Coal Ash Assessment

State Water Commission

December 4, 2017

SB 1398

- Passed by the General Assembly in the 2017 session.
- Required an assessment of all of the ash ponds in the Chesapeake Bay watershed including:
  - Evaluation of closure by removal with recycling or reuse;
  - Evaluation of closure by removal with placement of ash in a landfill;
  - Evaluation of closure in place;
  - Demonstration of the long term safety of the coal ash pond; and
  - A description of the groundwater and water quality surrounding each ash pond and an evaluation of corrective active measures if needed.

Coal Ash Regulations

- The U.S. EPA put in place ash regulations (“the CCR Rule”) that were effective April 2015.
- The intent of the rule is to reduce risk of future ash pond failures by requiring closure or upgrades.
- The rule includes:
  - Structural integrity standards to ensure safety of structure
  - Inspection and public disclosure requirements
  - Groundwater monitoring
  - Closure requirements such as dewatering and capping in place or removal
  - Standards for new ash landfills

Coal Ash

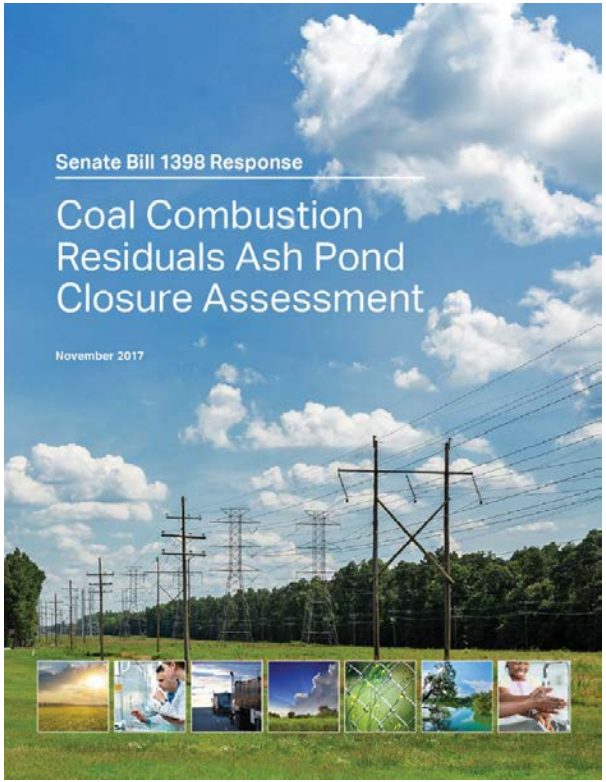
- Byproduct of producing electricity at coal-fired power stations. It can be:
  - Recycled for use in products like concrete;
  - Stored in on and off-site landfills; and/or
  - Stored in on-site ponds, where ash settles to the bottom.
- Dominion has four facilities with 11 ash ponds that are in the Chesapeake Bay Watershed. We will close all 11 ponds:
  - 5 at Possum Point;
  - 3 at Bremo;
  - 2 at Chesterfield; and
  - 1 at Chesapeake.

Dominion Energy

The Report

The Report

- Dominion Energy hired AECOM to conduct the assessment.
- Every option evaluated and that was feasible is fully protective of safety, human health and the environment.
- The options vary widely in terms of:
  - their impact on local communities resulting from the closing process;
  - the time it will take to complete the closures; and
  - the potential cost.
- In some cases, the options may take longer than permitted by law



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Recycling

- Dominion Energy recycles approximately 700,000 tons of coal combustion byproducts each year.
- A market study was completed to determine the demand for ash for concrete products such as cement, bricks, blocks and pavers.

Recycling

- The report found a number of challenges with the recycling/reuse option:
  - The supply of ash is likely to exceed demand starting in 2019;
  - For three stations, it could take longer to complete than allowed,
  - Prolongs the time to clean-up groundwater and extends the time for water treatment and releases,
  - Would require substantial truck traffic, which could impact the local community, and
  - Recycling is generally more expensive than closure in place because the ash has to be excavated and processed before it can be recycled/reused.

