

# Stakeholder Meeting 1<sup>st</sup> Quarter 2023 Update

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## *COLSTRIP STEAM ELECTRIC STATION Remedial Activities April 3, 2023*



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Colstrip Environmental Project Officer  
Waste Management & Remediation Division





# LOGISTICS

Welcome and thank you for participating in DEQ's Colstrip Stakeholders Meeting. Please read the following tips about participating in this hybrid meeting:

- All Zoom participants have been automatically muted. Please remain so until called on to speak. You will need to be given permission to unmute. Once you have spoken, please re-mute yourself.
- On Zoom, use the “raise hand” feature in the app to indicate that you would like to speak. For those in the room, please also raise your hand.
- If you are called on to speak, please identify yourself by stating your first and last name.
- You may also use the chat box and/or Q&A (Zoom webinar) to type your questions.
- If you are joining by phone:
  - Press \*6 to mute/unmute yourself.
  - Press \*9 to raise your hand.
- Visit the following link for helpful tips about using Zoom software:
  - <https://support.zoom.us/hc/en-us/articles/201362193-Joining-a-meeting>

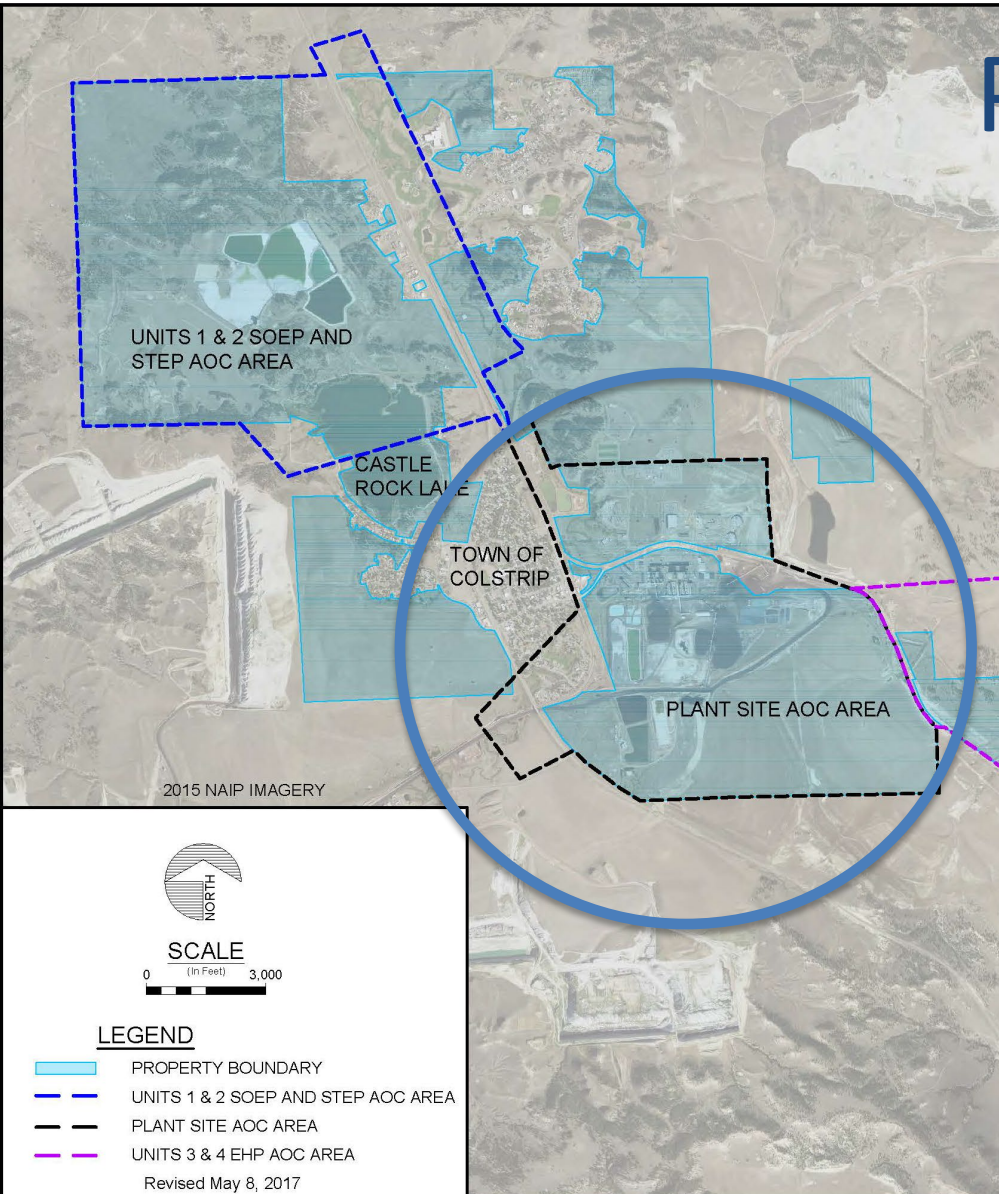
# Agenda

- Quarterly Update on Plantsite –
  - Operate and Optimize Groundwater Flushing/Capture System
  - Pond Closure Evaluation and Update – May 2023
- Quarterly Update on Units 1&2 –
  - Remedy Startup
    - Flushing/Capture system operation – February 2023
  - Remedial Design Ongoing
    - Model Update Completed and Presented to DEQ – March 2023
    - RD/RA Work Plan – April 18, 2023
    - No update on 11A
- Quarterly Update on Units 3&4 –
  - Remedy Startup - Flushing/Capture system operation – Q2 2023
  - Dry disposal completed by October 31, 2022
  - RD/RA Work Plan – late March/early April 2023
- Site Wide Issues
  - CCR Discussions with EPA and Talen Montana – Oct/Nov 2022
  - Water Feasibility Study – Submitted and DEQ Completeness Review in progress
- Talen Remedy/Closure Financial Assurance Bonding
  - DEQ in comprehensive FA review – AOC requires every 5-years (2022)
    - DEQ requested additional back-up and updated cost sheets March 2023
    - Updated bonds Q2 2023
  - DEQ continues to hold \$306M in bonds



