeit its right to create the Remedy Report. As previously indicated, DEQ has met with Talen on a monthly basis for updates on Part 2 of the Report and is providing Talen with direction in terms of the alternatives to be considered in Part 2 of the report.

- 106) *One of the most distressing provisions of Talen's plan that clearly indicates its failure to meet the objective is the repeated admission that low mobility contaminants such as boron will reemerge when the capture system is shut down. DEQ must reject Talen's plan based on this provision alone: "In the Distal Area, the fate and transport model predicts that after the capture system is shut down the boron plumes reemerge around 2090 and remain above the PCC in off-site Distal Areas to the east of the STEP Main Dam and north of the SOEP through 2150."*

Response: DEQ agrees that the plumes do not meet cleanup criteria and do re-emerge when only the capture/injection system is implemented. DEQ is requiring Talen to address source control in Part 2 of the report; this will address plume re-emergence because continued impacts from pond seepage and contact with groundwater will be eliminated.

- 107) *Slowing the reemergence of contamination is hardly the standard by which DEQ should approve a remedy. The standard should be whether or not the plume reemerges at all. DEQ must reject any Remedy that admits the contamination will reemerge.*

Response: The capture/injection system is designed to address secondary sources of COCs, such as lower-mobility COCs that are trapped in the aquifer matrix and within zones that are unsaturated due to capture system operation. The system does slow the re-emergence of the plume, but does not completely prevent it because sources of COCs (the SOEP) are still in contact with groundwater. Therefore, eliminating the sources will prevent all aspects of plume re-emergence. DEQ wants a permanent solution, and will not approve a remedy where the plume would re-emerge.



108) *The PRB cannot be considered a “contingency” when Talen admits that it is necessary to meet the objective [cleanup criteria]. At a minimum, DEQ must require installation of a PRB and a bond posted to cover the cost.*

Response: DEQ agrees and has made comments that require Talen to evaluate the implementation of a PRB. Talen will begin pilot studies on the PRB during the remedial design to determine the most effective material for the profile of COCs at the site; DEQ is requiring financial assurance for these studies, and will require additional financial assurance once the cost of implementation is estimated based on the pilot studies.

109) *The remedy should discuss what instances would preclude the use of the PRB and outline the other measures that would be implemented should use of the PRB be infeasible.*

Response: DEQ agrees and is making this request.

110) *DEQ must consider that Talen only evaluated two pollutants in its modeling: boron and sulfate. There is no certainty that the other pollutants from the ash ponds will behave in an identical fashion as boron and sulfate in the groundwater, soils, and subsurface. DEQ should either force the consideration of those pollutants in addition to boron and sulfate or, at a minimum, be extremely conservative in its remedy selection and bonding requirements. DEQ should require extensive testing for these pollutants to establish both the existing base level for each pollutant in each geological stratum as well as estimate each pollutant’s predicted movement and level. DEQ should also require extensive testing for each pollutant in each stratum on a regular basis going forward in order to determine that the cleanup criteria at the edge of the impoundments is met.*

Response: The constituents identified as COCs in the Risk Assessment, as well as the “regulated substances” identified in the AOC, will be monitored as part of the remedy; Talen is updating the Water Resource Monitoring Plan in early 2020 to address this, and to provide additional data for COCs that may have a shorter monitoring history (these are mostly COCs that are currently only monitored as part of CCR Rule monitoring). The COCs (especially the less mobile ones) will also be studied in-depth as part of the MNA study, to better determine how these COCs move in the various layers, and identify attenuation mechanisms in the aquifers.

111) *A permanent pump and treat system should be required if DEQ does not require excavation of the ponds, especially any ponds that are in or near the groundwater table. Bonding must reflect this long-term requirement.*

Response: DEQ is requiring Talen to propose a remedy that will not leave a source in place if it will remain in contact with groundwater and act as a long-term source of COCs. If the groundwater plume will not stabilize by the time the capture system is proposed to shut down, DEQ may require additional pumping until it can be demonstrated that the plume is stable and will meet cleanup criteria at the point of compliance.

- 112) *MEIC endorses and incorporates by reference the comments and concerns of KirK Engineering, submitted by NPRC.*

Response: Please see the responses to KirK Engineering's comments.