Landfilling

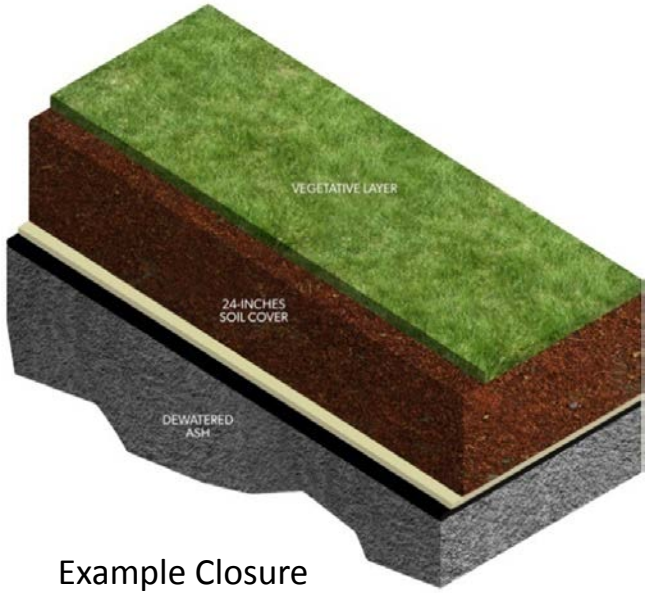
- Involves substantial truck, barge and/or rail traffic, which – again – could impact the local community;
- Prolongs the time to clean-up groundwater and extends the time for water treatment and releases; and
- Is much more expensive than closure in place.

Closure In Place

- The report found that closure in place is by far the most-common option being chosen by utilities across the country for ponds the same size as Dominion's ponds.
  - Nationwide, 92% of the ponds greater than 5 million cubic yards are being closed in place. That is the size of the Upper Ash Pond at Chesterfield and the remaining ash pond, the North Pond, at Bremo.
  - Nationwide, 80% of ash ponds greater than 20 acres are being closed in place. The upper and lower ponds at Chesterfield, the North pond at Bremo and Pond D at Possum point are each greater than 20 acres in size.
- The report also found that the closure in place option can be implemented safely even in severe weather conditions or earthquakes.

Closure In Place

- There are a total of 11 ash ponds at the four Dominion Energy locations included in SB 1398.
- Ash has been or will be removed from 7 of the 11 ponds.
- For Dominion Energy's four remaining ponds at Chesterfield, Bremo and Possum Point stations, the report finds that the option "closure in place with potential groundwater corrective measures" is the "lowest risk for safety, community, schedule and cost."
- Closure in place involves removing water, covering the ash with a synthetic liner, and topping the liner with two feet of soil and grass.
- This method protects groundwater by preventing rainwater from reaching the coal ash.