# Plant Site Remedy

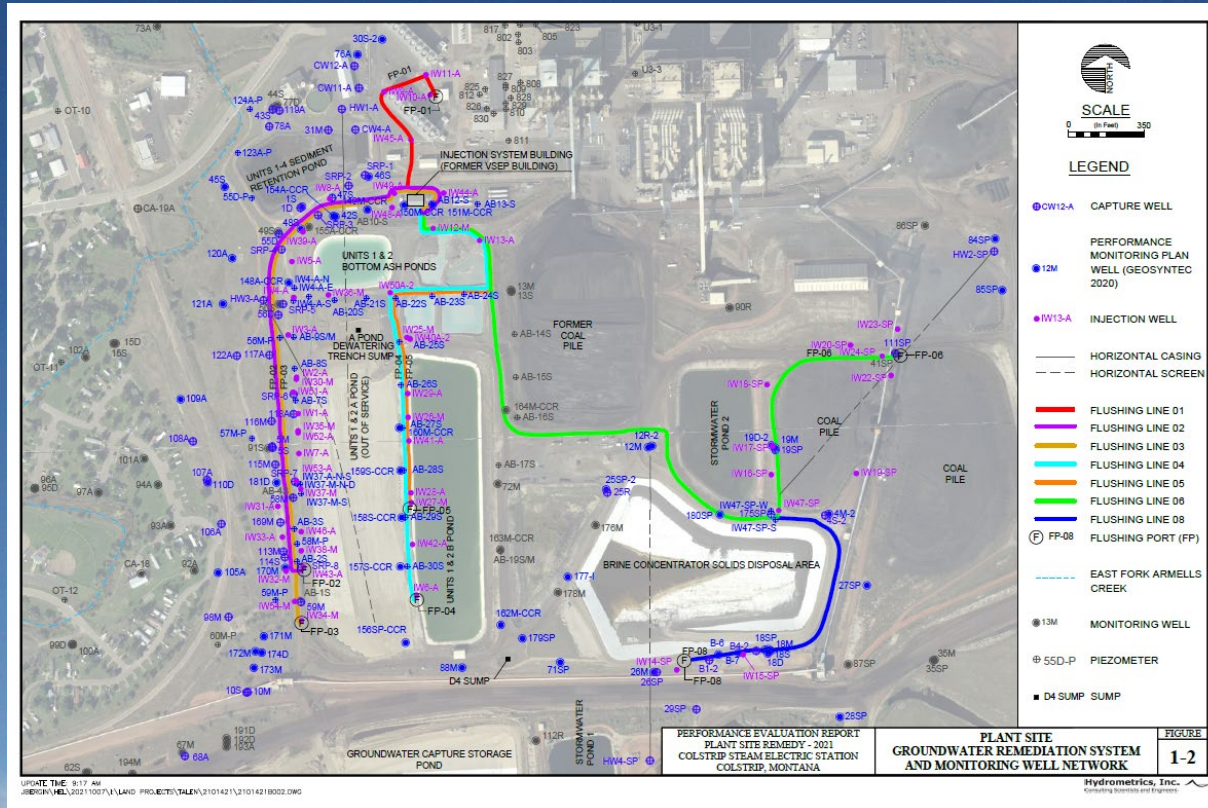
- Approved remedy addresses groundwater contamination from coal ash process/disposal ponds
  - Closure of ponds and ash dewatering (in place)
  - Freshwater flushing and groundwater capture system
- Additional Measures:
  - Monitored Natural Attenuation (MNA)
  - Permeable Reactive Barriers (PRB)





# Plant Site – Groundwater Flushing/Capture

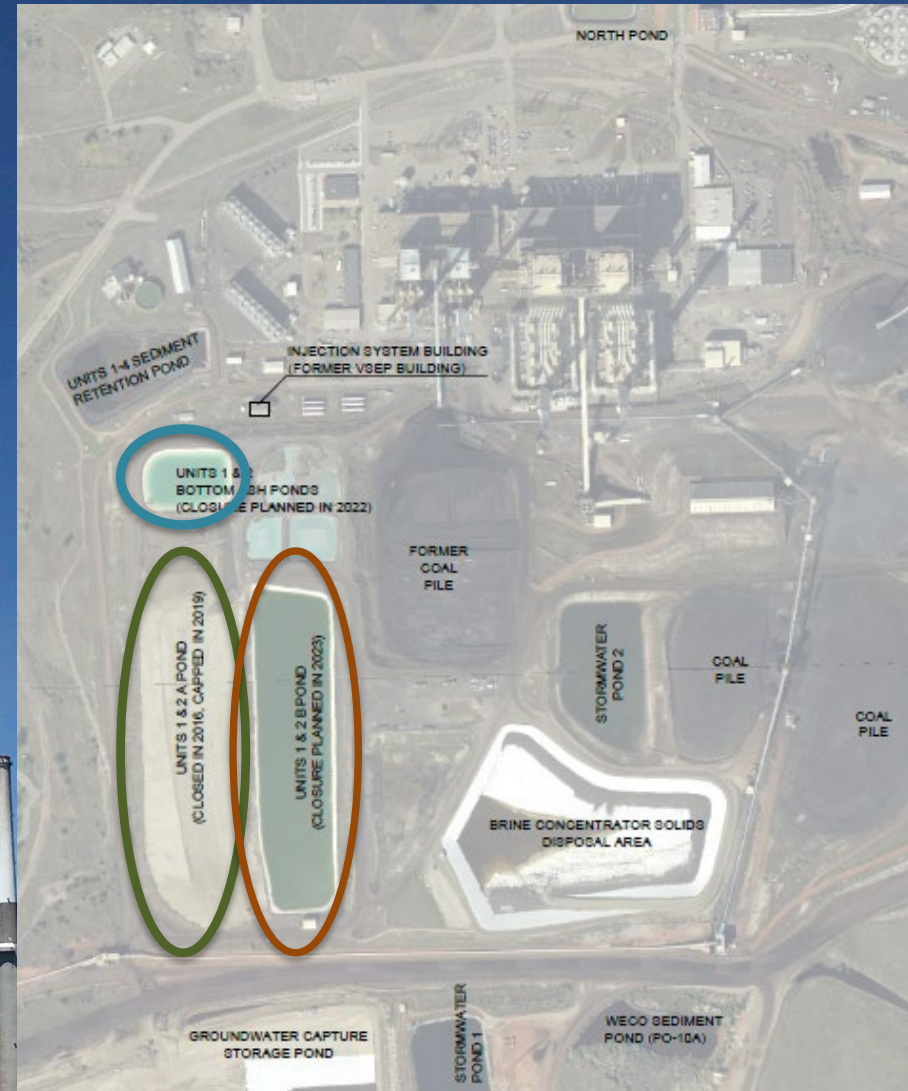
- Operate and Optimize Groundwater Flushing/Capture System
- Started GW Capture/Flushing Remediation in July 2020
- Updated analytical to be presented in next Annual Hydrologic Report – April 2023