- 113) *The proposed schedule for re-evaluating the capture system is insufficient to guarantee the long-term viability of the remedy. The Remedy Report repeatedly admits that contaminants will increase after the injection/capture system closes, yet Talen proposed that it cease to evaluate the system after it closes. This proposal violates the terms of the AOC, which requires an annual review of the financial assurance by DEQ. In order to assure compliance with the law, Talen must submit annually, and DEQ must review, and analysis of the critical components of the cleanup requirements in order to adjust cleanup requirements and the bonds. The bond is tethered to site cleanup and remediation, and therefore, both must be on the same review schedule.*

Response: DEQ will require re-evaluation of the capture system based on the progress of the remedy. Annual monitoring and reporting will be required by DEQ, which will include evaluating pumping rates, geochemical data, pond chemistry, model updates and other data as needed. Annual review of remedial progress will support the annual review of financial assurance. The AOC (Section VI, Part D) requires Talen to "provide an Annual Progress Report if implementation of the remedy exceeds one year and periodic status reports as requested by the Department". DEQ will enforce this requirement, and may request additional reporting, such as during the feasibility studies and other remedy implementation.

- 114) *DEQ should not be constrained in its remedy selection by Talen's desire to avoid applying for an MPDES permit from DEQ.*

Response: Talen's Certificate of Environmental Compatibility and Public Need (Certificate) provides that the power plant is to be a "closed loop water system." Finding of Fact 65 of the Board of Natural Resources and Conservation provides as follows:

That the units as proposed will use a closed loop water system which system does not discharge effluents from the plants into ground water or surface water or large evaporation ponds and therefore will have no effect on the ground or surface water in the area.

Finding of Fact XXIX of the Board of Natural Resources and Conservation and Board of Human Health and Environmental Sciences provides as follows:

A closed loop water system (a system which does not discharge effluents from the plants downstream or into other waters) was adopted from Colstrip Units 1-4 so that there would be no discharge from the plants into the Yellowstone River or other state waters.

Because the Certificate does not allow discharges to surface water, it did not require the operator to obtain an MPDES permit. Selection of a remedy that requires an MPDES permit would require amendment to Talen's certificate. DEQ does not have the authority to unilaterally amend the Certificate.

115) *When the plant closes, it will no longer be viable to use Yellowstone River water and the plants wastewater in facility operations. The loss of a clean water supply for flushing the groundwater, the loss of the ability to reuse the wastewater in the plant, and the lack of an MPDES permit, underscore the need to immediately build and bond for a large treatment system for the contaminated pumped groundwater.*

Response: Units 1&2 shut down in early January 2020. Talen anticipated the shutdown and constructed a Capture Well Storage Pond at the plant site area to temporarily contain captured groundwater. Talen is also constructing a water treatment plant to treat this water, which DEQ already has financial assurance for (this was covered in the Plant Site Remedy Report). DEQ is requesting clarification regarding the final disposal method for the treated water. If Talen proposes to discharge the treated water to surface waters, Talen would need to amend its certificate to allow a discharge to surface water and to obtain an MPDES permit.

116) Talen's proposed financial assurance for its proposed remedy is inadequate to guarantee cleanup, especially in light of the numerous uncertainties, contingencies, and deficiencies noted in the Report. These deficiencies include:

a. *"A groundwater treatment solids disposal area would be constructed to dispose of treatment residuals."*

Response: Regardless of the source control method selected in Part 2 of the remedy, water will have to be treated, which will involve removing and disposing of residuals from the treated water. The groundwater treatment solids disposal area will be constructed at the plant site; financial assurance has already been provided for construction of this disposal area in the amount of \$300,000 as part of the Plant Site Remedy Evaluation.

b. *"A new injection system will have to be designed and constructed to deliver the clean water from the Surge Pond to injection wells until 2022, and either the Surge Pond water or the treated groundwater could be injected thereafter."*

Response: Financial assurance is being provided for the injection system, in the amount of \$2.5 million. If additional treatment is determined to be required, additional financial assurance will be requested.

c. *"A PRB is included in Alternative 5 as a contingency for areas where it is feasible to install one in case it is demonstrated that MNA would not be sufficient to address constituents remaining after capture stops."*

Response: Please see the response to Comment #108.

d. *"If the ash investigation study and subsequent fate and transport modeling indicates that saturated ash is a potential source that requires additional source control measures,*

*the ISS treatability test will be conducted, and the results of the ISS treatability test will be incorporated into the fate and transport modeling. The results of the ash investigation study, updated modeling, and the ISS treatability test (if needed) will be discussed in the Revised Remedy Evaluation Report – Part 2.”*

Response: Since the submittal of this Report, Talen has sampled and analyzed the saturated ash and the aquifer material beneath the SOEP, and has begun running the treatability tests for implementation of ISS. DEQ is also requiring a thorough evaluation of removal of the SOEP/STEP. Both of these source control methods will be evaluated in Part 2 of the Report, and financial assurance for the selected method of source control will be provided upon DEQ approval of Part 2.