Example Closure Capping System

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Groundwater

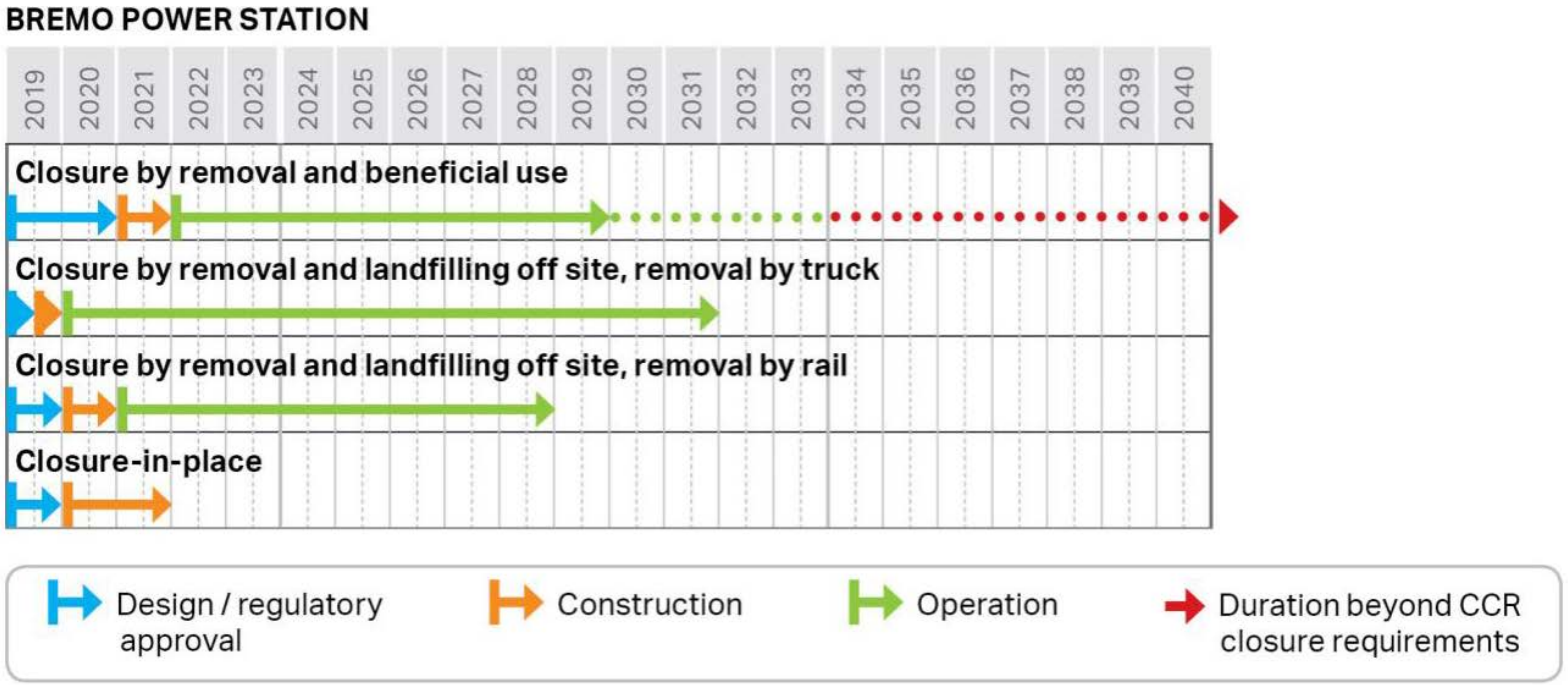
- Groundwater and surface water sampling is in place at all four stations.
- The ash rules prescribe a process and timeframe for evaluating groundwater conditions. We are following that process and timeline.
  - The groundwater results are preliminary and are provided in the report
- Dominion is committed to addressing groundwater conditions at all four stations.
- The report provides options to address groundwater conditions at each station.
- Groundwater conditions are not impacting local drinking water supplies.

What did the report find?

Bremo Power Station

Option	Timeframe	Considerations	Cost
Closure by removal and recycling	11-27 years	Compliance with rule timelines Community, environmental impacts and benefits Market risk Defers final closure	$593M -$1.34B
Landfilling offsite - trucking	13 years	Community, environmental impacts and benefits Defers final closure	$1.03B
Landfilling offsite-rail	10 years	Community, environmental impacts and benefits Defers final closure	$1.53B
Closure in Place with potential corrective action	3-5 years	Can be done safely and in compliance with rules Long term monitoring, potential corrective measures	$98M-173M