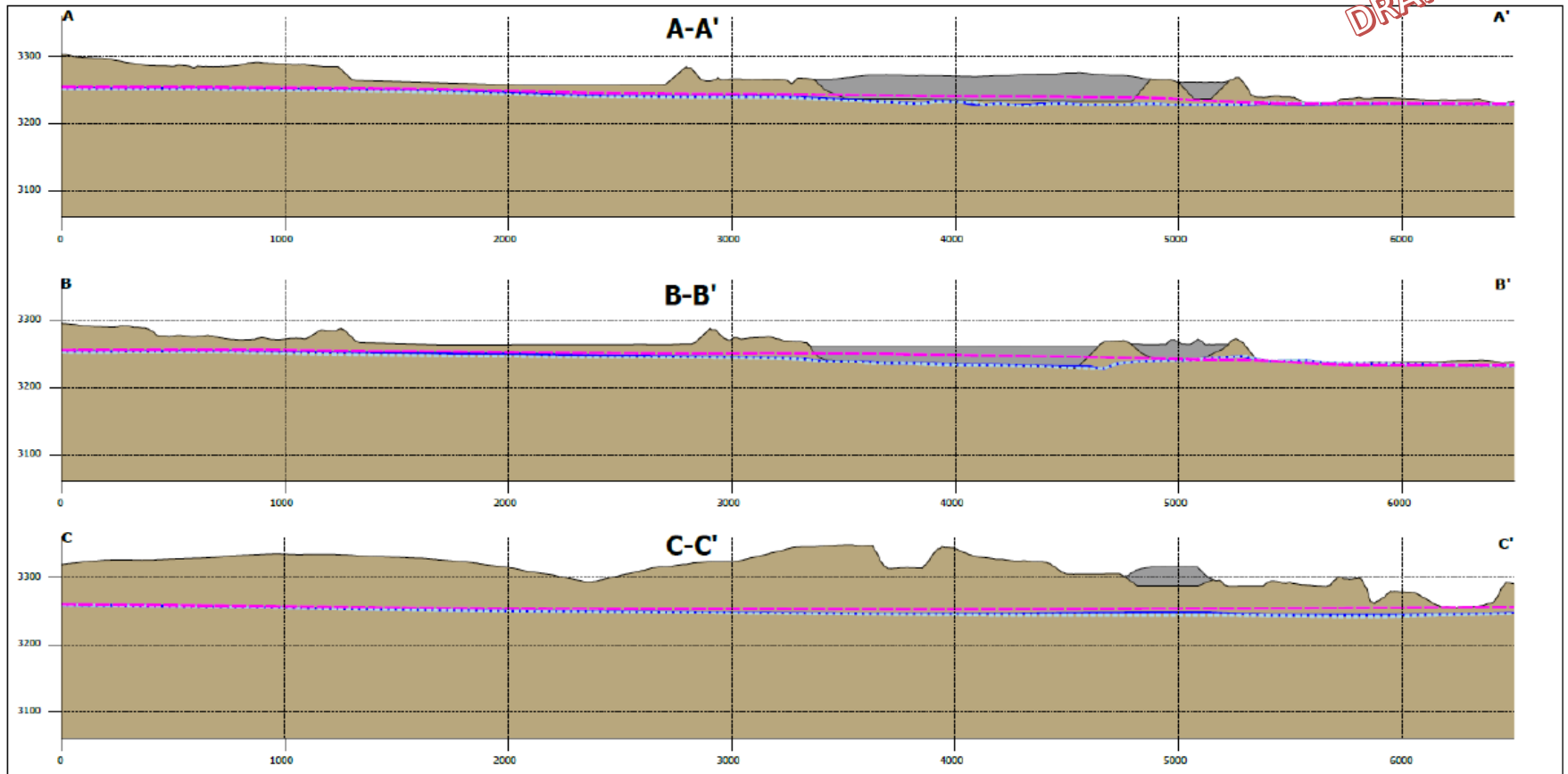
# Plant Site Ponds

- Pond closures and planned closures - recent
  - **Units 1&2 A Pond** – Closed in place/cover added 2020-2021
    - Dewatering active
  - **Units 1&2 B Pond**
    - Units 1&2 B Pond stopped receiving water from Units 1&2 SOEP/STEP in Q2 2022
  - **Units 1&2 Bottom Ash and Clearwell**
    - Had planned start closure 2022
- DEQ/Talen discussion on closure design for **B Pond** and **Bottom Ash/Clearwell Pond**
  - Agreed to delayed Closure Activities – Jan 2023
  - Model Updates – Completed March 2023
  - Evaluation in progress – Talen submit to DEQ by May 1, 2023



# Plant Site – Pond Closure Evaluation

Figure 1 – Colstrip Plantsite Pond Simulated Groundwater Levels



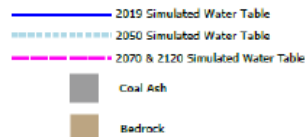
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Vertical exaggeration: 3x



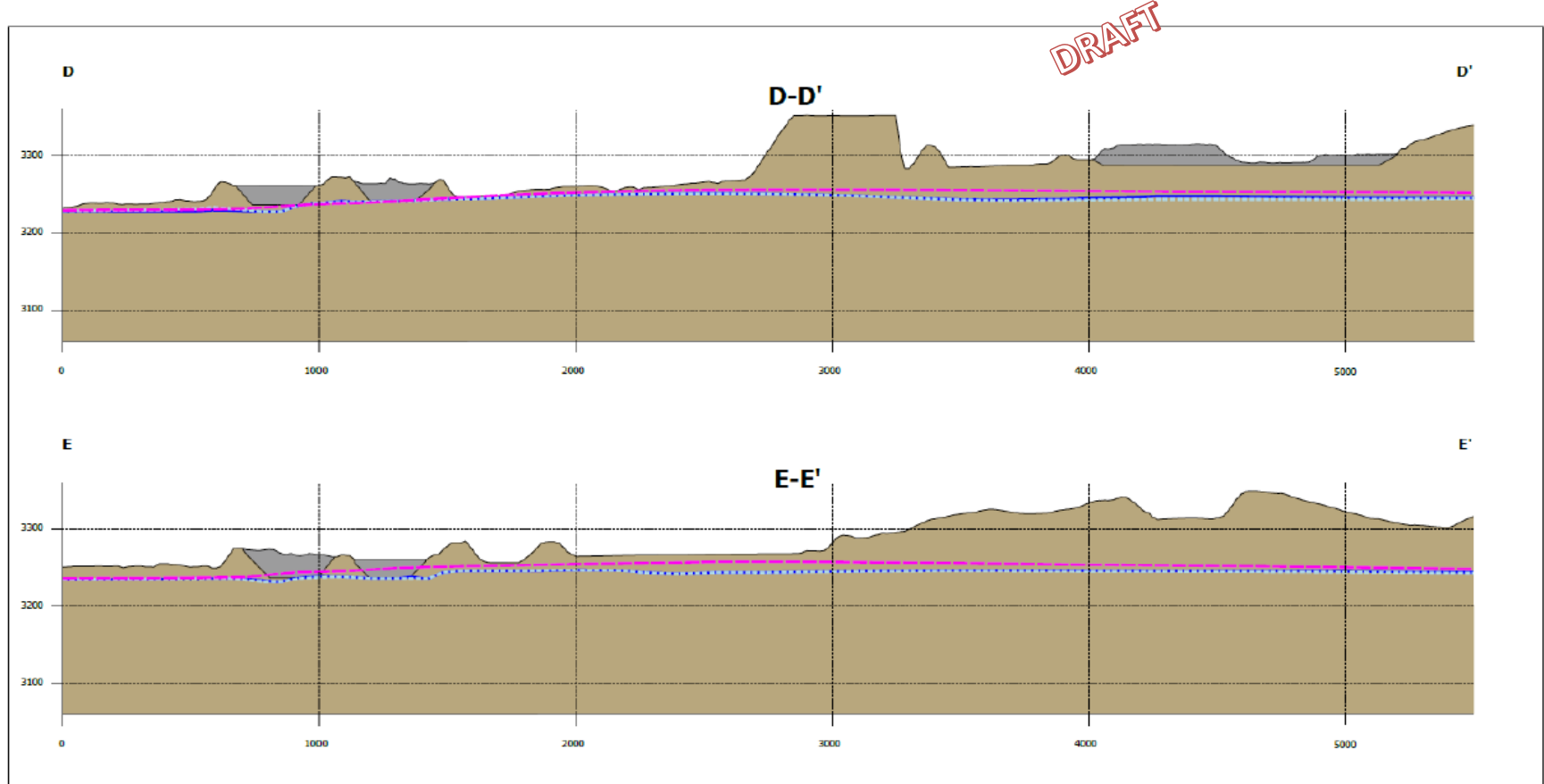
NewFields



Simulated Water Tables along Cross-Section A-A', B-B', and C-C'  
Plant Site  
CSES-Colstrip, Montana