- e. *“A geotechnical evaluation is currently underway to evaluate if there are stability concerns that might require adjustments to the proposed injection/capture system near the STEP Main Dam. An injection pilot test will also be conducted to evaluate the injection flow rates that will likely be encountered in the Sub-McKay.”*

Response: Detailed specifications for the capture/injection system will be provided in the Remedial Design Work Plan. Talen has provided a list of the components from Part 1 of the Report that can be approved regardless of the method of source control selected in Part 2. DEQ is providing partial approval of the Part 1 report that authorizes use of these identified components. If changes to the capture/injection system need to be made in the future, DEQ will require the financial assurance to be adjusted accordingly. Please refer to the Fact Sheet for more information on the partial approval.

- f. *“Water from the Surge Pond may require some limited pre-treatment prior to injection into groundwater to reduce long-term maintenance on the injection system. Some additional studies may be required to design the pre-treatment of injected water.”*

Response: DEQ is requesting clarification regarding the use of surge pond water versus treated groundwater, including how the treatment system could be affected by changes in the injection water source, and whether separate facilities would be required to treat the different water sources.

- g. *“Additional groundwater and aquifer solids sampling, testing, and modeling will be necessary to evaluate the effectiveness of the MNA. Additional studies will also be conducted during the remedial design or implementation to assess the reliability of a PRB in addressing residual concentrations (if any) above PCC after 2050.”*

Response: Although MNA would not be needed until after the capture system is shut down, DEQ is requiring Talen to evaluate MNA as part of the Remedy Evaluation Report process and the Remedial Design. DEQ will require financial assurance be submitted to cover the costs of both the additional studies and implementation of MNA (if needed).

- h. Excavation of the SOEP if updated modeling shows the need for additional source control.*

Response: This portion of the remedy in the 1&2 pond area will be covered in Part 2 of the report.

- 117) It is critical that DEQ impose a bond that will suffice for the entire cleanup process, including worst case scenarios of cleanup requirements. Any bond must also include financing for perpetual water treatment. It is essential for DEQ to be explicit that the bond required for the remedy is only the first iteration of a cost estimate that will have to be adjusted over time based on pending studies, investigations, and data collection.*

Response: The bond that will be collected as a result of conditional approval of this report is only part of the bond that will be required to address the entire Units 1&2 area. DEQ has made this clear to Talen, and DEQ may require additional bonding for Part 1 if changes to the system become necessary based on the selected source control remedy in Part 2.

- 118) Should DEQ fail to require a bond to cover all potential costs, DEQ must only provide preliminary or interim approval until all additional studies are complete, and all cleanup and contingency methods are identified, analyzed, subject to public scrutiny, and eventually approved.*

Response: DEQ is only providing conditional approval of this report. Because source control at the ponds was not accounted for in Part 1, DEQ cannot fully evaluate the effects of the capture/injection system. The technology is effective in addressing existing contamination, and will be required regardless of the type of source control implemented. However, changes to the configuration of the capture/injection could be necessary based on how the selected method of source control is implemented, therefore final approval of Part 1 cannot be granted until source control methods in Part 2 have been decided. However, conditional approval triggers the financial assurance requirement under the AOC, therefore Talen will be required to submit financial assurance for Part 1 components.

- 119) DEQ must establish milestones and an automatic increase to the bond in order to address measures and contingencies that eventually must be implemented.*

Response: DEQ requires Talen to include a timeline for implementation of the remedy, and milestones that must be reached during the remedial timeline. If the remedy is not performing as predicted and reaching milestones as expected, DEQ may require additional actions, and corresponding additional financial assurance.

- 120) Because critical information won't be provided until Part 2 of the Remedy Report, this undermines the public's ability to comment on critical measures and it fundamentally undermines DEQ's ability to choose anything less than complete ash removal.*

Response: DEQ acknowledges that the full effectiveness of the capture/injection system cannot be evaluated until the source control methods for the ponds has been determined. This is why DEQ is providing conditional approval of this Part 1 Report. DEQ will also solicit public comments on Part 2 of the Report, which will include an evaluation of complete ash removal.