Bremo Power Station

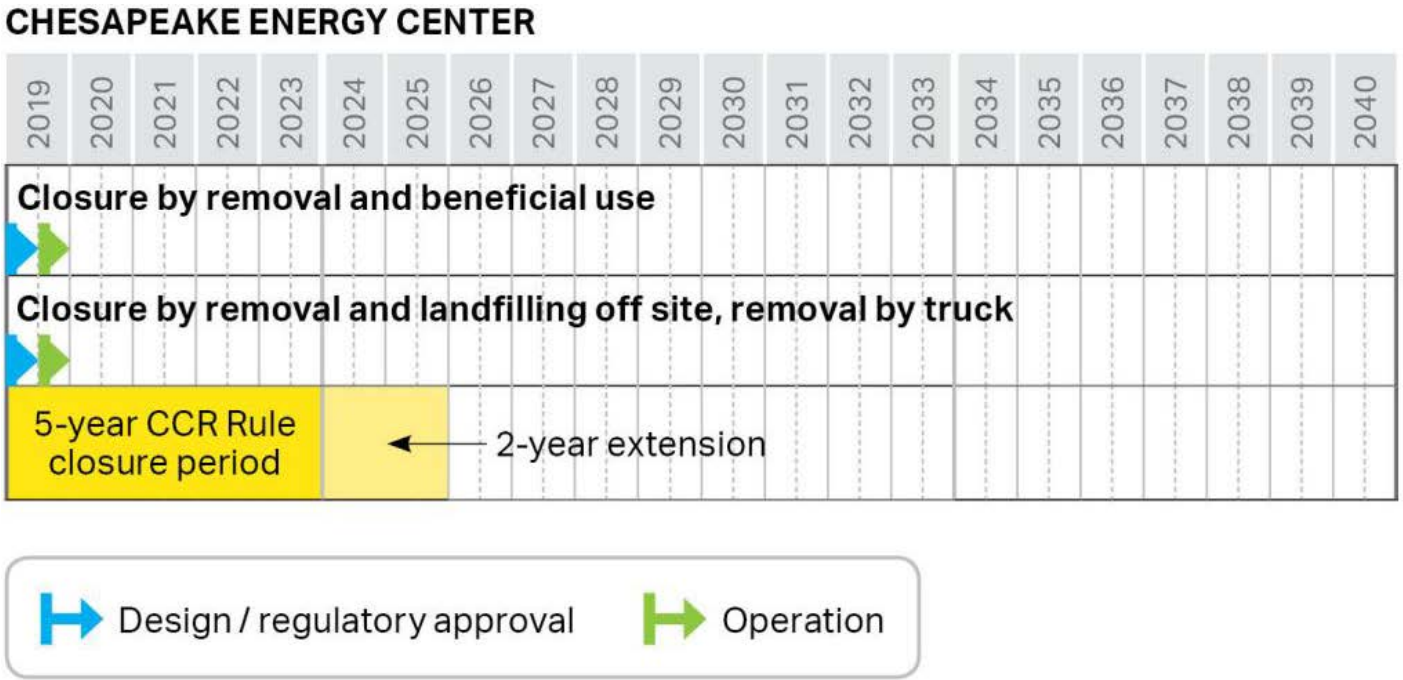


(Note: Solid line represents minimum duration and dotted line represents maximum duration for beneficial use technologies)

Chesapeake Energy Center

Option	Timeframe	Considerations	Cost
Closure by removal and recycling	Up to 1 year	Community impacts from trucking	$10.6M
Landfilling offsite - trucking	2-3 months	Community impacts from trucking	$13.3M

Chesapeake Energy Center



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What did the report find?