# Plant Site – Pond Closure Evaluation

Figure 2 – Colstrip Plantsite Pond Simulated Groundwater Levels



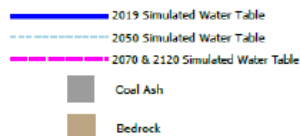
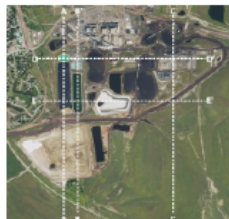
**DRAFT**

Scale: 1:4,600

Vertical exaggeration: 3x



**NewFields**



Simulated Water Tables along Cross-Section D-D' and E-E'  
Plant Site  
CSES-Colstrip, Montana



# Units 1&2 SOEP/STEP Remedy

- Approved remedy addresses groundwater contamination from coal ash process/disposal ponds and cells
  - Ash dewatering
  - Ash removal to a new landfill
  - Freshwater flushing and groundwater capture system
  - Additional Measures:
    - Monitored Natural Attenuation (MNA)
    - Permeable Reactive Barriers (PRB)

UNITS 1 & 2 SOEP AND  
STEP AOC AREA

CASTLE  
ROCK LAKE

TOWN OF  
COLSTRIP

PLANT SITE AOC AREA

2015 NAIP IMAGERY



SCALE

0 (In Feet) 3,000

## LEGEND

- PROPERTY BOUNDARY
- - - UNITS 1 & 2 SOEP AND STEP AOC AREA
- - - PLANT SITE AOC AREA
- - - UNITS 3 & 4 EHP AOC AREA

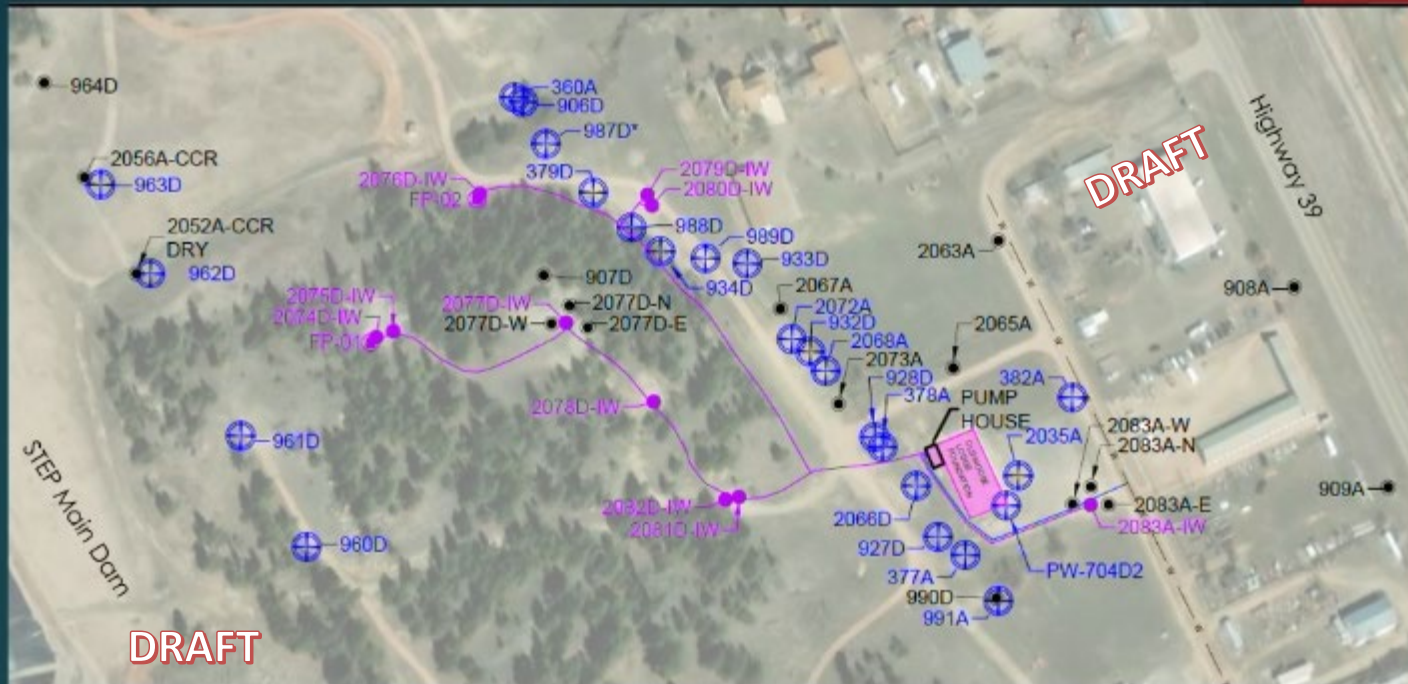
Revised May 8, 2017

# Units 1&2

- Groundwater Remedy Starting –
  - Small-Scale Capture/Flushing System
    - Started intermittently December 2022
    - Full-time operation February 2023
- Remedial Design/Remedial Action (RD/RA) Work Plan
  - Quarterly Discussions – March 28<sup>th</sup> (most recent)
  - RD/RA Workplan – April 18, 2023
  - Remedial Design Ongoing
    - Updated Units 1&2 SOEP/STEP Model – Appendix J of RD/RA Work Plan
    - Landfill design – 75% in RD/RA Work Plan
      - Hydrogeological – ongoing analysis
      - Design – ongoing design general layout with cut/fill, leachate collection system and cover (multiple cells not designed yet), stormwater collection
    - Ash Excavation/Transport Design – dewatering on-going at A and E cells
- Alternative 11A – No update
  - Talen has not initiated discussion or presented substantive factors in quarterly meetings



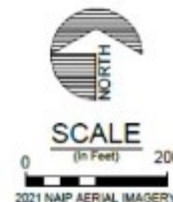
# Remedy – Small-Scale Flushing/Capture System



