# Colstrip Steam Electric Station Units 3&4 Coal Ash Ponds

Montana Department of Environmental Quality

## Units 3&4 Remedy Evaluation Overview — February 2020

### Introduction

The Montana Department of Environmental Quality (DEQ) is providing this fact sheet on the Units 3&4 Remedy Evaluation Report as part of a responsiveness summary addressing public comments received by DEQ.

In August 2012, DEQ and Talen Montana entered into an Administrative Order on Consent (AOC) to address impacts from ash pond seepage. The AOC is an enforcement action taken by DEQ, and involves a step-by-step plan for remediation of the groundwater downgradient of the ash ponds. For each of the three sets of ponds, Talen submits four reports to DEQ:

- A Site Characterization Report
- A Cleanup Criteria and Risk Assessment Report
- A Remedy Evaluation Report
- A Remedial Design/Remedial Action Report

This Fact Sheet is intended to summarize the remedial alternatives analyzed by Talen in the Remedy Evaluation Report for the Units 3&4 Effluent Holding Pond (EHP) Area, and to provide additional information received from Talen since the submittal of the report in August 2019. The full report can be found at the following link: https://deq.mt.gov/DEQAdmin/mfs/ColstripSteamElectricStation

### Summary of Evaluated Alternatives

To determine the most effective remedy for the 3&4 Area, Talen evaluated five remedial alternatives:

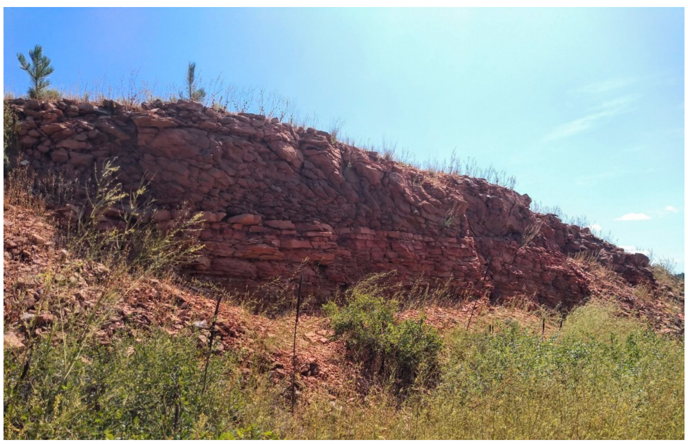
- Alternative 1: No Further Action: Used as a baseline to evaluate what would happen if no additional remedial actions were taken.
- Alternative 2: Cap and dewater ponds; continue running existing capture system
- Alternative 3: Cap and dewater ponds; expand groundwater capture system
- Alternative 4: Cap and dewater ponds; expand groundwater capture system; install clean water injection wells
- Alternative 5: Excavation and relocation of ash to a new, lined landfill; expand groundwater capture system

Talen modeled each of the alternatives to determine the relative effectiveness of the various remedies. Based on the models and other site data, Talen has identified Alternative 4 as the preferred remedial alternative. The main rationale for this decision is that the ponds will not remain in contact with groundwater after they are dewatered and capped. Site data and modeling indicate the majority of contamination that needs to be addressed is contamination already present in the groundwater from historical pond seepage. Talen has already begun taking measures to reduce pond seepage, including using a paste process that removes water from the ash before it is placed in the impoundments. Additionally, by July 2022, Talen is required to switch to dry ash storage at the 3&4 ponds, reducing future seepage from additional ash deposition. These practices, along with dewatering the ash using the existing underdrain and capping the ponds with a geosynthetic liner system, will prevent additional pond seepage and eliminate contact between the ponds and the groundwater.

Excavation (Alternative 5) was not selected as the most effective alternative because of the time required for implementation and movement of the material to a new potential source. Excavation would require planning and permitting a new landfill and moving the large amount of material to a new location; this process would take years, leaving the ash exposed to additional precipitation, meaning the ash would be saturated for a longer period of time. Additionally, because the majority of contamination is the result of historical seepage, groundwater remediation would still be required in the 3&4 area; the model indicates that groundwater cleanup would take longer under Alternative 5 due to continued seepage from the ash during the excavation phase.