## Montana AFL-CIO

*121) Talen is currently proposing a cleanup that would consist of limited pond dewatering, allowing some ponds to drain into the aquifer, cap-in-place closure for all ponds, and prolonged groundwater treatment. While this option will be cost-effective, we believe this cleanup method will not stop future contamination from pond closures. Instead, we urge DEQ to require a cleanup that will implement full dewatering and excavation of coal ash site, pond and soil dewatering and capping, and groundwater treatment. This method will adequately clean the environment while protecting taxpayers and preserve the future economic potential of the Colstrip area.*

Response: The Remedy Evaluation Report for the Units 1&2 ponds is being split into two parts. The first part addresses existing groundwater contamination using the capture/injection system. This technology will need to be implemented regardless of the method of source control selected for the ash; splitting the report into two parts allows DEQ to require Talen to submit financial assurance to cover for aspects of the remedy that are known to be necessary, while also allowing DEQ to require Talen submit a thorough evaluation of source control methods for all ponds in the 1&2 area. This will include an evaluation of full dewatering and excavation of all of the ponds, with a proposal for a new location for the ash.

## Other Public Comments

122) *The power plant owners should be held accountable for the entire cleanup, including future monitoring of our groundwater. The ponds have been leaking for many years, poor liners and lack of knowing the full effects of groundwater contamination has created a huge problem for Montana.*

Response: The AOC holds the operator (Talen) responsible for the cleanup; however, Talen has an agreement with the other owners that requires the owners to provide financial assurance for the investigation, cleanup and future monitoring based on their pro rata share of the Units.

123) *Pumping across from town will accelerate the water leaking from Castle Rock Lake. The 700,000 gallons that leak, wash around foundations as the leaking water travels downhill to Armells Creek.*

Response: The distance between the lake and the capture wells is great enough that a direct connection is not present, and therefore pumping will not measurably affect lake seepage. Numerical modeling shows the hydraulic conditions at Castle Rock Lake change little in response to the additional capture and injection that is part of Alternative 5. Simulated seepage from the Castle Rock Lake decreases by 1.5 gpm between current conditions and during simulation of Alternative 5 capture and injection.

124) *There is no guarantee the trailer court property will be cleaned because of location of injection locations.*

Response: The trailer court property was addressed in the Plant Site Remedy Evaluation Report, which utilized a capture/injection system similar to the one proposed in this Report. Groundwater modeling showed the capture/injection system in the Plant Site Area to be effective, addressing all impacted groundwater by 2050.

125) *DEQ needs to hold the power plant owners accountable to clean up the pollution that has occurred with regard to the coal ash ponds for Units 1&2. These ash ponds should not be allowed to be in contact with groundwater after the units cease operation. These ponds were constructed with liners that have failed and leaked from the beginning. This is documented. Ash removal and aquifer restoration is the logical and moral solution that will provide long-term benefits for the community and state. The taxpayers of Montana, instead of wealthy corporations, will bear the cost to clean this mess in the event of a sub-standards cleanup right now. Please hold the owners accountable for the mess they have created while making hundreds of millions of dollars of profits.*

Response: DEQ agrees that the ponds should not be in contact with groundwater, and is requiring Talen to address source control methods in Part 2 of the Report. Part 1 of the Report addresses the existing groundwater contamination using a groundwater capture/clean water



injection system to flush out, capture, and remove the contaminants. The AOC holds the operator (Talen) responsible for the cleanup, and requires the operator to provide financial assurance to DEQ to cover the costs of cleanup in the event Talen does not complete the selected plan.

Regarding the failure of the liners, please see the response to Comment #27.

126) *The current scheme to mitigate pollution at Colstrip 1 and 2 is woefully inadequate in that it does nothing to protect the groundwater. The current plan to just pump the water polluted with coal ash from the groundwater into ponds just to have it leak back out again makes no sense. The fact the ponds are unlined to begin with tells me this entire mess is just “smoke and mirrors” that dates back to Montana Power. The coal ash must be removed, dried out and moved to a separate lined landfill. Other states have used this method to protect their groundwater, so the science is not new or untried.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report. Part 1 is intended to address existing groundwater contamination from historical pond seepage. The current groundwater capture system will be expanded to increase the amount of contaminated water that can be removed from the aquifers. Captured water will temporarily be placed in the newly constructed Capture Well Storage Pond while Talen constructs a water treatment system to treat the impacted water. (Captured groundwater was previously reused in Units 1&2 operations prior to the shutdown in January 2020.) Along with additional capture wells, clean water injection wells will be installed in locations that strategically correspond to capture wells. The injection wells will expedite the process of removing the less-mobile contaminants that are stuck in the aquifer, which would otherwise act as a continual secondary source of contaminants after the capture system is shut down. Although the AOC does not require coal ash in contact with groundwater to be removed, DEQ will not allow Talen to propose a remedy that will leave a source of COCs in contact with groundwater long-term (letter from DEQ to Talen, April 22, 2019).