## LEGEND

- 2074D-IW ● INJECTION WELL
- INJECTION WELL PIPELINE
- FP-01 ● FLUSHING PORT

- 960D ⊕ CAPTURE WELL
- 908A ● MONITORING WELL
- CITY WATER PIPELINE
- WATER SUPPLY LINE



**Hydrometrics, Inc.**  
Sustainable Science and Solutions

First Quarter 2023  
Units 1 & 2 SOEP/STEP AOC Progress Meeting

Small Scale Flushing System  
Startup Progress

Date  
3-28-23

## Changes Implemented

- Conceptual Model Updates [TALEN and DEQ](#)
  - Groundwater Occurrence and Flow
  - Hydraulic Properties
  - Water Quality
  - Site Operations
- Numerical Model Updates
  - Geometry [DEQ](#)
  - Parameterization [TALEN and DEQ](#)
  - Calibrations
    - 2005, 2014, and 2021 Steady-State Calibrations [TALEN and DEQ](#)
    - 2010 Aquifer Test Calibrations [TALEN and DEQ](#)
    - 2005-2007 Transient Flow Calibration – Old Clearwell Breach [TALEN and DEQ](#)
    - 2017-2021 Transient Flow and Solute Transport Calibration [DEQ](#)
    - 2021 Injection Pilot Test Calibration [TALEN and DEQ](#)

Notes: [DEQ](#)= DEQ Initiated [TALEN](#)= Talen/NewFields Initiated

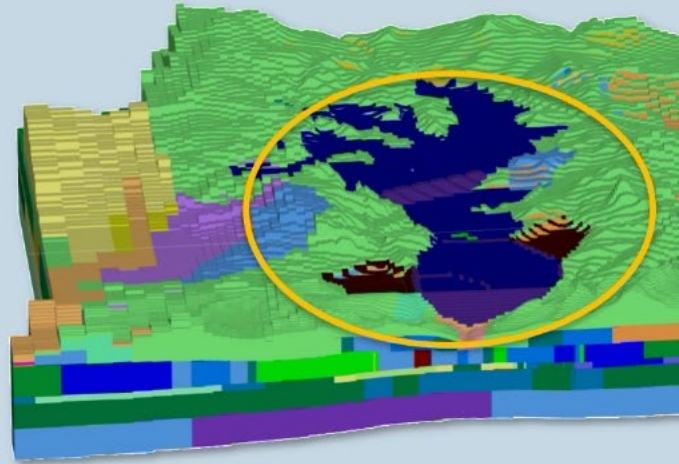
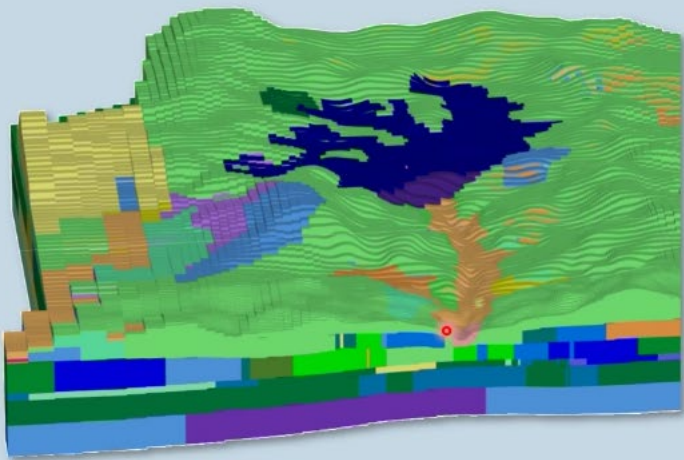




# Units 1&2 Model Updates – Conceptual and Geometry

- Updated top of Layer 1 using Lidar data, Ash and Dam material
- Added model Layer (2) to facilitate simulation of STEP Ash

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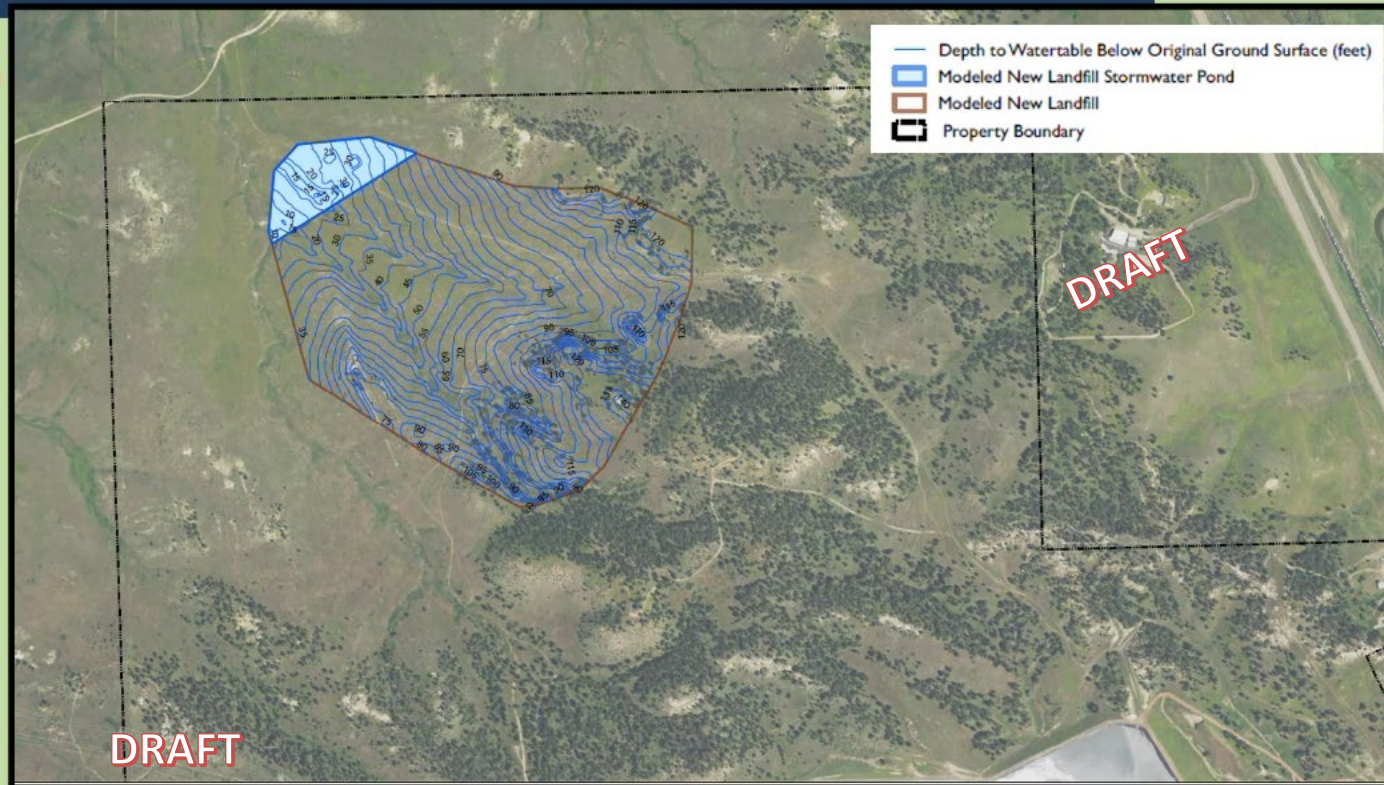