Chesterfield Power Station

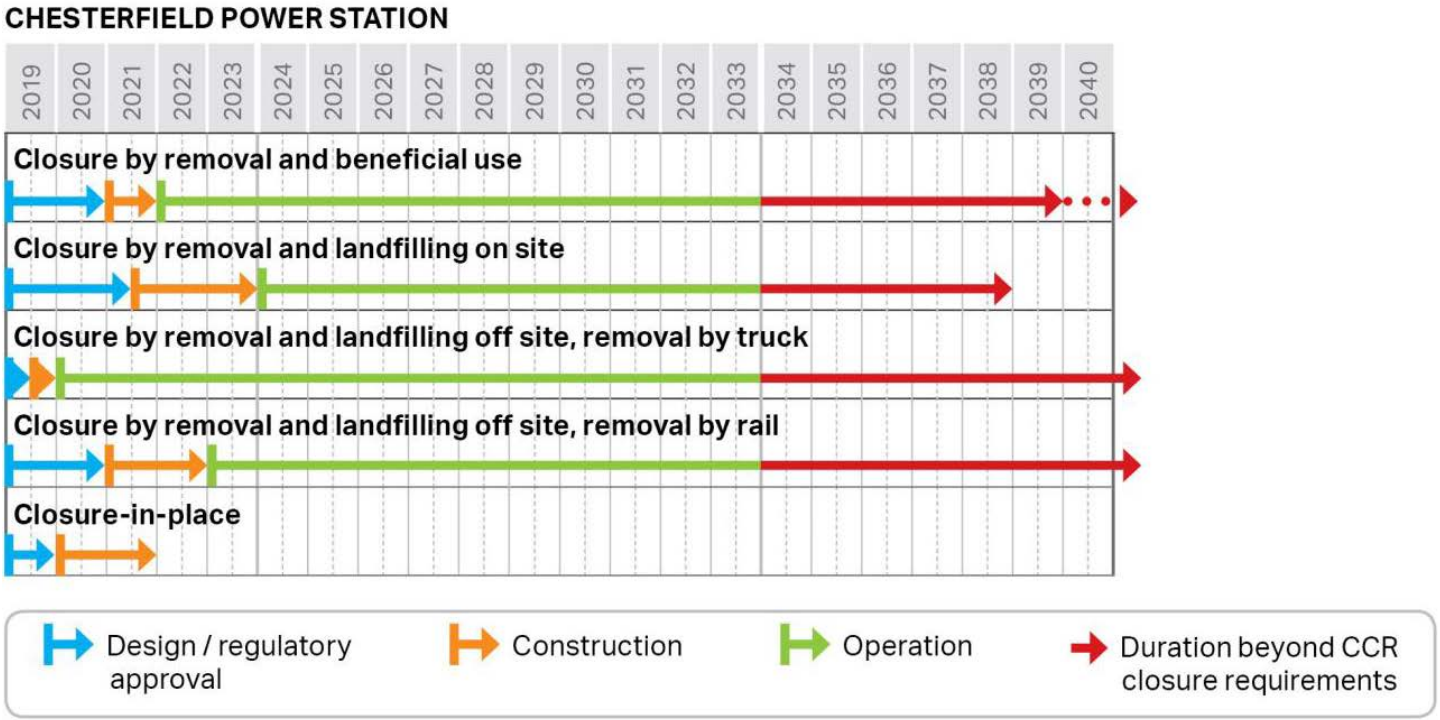
Option	Timeframe	Considerations	Cost
Closure by removal and recycling	21-53 years	Compliance with rule timelines Community, environmental impacts and benefits Market risk Defers final closure	$1.49B -$4.25B
Landfilling offsite - trucking	29 years	Compliance with rule timelines Community, environmental impacts and benefits Defers final closure	$2.68B
Landfilling offsite-rail	24 years	Community, environmental impacts and benefits Defers final closure	$4.63B
Closure in Place with potential corrective action	3-5 years	Can be done safely and in compliance with rules Long term monitoring, potential corrective measures	$246M-1.11B

Dominion Energy

Chesterfield Power Station

Option	Timeframe	Considerations	Cost
Closure by removal and landfilling onsite	20 years	Compliance with rule timelines Community, environmental impacts and benefits Requires local approval and state variance of siting rules Defers final closure	$1.28B
Landfilling offsite - barging		Not a practical alternative	
Regional offsite landfill- Bremo, Chesterfield, Possum Point	21 years	Compliance with rule timelines Community, environmental impacts and benefits Defers final closure	$4.15B

Chesterfield Power Station



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What did the report find?

Possum Point Power Station

Option	Timeframe	Considerations	Cost
Closure by removal and recycling	8-17 years	Compliance with rule timelines Community, environmental impacts and benefits Market risk Defers final closure	$471M-899M
Landfilling offsite -trucking	9 years	Compliance with rule timelines Community, environmental impacts and benefits Defers final closure	$799M
Landfilling offsite-rail	9 years	Community, environmental impacts and benefits Defers final closure	$1.11B
Closure in Place with potential corrective action	3-5 years	Can be done safely and in compliance with rules Long term monitoring, potential corrective measures	$137M-418M

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What did the report find?