### Selected Alternative Overview

DEQ has selected Alternative 4 with modifications in the form of additional contingencies that must be addressed as the remedy is implemented. Because the majority of the contamination in the 3&4 area is the result of existing contamination from historical pond seepage, Alternative 4 includes aggressive measures to remove this contamination from the groundwater. While more mobile contaminants (such as sulfate) can be removed from the groundwater using groundwater capture wells, less mobile contaminants (such as boron) have a tendency to stick to the aquifer material, making it harder to remove them with capture wells alone. When the less mobile contaminants remain in the aquifer material, they have the potential to re-mobilize, making them a secondary source that could re-contaminate the aquifer in the future. Using clean water injection wells helps avoid this scenario: clean water is injected into the aquifer, which forces the less-mobile contaminants to become "unstuck" from the aquifer material, allowing them to be removed from the groundwater by the capture wells. The injection and capture wells are strategically placed so all the water that is injected is captured immediately downgradient, preventing the contamination from spreading.



Based on modeling, active remediation followed by "Monitored Natural Attenuation" or MNA is predicted to achieve the cleanup criteria at the point of compliance (the edge of the ponds) in most areas, with the exception of the deepest geological unit.  No identifiable alternative (including excavation) would achieve the cleanup criteria at the point of compliance. This is primarily due to the geology in the 3&4 area. The Sub-McKay is the deepest unit and is composed of tight bedrock, making it harder to flush and pump this particular unit.  However, in many cases, plumes will naturally decrease in size and concentration over time so long as the source is eliminated. When this is the case, MNA can be implemented. MNA consists of long-term monitoring that demonstrates the plume is stable, not expanding, and not a risk to human health or the environment. Talen is proposing to use this method after the capture system is shut down to continue to address less mobile contaminants that may remain. Talen has conducted an initial desktop study that indicated the use of MNA is promising, but Talen needs to conduct additional studies, both in a lab and in the field, to verify the plume will stabilize and decrease over time. If Talen cannot demonstrate this, DEQ will require additional methods (for example, continued pumping) to ensure the plume will be stable and that cleanup criteria will be met.

## Contingencies

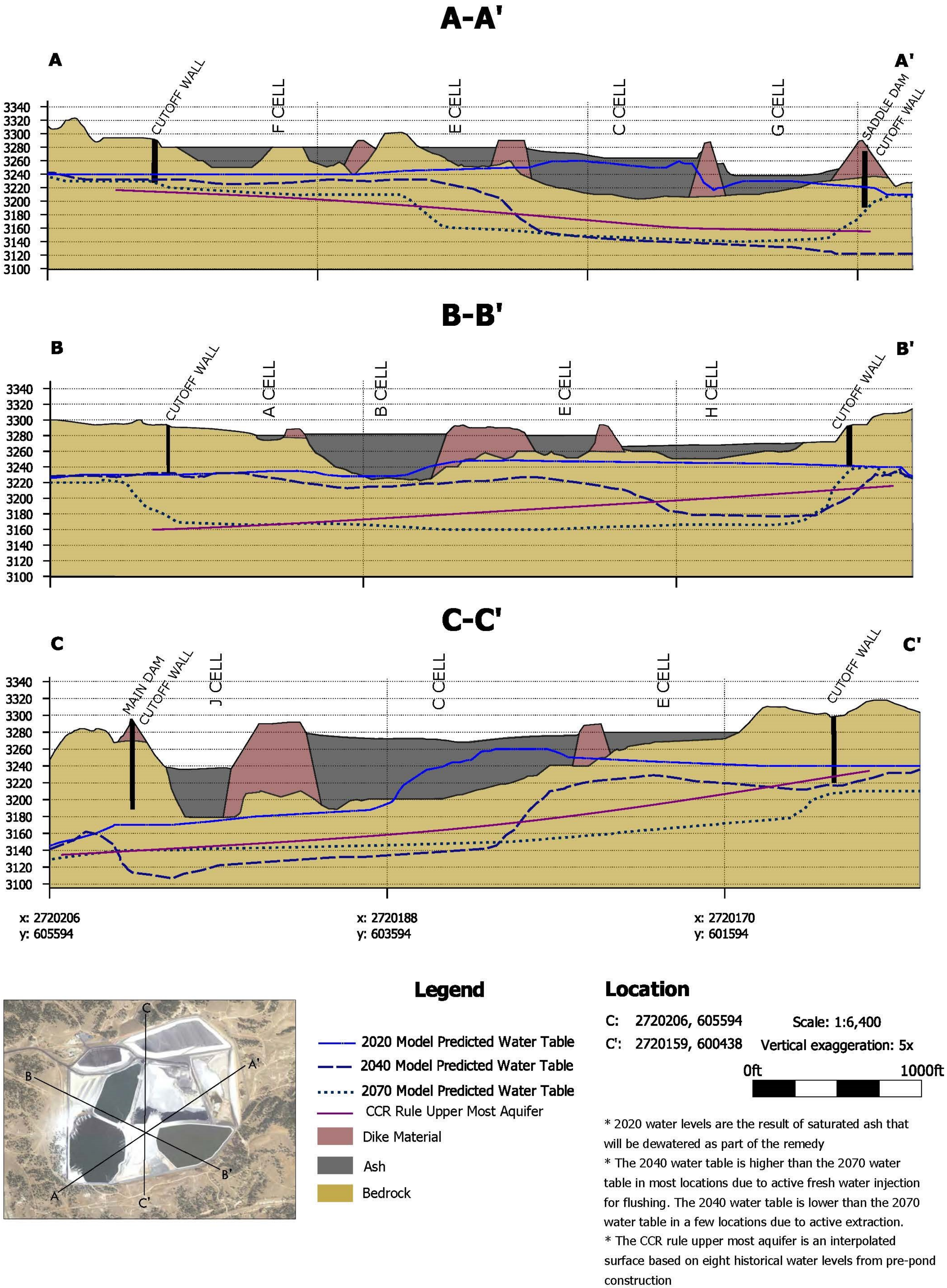
DEQ believes the capture/injection system combined with capping and dewatering the ponds will be effective, and is issuing a conditional approval of the Units 3&4 Remedy Evaluation Report. The conditional approval will require Talen to submit financial assurance in the amount of $107 million. However, DEQ is requesting additional data be collected, and additional measures be evaluated to ensure all aspects of the proposed remedy will be optimized to achieve plume stabilization and mitigate any impacts to human health and the environment in a timely manner. Under the AOC, DEQ has the authority to request changes or additional measures at any time. Additionally, financial assurance will be updated on an annual basis, to account for changes that may be needed. DEQ is requesting the following contingencies be evaluated as part of the conditional approval of the report:

- Conduct a pumping test on the underdrain to ensure it will completely dewater the ponds. If the underdrain will not be effective, additional methods will be required (ex: well points) to dewater the pond in a timely manner.
- Provide additional information about the water budget at the 3&4 ponds to ensure the underdrain can be turned on as soon as possible. If there is not enough storage for the underdrain to be turned on by 2021, additional storage will need to be constructed.
- Additional data needs to be collected to support the predicted timeframe for MNA. This includes geochemical data from pond leachate and aquifer solids beneath the ponds, which may act as a secondary source. This will help determine how long active remediation (injection and capture) needs to continue.
- Provide more detail regarding the water table below the ponds during capture/injection system operation, and after the system shuts down.
- Conduct feasibility studies to determine if a Permeable Reactive Barrier would be appropriate in this area.
- Update the model to include any new data collected.
- Install additional capture and injection wells as appropriate. If data indicates the remedy would benefit from running the injection and/or capture wells for a longer duration, financial assurance will be requested to keep the system running.

## Next Steps

Due to the complexity of the Units 1&2 Pond area, the Remedy Evaluation Report for has been split into two parts. Part 1 addresses the groundwater remediation for existing groundwater contamination, and Part 2 will address long-term source control for all of the ponds. DEQ is currently responding to Part 1 comments and a Fact Sheet will be provided as part of the responses, and will be posted on DEQ's website. DEQ anticipates receiving Part 2 for review in Spring 2020.

Talen provided the figure below showing the elevation of the water table relative to the bottom of the ponds in 2020 (current), 2040 (during pumping) and 2070 (20 years after pumping ceases). Although the ponds are currently within the water table, modeling shows the water table will drop below the base of the ponds once they are dewatered and capped.



53710

Montana Department of Environmental Quality

Waste Management and Remediation Division
PO Box 200901
Helena MT 59620

Name
Address
City, State Zip

## For more information or to be added to the Colstrip email listserv, please contact:

Sara Edinberg
DEQ Project Manager
(406) 444-6797
sedinberg@mt.gov

Terri Mavencamp
Cleanup, Protection & Redevelopment Section Supervisor
(406) 444-5595
tmavencamp2@mt.gov