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NewFields

# Units 1&2 Model Updates – Landfill

## Model Forecasts Landfill Area

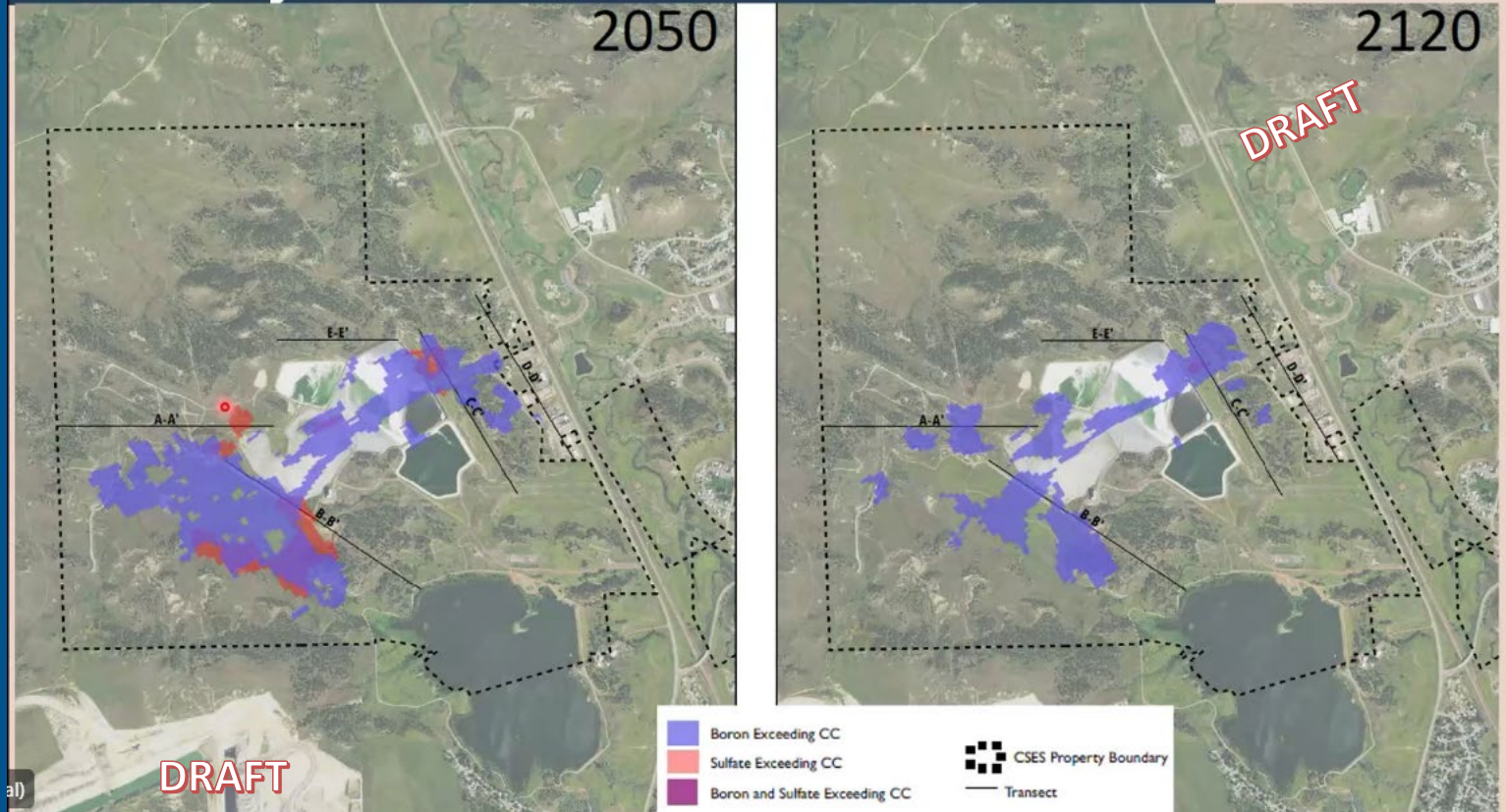


NewFields



# Units 1&2 Model Updates – Remedy Simulation

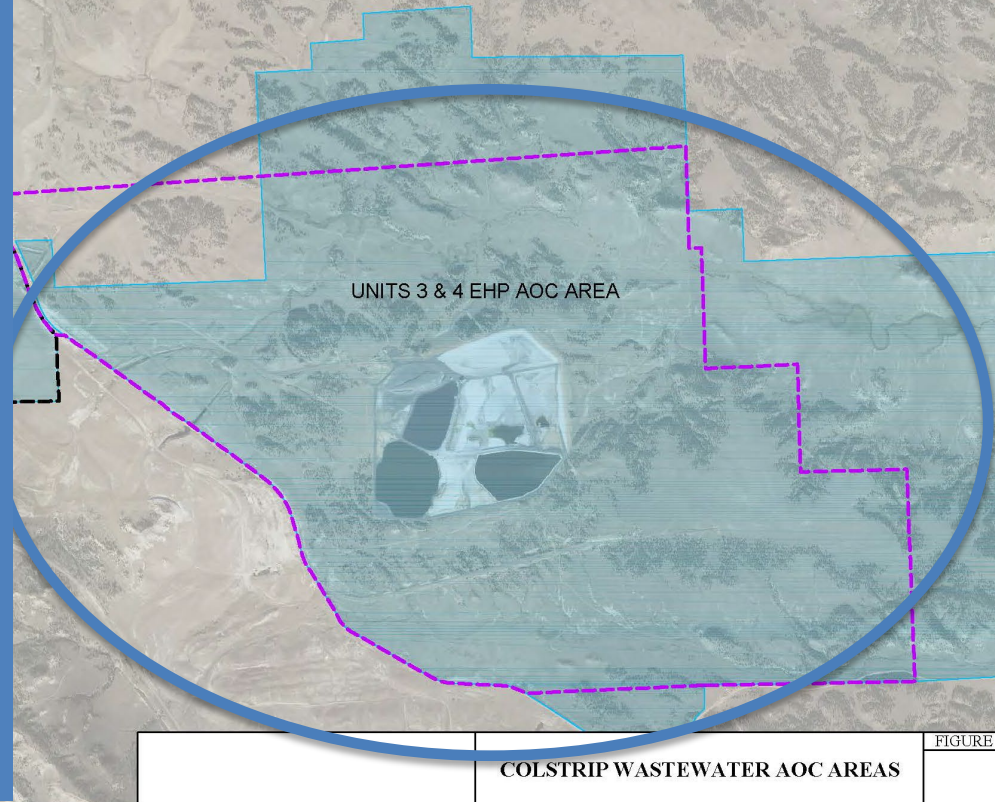
## Remedy Simulation





# Units 3&4 EHP Remedy

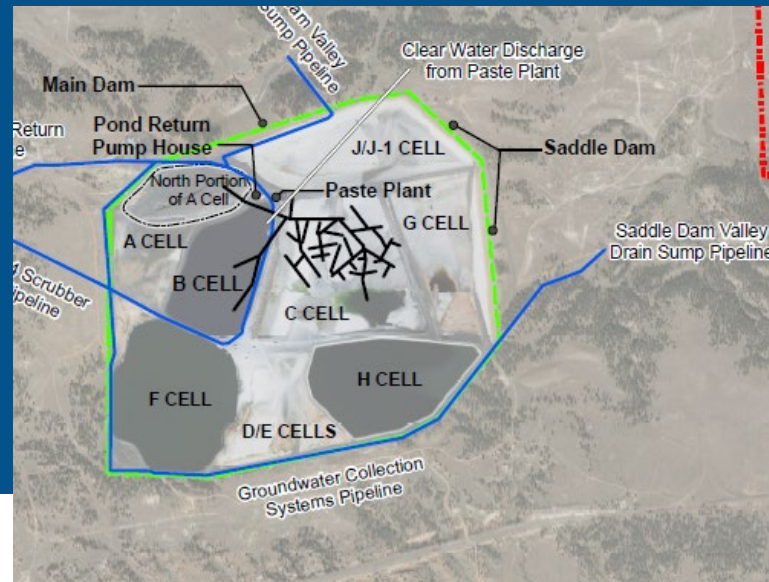
- Approved remedy addresses groundwater contamination from coal ash process/disposal ponds and cells
  - Cell Closures & Ash dewatering
  - Freshwater flushing and groundwater capture system
  - Additional Measures:
    - Monitored Natural Attenuation (MNA)
    - Permeable Reactive Barriers (PRB)





# Units 3&4

- Groundwater Remedy Starting –
  - Capture/Flushing System
    - Anticipated Q2 2023 – delays on final system components
- Remedial Design – RD/RA Work Plan late March/Early April 2023
  - MNA and PRB Studies – On-going
- Dry disposal installation progress – Started October 31, 2022
  - First Report Q1 2023





# Site Wide Discussions – Q1 2023

UNITS 1 & 2 SOEP AND  
STEP AOC AREA

CASTLE  
ROCK LAKE

TOWN OF  
COLSTRIP

PLANT SITE AOC AREA

UNITS 3 & 4 EHP AOC AREA

2015 NAIP IMAGERY



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## LEGEND

-  PROPERTY BOUNDARY
-  UNITS 1 & 2 SOEP AND STEP AOC AREA
-  PLANT SITE AOC AREA
-  UNITS 3 & 4 EHP AOC AREA

Revised May 8, 2017

COLSTRIP WASTEWATER AOC AREAS

FIGURE

Hydrometrics, Inc.  
Consulting Scientists and Engineers