Possum Point Power Station

Option	Timeframe	Considerations	Cost
Closure by removal and landfilling onsite	8 years	Community, environmental impacts and benefits Requires local approval and state variance of siting rules Defers final closure	$380M
Landfilling offsite -barging	15 years	Community, environmental impacts and benefits Requires trucking to barge loading and from barge to landfill Defers final closure	$1.7B+

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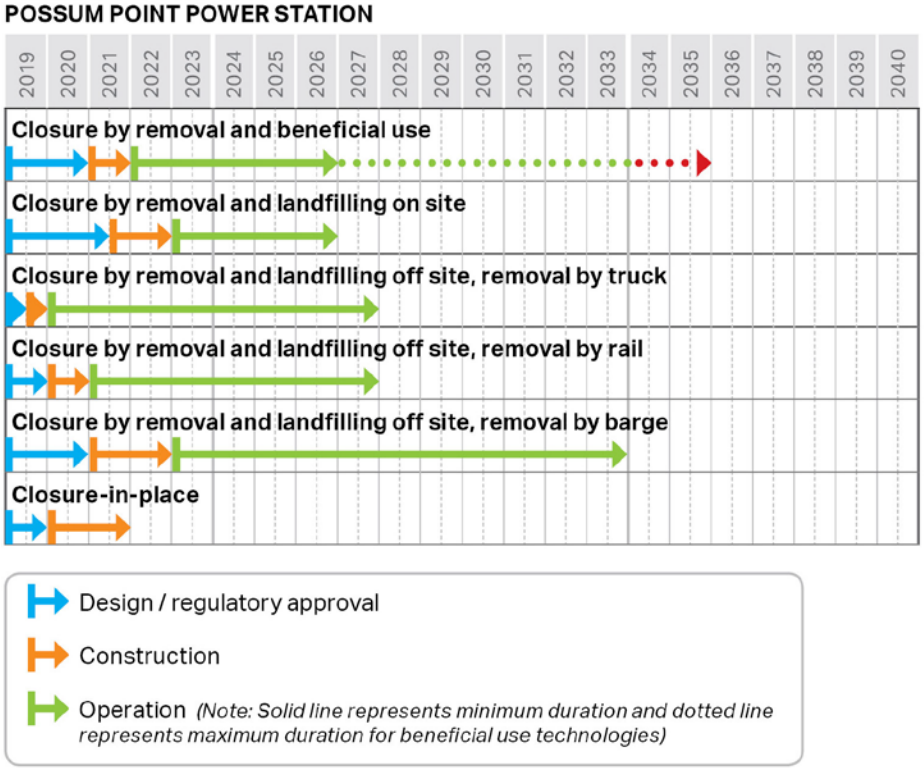
Possum Point Power Station



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Next Steps

- Each ash pond closure requires permits from VA DEQ:
  - Water permits – received for Possum Point, Bremo and Chesterfield
  - Solid waste permits for Possum Point, Bremo, Chesapeake and Chesterfield to be considered by VA DEQ. For Chesapeake, the best option is removal offsite.
  - Stormwater permits and other environmental and local authorizations

Key Steps in State Solid Waste Permitting Process

- ❑ Application Filed by Applicant
- ❑ Review and Consideration of Application
- ❑ Draft Permit Public Noticed
- ❑ Public Hearing
- ❑ Comments Received and Considered
- ❑ Permitting Decision

DEQ
Virginia Department of Environmental Quality

Summary

- Every option evaluated and that was feasible is fully protective of safety, human health and the environment.
- The options vary widely in terms of:
    - their impact on local communities resulting from the closing process;
    - the time it will take to complete the closures; and
    - the potential cost.
    - In some cases, the options may take longer than permitted by law.
- The report finds that closure in place is the lowest risk for safety, community, schedule and cost and that closure in place is by far the most-common option being chosen by utilities across the country for ponds the same size as Dominion’s ponds.
- Closure of the ponds will be subject to permitting by state and local officials.

Questions?