In regard to the ponds not being lined when originally constructed, please see DEQ’s response to North Plains Resource Council’s Comment #27. After receiving testimony at the original certificate proceeding, the Board of Natural Resources and Conservation found that lining the coal ash disposal ponds with compacted bentonite, while allowing some seepage, would be sufficient to prevent groundwater contamination. If the lining of the ponds with compacted bentonite did not prevent groundwater contamination, the certificate required implementation of extraordinary measures, up to requiring lining of the ponds with a synthetic liner, which the owners of the Colstrip Power Plant have been required to do. Even lining the ponds with synthetic liners have been insufficient to prevent the spread of groundwater contamination in some areas.

127) *I am writing in support of drying out the ponds, digging up the ash, and placing it in a new lined landfill far above groundwater.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval.

- 128) *Colstrip owners need to permanently and effectively clean up the coal ash ponds by storing the waste high and dry. This should be done by drying out the coal ash, digging it up, and moving it to a new, lined landfill far above the groundwater table to prevent leaching of toxic by-products.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval.

- 129) *DEQ needs to hold the power plant owners accountable to clean up the mess that has occurred with regards to the Units 1&2 ash ponds. These ash ponds shall not be allowed to be in contact with groundwater after the units cease operation. These ponds were created with documented failed liners to begin with. Ash removal and aquifer restoration is the logical solution with long-term results. Taxpayers, instead of wealthy corporations, will bear the cost to clean up this mess in the event a poor decision is made today.*

Response: DEQ will not allow Talen to propose a remedy that will leave a source of COCs in contact with groundwater long-term (letter from DEQ to Talen, April 22, 2019). The AOC holds the operator (Talen) liable for cleanup, and requires Talen to submit financial assurance to DEQ to cover the cost of the remedy in the event Talen does not complete the remedy and address the groundwater contamination. In regard to the construction of the ponds, please see DEQ's response to Northern Plains Resource Council's Comment #27 and Other Public Comments #126.

- 130) *DEQ needs to require a proper cleanup which would include removal of ash, drying of ash, and placement into a lined landfill. It's beyond my understanding why this coal ash was ever allowed to be placed into unlined ponds which naturally precipitated a migration into the groundwater. A continuation of the current recycling process is not a solution.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval. In regard to the construction of the ponds, please see DEQ's response to Northern Plains Resource Council's Comment #27 and Other Public Comments #126.

131) *Cap-in-place failed in 1997. The pond for Units 1 and 2 was capped in 1997 and continues to leak 12,000 gallons of wastewater per day. Cap-in-place is at best a poor short-term solution and a completely inadequate long-term solution. Full dewatering and excavation of coal ash (“high and dry”) at Units 1&2 ponds and the Plant Site is a permanent solution. A case study on coal ash cleanup projects across the United States revealed that removing coal ash and dewatering ash ponds that are above the water table is a proven method to stop contamination quickly and permanently. Require Talen to do it right so it doesn’t have to be done later, after pollution has caused problems to the aquifer.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval.

132) *If Talen Energy is allowed to use the “pollute in place” short-term solution, Montana taxpayers will eventually end up paying for the long-term solutions. Even more importantly, the people of Rosebud County will be stuck with the health problems and soil and water pollution that resulted from the cap-in-place temporary solution.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval.

133) *Talen Energy has had years to plan for site clean-up. It is estimated that doing it right will cost Talen approximately \$243 million. A few years ago, Talen paid a bonus of \$500 million to its shareholders. Talen should be able to afford the \$243 million to protect the people who worked for them and the land they used. Talen’s proposal will require approximately 92 yearly direct jobs from 2020 to 2030 and about 40 yearly direct jobs from 2030-2069. Doing the job right—which means aggressive pond and soil dewatering and capping of all ash ponds—will result in approximately 219 direct jobs from 2020-2030 and 66 direct jobs from 2030-2040.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report, which will be submitted to DEQ in Spring 2020. Although Talen provides cost estimates for the range of remedial alternatives presented, the AOC does not require cost to be a factor in selecting the most effective alternative. DEQ will select the alternative that is most protective of human health and the environment, and best achieves the cleanup criteria and eliminates the potential for future releases.