UPDATE TIME: 8:50 AM  
JBERGIN\BIL\20170508\F\LAND PROJECTS\TALEN\1207116\1207116B006.DWG



# CCR Rules – Federal EPA

- Talen Montana responsible for self-implementing and reporting for CCR Rule Compliance – website
- <https://www.talenenergy.com/ccr-colstrip/>
- DEQ participated in discussions
  - EPA and DEQ discussions Jan-August 2022
  - Between EPA and Talen Montana – October 2022
  - Talen responded to EPA – November 2022
- EPA Contact: Doug Knappe – Region 8 EPA - POC
  - <https://www.epa.gov/coalash>
  - CCR Rules
    - Potential permit rules – 2023
    - Potential legacy CCR pond/landfill rules – 2023-2024
    - Evaluation of Beneficial Use – Unencapsulated
- DEQ will continue to be part of future discussions





# Water Feasibility Study (§ 75-8-110, MCA)

- Component of the Coal-Fired Generating Unit Remediation Act
  - Submitted by Colstrip Owners on November 1, 2022, as required
  - DEQ sent completeness determination letter to Plant Owners on January 11, 2023
- DEQ recognizes that the Study's Chapter 8 Planning Section also includes continued commitment by the Plant owners to work in conjunction with the City on an agreement:
  - infrastructure transition;
  - infrastructure maintenance and reconfiguration;
  - refined cost estimates based on City resources, and responsibility of costs;
  - liability concerns for assuming responsibility for the infrastructure; and
  - additional details on water rights access or updates.



# Water Feasibility Study

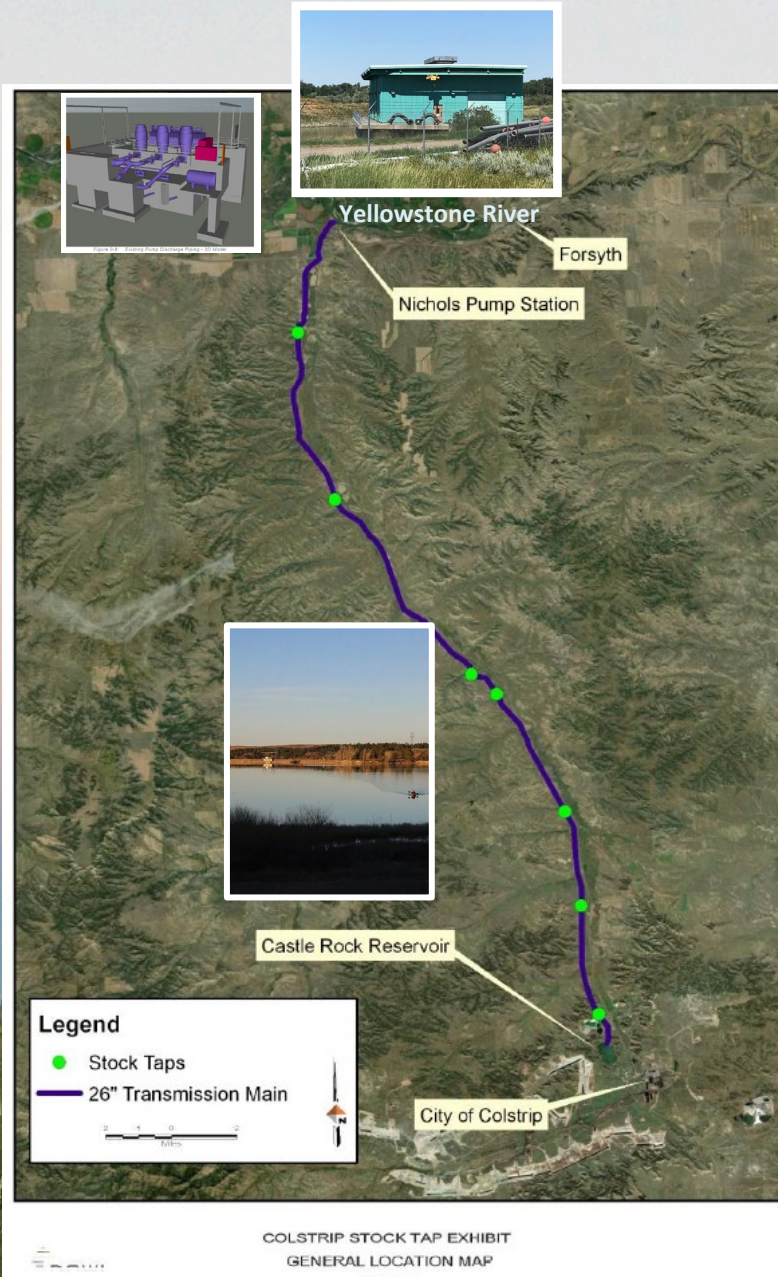


Table 2-21: Projected 2049 Water Demands

Projected 2049 Water Demand									
Month	City of Colstrip (MGD)	Power Plant Remediation (MGD)	Castle Rock Lake E&L (MGD)	Miscellaneous Agricultural Users (MGD)	Combined Average Daily (MGD)	Total Monthly Use (MG)	New Pump Rate Required* (cfs)	Approx. Existing Pump Runtime Hours Required per month (Single Pump)	Spray Wash (MGD)
Jan	0.412	0.965	0.162	0.060	1.60	49.57	3.09	97.2	0.0493
Feb	0.427	0.965	0.164	0.060	1.62	45.24	3.13	88.7	0.0498
Mar	0.438	0.965	0.166	0.060	1.63	50.49	3.15	99.0	0.0502
Apr	0.437	0.965	0.588	0.060	2.05	61.48	3.96	120.5	0.0632
May	0.508	0.965	0.770	0.060	2.30	71.39	4.45	140.0	0.0710
Jun	1.047	0.965	0.826	0.060	2.90	86.95	5.61	170.5	0.0893
Jul	1.398	0.965	0.857	0.060	3.28	101.67	6.34	199.4	0.1011
Aug	1.388	0.965	0.785	0.060	3.20	99.15	6.19	194.4	0.0986
Sep	0.940	0.965	0.606	0.060	2.57	77.13	4.97	151.2	0.0792
Oct	0.528	0.965	0.164	0.060	1.72	53.23	3.32	104.4	0.0529
Nov	0.473	0.965	0.163	0.060	1.66	49.83	3.21	97.7	0.0512
Dec	0.420	0.965	0.259	0.060	1.70	52.81	3.29	103.5	0.0525
Average	0.701	0.965	0.459	0.060	2.19	66.58	4.23	130.5	0.1

## ALTERNATIVES CONSIDERED

(BOLDED RETAINED FOR COST EVALUATION):

**Alt PMP 1: Operate Pump Station "As Is", Budget for Equipment Replacement**

Alt PMP 2: Operate Pump Station "As Is", Replace Mechanical Equipment Up Front

**Alt PMP 3: Convert Pump Station, Install Two Smaller Pumps and Keep One Large Pump**

**Alt PMP 4: Convert Pump Station; Install Three Smaller Pumps**

Alternative 5: Install New Surface Water Intake, Pump Station

Alternative 6: Retrofit Pump Station and Install New Booster Station and Pipeline Directly to Colstrip Water Treatment Plant

Alternative 7: Pursue Groundwater Source Using Wells and New Water Treatment Plant

Alternative 8: Pursue Alternative Surface Water Sources

Alternative 9: Replace Existing Pipeline & Appurtenances



# Water Feasibility Study – Next Steps

- What it did...
  - Costs defined more adequately,
  - Infrastructure, and operation of the system, better understood
  - Water Rights understood/clarified
    - Owners planning to update water rights based on historic use
- What it is not...
  - An agreement between the local government and the Plant owners
- Local government still concerned with assumptions, costs, water rights, and agreements
- DEQ is helping initiate Owner/Stakeholder Group Updates to facilitate discussions and written commitment toward feasible solutions/agreements between the Plant Owners and the Local Government
  - No less than annually, City prefers quarterly



# AOC Financial Assurance

- Financial Assurance – Under AOC for Colstrip SES to “ensure the operation and maintenance of remedial and closure actions carried out under [the AOC]”
  - Every 5-Year Comprehensive Review
  - First Comprehensive Review under the AOC (signed in 2012) that includes remedies selected for each AOC Area
- 2022 Financial Assurance – Comprehensive Review
  - October 2022: Started with Talen’s Financial Assurance Cost Estimates
  - November 2022: DEQ met with Talen to discuss task descriptions, assumptions, and costs
  - Nov 2022 – Jan 2023: DEQ’s review continued with Talen adding line-item costs or adjusting costs, and refining the assumptions based on November meetings
  - Jan – March 2023: DEQ’s comprehensive review
  - March 17, 2023: DEQ submitted a letter to Talen requesting additional line items and some cost back up data based on the comprehensive review
  - April 17, 2023: Talen will submit new cost estimate spreadsheets
  - April/May 2023: DEQ will request surety bond updates after review of the changes
- DEQ continues to hold surety bonds in the amount of \$306.3M



# AOC Financial Assurance

Colstrip Owners	Financial Assurance (FA) Provided as of Jan. 2022 <sup>1</sup>
Talen	\$112.7 million
Puget Sound Energy	\$124.3 million
Northwestern Energy	\$17.3 million
Portland General Electric	\$23.1 million
Avista	\$17.3 million
PacifiCorp	\$11.5 million
Total	<b>\$306.3 million</b>

1: DEQ revisits and reviews FA annually, every 5-years DEQ comprehensive review.  
DEQ is currently performing the comprehensive review (2022)



# Next Steps

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## Site Wide:

- Annual Hydrologic and Remedial Progress report – April 2023
- PNNL Cow Creek/Pony Creek Annual Report – May 2023
- Annual E. Fork Armells Creek Synoptic Run Sampling/Report – June 2023

## AOC Plant Site:

- Continued remedy implementation
- Pond Closure Evaluation – May 1, 2023
  - Pond Closure Starts or Pond Closure Design – July/August 2023

## AOC Units 1&2 SOEP/STEP:

- Optimization of Small-Scale Flushing/Capture Groundwater Treatment System
- RD/RA Workplan – April 2023
- Landfill Design Materials – Oct 2023
- Potential Request to Amend Remedy (Alt 11A) – Oct 2023

## AOC Units 3&4 EHP:

- Startup for clean water flushing – May-July 2023
- RD/RA Workplan – Early 2023

## Remediation Act – Water Feasibility Study –

- DEQ Coordination and facilitate meetings
- Annual Rem. Act Plan Report – March 2023

- Questions/Comments

Montana DEQ's mission is **to champion a healthy environment for a thriving Montana.**







# References

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*DEQ Colstrip Coal Ash Pond Cleanup Website:*  
<https://deg.mt.gov/cleanupandrec/Programs/colstrip>

*MCA Title 75 Chpt 8 – Coal Fired Generating Unit Remediation Act:*  
[https://leg.mt.gov/bills/mca/title\\_0750/chapter\\_0080/part\\_0010/sections\\_index.html](https://leg.mt.gov/bills/mca/title_0750/chapter_0080/part_0010/sections_index.html)

*Talen CCR Rule Website:*  
<https://www.talenenergy.com/ccr-colstrip/>

*EPA Region 8 CCR: Doug Knappe (Knappe.Doug@epa.gov)*



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## *COLSTRIP STEAM ELECTRIC STATION Remedial Activities April 3, 2023*



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