134) *During the permitting process in the 1970s and later in 1980s for Colstrip Units 3&4, the State assured local residents and area ranchers that these coal ash ponds “would never leak,” but, from the beginning, the ponds have leaked. The State officials had even told the Colstrip residents*

*and ranchers that if the ponds leaked, they would shut down the plants. That did not happen despite years of complaints along with credible data showing leakage and harm.*

Response: Please see DEQ's response to Northern Plains Resource Council's Comment #27 and Other Public Comments #126.

135) *Colstrip Units 1&2 coal ash ponds actually sit within the area's water table. Talen Energy's RER plan for the Units 1&2 ponds as submitted to Montana DEQ is to simply cap the ponds in place. This is totally unacceptable. No matter what cap is placed on top of the pond, polluted water will continue to spread down into the ground and into the region's aquifer. Pumping the groundwater back into the ponds as is currently being done will have to be done in perpetuity—and that will never solve the problem. Talen Energy's plan must remove the coal ash from the ponds and store it properly—dry—to even begin to solve the problem. The coal ash ponds must be drained, and the coal ash dried out, dug up, and then stored in an approved, lined waste facility high above the water table. Aquifer pumping must continue—and the water treated—until the aquifer is restored to its original cleanliness.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report. The capture/injection system proposed in Part 1 is currently scheduled to run through 2050; however, if groundwater capture is needed past that date, DEQ will require the duration of capture to be extended, and the financial assurance adjusted accordingly.

136) *The corporate owners must pay for the mess they made. Do not shift this toxic waste legacy onto the taxpayers.*

Response: The AOC holds the operator (Talen) liable for the cleanup, and requires Talen to submit financial assurance to cover the cost of remediation. Talen has a separate agreement among the other owners that requires the owners to provide financial assurance for remediation based on their pro rata share of the units. Therefore, DEQ holds financial assurance from all six owners.

137) *The 1&2 and 3&4 process water ponds have been leaking since their construction more than 30 years ago and consequently the plume of leaked plant process water has expanded significantly through the years. The groundwater capture wells seem to be holding the plume at its current extent for the most part, but the wells do not capture all of the leakage and wells that have subsequently been installed have revealed newly contaminated areas.*

Response: DEQ recognizes that the current capture system does not capture all of the seepage from the ponds; however, the upgraded capture system with the addition of the clean water injection wells will contribute to remediating the existing groundwater contamination. Source control of ash seepage is crucial for permanently fixing the contamination; this will prevent future seepage and additional groundwater contamination.

138) *The only option for discontinuing the migration of groundwater is to fully de-water all ponds with aggressive pumping, including wells drilled into the ash itself and horizontal capture wells beneath the underdrain.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report. Regardless of the source control alternative selected, the ponds will be required to be dewatered; Part 1 of the Report proposes installing horizontal dewatering wells in A and E Ponds. DEQ is providing partial approval of the Part 1 report, authorizing those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval.

139) *The Colstrip ponds will continue to leak as long as bedrock is in contact with saturated coal combustion materials present in the impoundments and effluent and process water from the generating units.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report. This will include source control methods for all ponds in the Units 1&2 area, not just ponds that are constructed directly on bedrock. Preliminary data collected by Talen for the SOEP pond indicates that the alluvium beneath the pond acts as a weak secondary source of COCs; therefore, the alluvium will also be required to be addressed.

140) *An adequate remedy to lessen and minimize area groundwater needs to include releasing the head pressure of the ponds, dewatering of underlying sedimentary bedrock and unconsolidated sediments by utilizing underdrains and a well capture system, and removal and excavation of coal combustion materials from the ponds. Dewatering will allow removal of the materials with a temporary, artificially lowered water table. An effective prescribed cap will need to be installed following the removal.*

Response: DEQ is requiring Talen to evaluate ash removal and other source control alternatives in Part 2 of the Report. Dewatering of the A and E Cells at the STEP using horizontal dewatering wells has been proposed by Talen in Part 1 of the Report. This measure will be needed regardless of the source control methods proposed in Part 2. DEQ is providing partial approval of the Part 1 report, authorizing only those components that can be implemented regardless of the source control method(s) that will be selected in Part 2. Please refer to the Fact Sheet for more information on the partial approval.