Message

From: Bird, Brian [Brian.Bird@northwestern.com]
Sent: 3/29/2025 7:25:29 PM
To: Szabo, Aaron [Szabo.Aaron@epa.gov]; Goudarzi, Tala [tala.goudarzi@hq.doe.gov]
CC: Dede, Corinne [Corinne.Dede@northwestern.com]; Heim, Shannon [Shannon.Heim@northwestern.com]
Subject: RE: Introduction

Thanks Aaron. Look forward to a discussion this week. We have already filed an exemption for one of our coal plants (Colstrip) and will be filing another for two other plants on Monday.

Appreciate your help!

Brian

Brian B. Bird
President and Chief Executive Officer
3010 W 69th Street I Sioux Falls, SD 57108
Office: (605) 978-2909 I Fax: (605) 978-2905
Email: brian.bird@northwestern.com

Executive Assistant: Corinne Dede
Email: corinne.dede@northwestern.com I Office: (605) 978-2827

NorthWestern Energy
Delivering a Bright Future

From: Szabo, Aaron <Szabo.Aaron@epa.gov>
Sent: Saturday, March 29, 2025 12:39 PM
To: Bird, Brian <Brian.Bird@northwestern.com>; Goudarzi, Tala <tala.goudarzi@hq.doe.gov>
Cc: Dede, Corinne <Corinne.Dede@northwestern.com>; Heim, Shannon <Shannon.Heim@northwestern.com>
Subject: [EXTERNAL] RE: Introduction

Brian,

Let me check with his scheduler to see if that is possible, but I know his week is rather full for next week. If not, I am happy to talk to you about the MATS rule and other air-related issues. As a reminder, you can submit information related to a Presidential Exemption under Section 112 by COB Monday if you have not already (see press release).

Thanks,

Aaron Szabo
Senior Advisor to the Administrator
202-564-7043 (office)
202-855-3241 (mobile)

From: Bird, Brian <Brian.Bird@northwestern.com>
Sent: Friday, March 28, 2025 3:56 PM
To: Goudarzi, Tala <tala.goudarzi@hq.doe.gov>; Szabo, Aaron <Szabo.Aaron@epa.gov>
Cc: Dede, Corinne <Corinne.Dede@northwestern.com>; Heim, Shannon <Shannon.Heim@northwestern.com>
Subject: RE: Introduction

Thanks Tala.

Aaron, I would love 15 minutes with Administrator Zeldin to chat about MATs and the new rules impact on the Colstrip plant in Montana. Anything you can do to make that happen would be much appreciated.

As a bit of a teaser, the new rules requires Colstrip move from 99.6% efficient to 99.8% efficient regarding particulate matter. It appeared to us that rule was changed in order that the owners of Colstrip would be forced to close Colstrip to forego the $500 million baghouse investment necessary to comply with the new rule. Colstrip is necessary to Montana for resource adequacy purposes and to be available when the temperatures are -40 and the wind isn't blowing. It is ludicrous that our customers would have to cover the costs of a $500 million investment for such a slight improvement in particulate matter capture. Anything you can do to help would be much appreciated.

I can make myself available for a call with Mr. Zeldin any time during the week of March 31st.

Thanks, for your consideration,

Brian

Brian B. Bird
President and Chief Executive Officer
3010 W 69th Street I Sioux Falls, SD 57108
Office: (605) 978-2909 I Fax: (605) 978-2905
Email: brian.bird@northwestern.com

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NorthWestern Energy
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From: Goudarzi, Tala <tala.goudarzi@hq.doe.gov>
Sent: Friday, March 28, 2025 2:10 PM
To: szabo.aaron@epa.gov
Cc: Dede, Corinne <Corinne.Dede@northwestern.com>; Bird, Brian <Brian.Bird@northwestern.com>
Subject: [EXTERNAL] Introduction

Aaron,

Please allow me to connect you to Brian Bird, CEO of NorthWestern Energy. If possible, he would love to meet with Administrator Zeldin.

I will let you all take it from here!

Thank you so much and please let me know if I can help in any way.

All the best,

Tala

U.S. DEPARTMENT of ENERGY
follow us on social media

Tala Goudarzi
Principal Deputy Assistant Secretary
Fossil Energy and Carbon Management (FECM)
OFFICE 202.586.6660

Message

From: AirAction [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=FA78B989233840789 95E04A73D258D83-AIRACTION]
Sent: 4/2/2025 11:59:43 AM
To: 'Toomey, Megan A' [Megan.Toomey@talenenergy.com]
CC: 'Paulin, David J' [David.Paulin@talenenergy.com]
Subject: CORRECTION: Updated email address for CBI related to the Presidential Exemption

In the previous email, an incorrect email address was provided for the submission of electronic Confidential Business Information (CBI). The email address should be:

OAQPS_CBI@epa.gov

Thank you.

From: AirAction
Sent: Monday, March 31, 2025 7:48 AM
To: Toomey, Megan A <Megan.Toomey@talenenergy.com>
Cc: Paulin, David J <David.Paulin@talenenergy.com>
Subject: RE: Presidential Exemption: 2024 MATS Rule: Colstrip Steam Electric Station, Units 3 and 4

Thank you for emailing the AirAction mailbox to request a Presidential Exemption under section 112(i)(4) of the Clean Air Act and for engaging with EPA in advancing President Trump's Executive Orders and Powering the Great American Comeback. We have received your email and will be in contact soon. If you have Confidential Business Information (CBI) that you'd like to submit, please submit it in electronic version to the CBI@epa.gov inbox or in hardcopy to:

USEPA, OAQPS
CORE CBI Office
4930 Old Page Road
Durham, NC 27703

From: Toomey, Megan A <Megan.Toomey@talenenergy.com>
Sent: Friday, March 28, 2025 3:45 PM
To: AirAction <AirAction@epa.gov>
Cc: Paulin, David J <David.Paulin@talenenergy.com>
Subject: Presidential Exemption: 2024 MATS Rule: Colstrip Steam Electric Station, Units 3 and 4

> **Caution:** This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Good Afternoon ~

Please find attached the MATS Presidential Exemption request for Colstrip Steam Electric Station, Units 3 and 4.

You may contact me with any questions.

Thanks,

Megan Toomey
Vice President – Environmental Affairs | Talen Energy
Megan.Toomey@TalenEnergy.com
Office: 610.601.0216 | Mobile: 816.872.7752

600 Hamilton Street, Suite 600 | Allentown, PA 18101

TALEN ENERGY

March 28, 2025

To: U.S. Environmental Protection Agency

VIA E-MAIL (AIRACTION@EPA.GOV)

From: Talen Montana, LLC
NorthWestern Corporation d/b/a NorthWestern Energy

Subject: Request for Presidential Exemption from National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review, 89 Fed. Reg. 38508 (May 7, 2024): Colstrip Steam Electric Station, Units 3 and 4

Docket ID No.: EPA-HQ-OAR-2018-0794

I. EXECUTIVE SUMMARY

The emission standard subject to this Request for Presidential Exemption (Request) is the National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review, 89 Fed. Reg. 38508 (May 7, 2024) (2024 MATS Rule, or Rule). The 2024 MATS Rule set an emission limit of 0.010 lb/MMBtu limit for filterable particulate matter (fPM) emissions. *Id.* at 38530; *see also* 40 C.F.R. Pt. 63, Subpt. UUUUU, Tbl. 2 ("On or after July 6, 2027: 1.0E-2 lb/MMBtu").

The affected source is the Colstrip Steam Electric Station, Units 3 and 4, located in Rosebud County, Montana (Colstrip).

Talen Montana, LLC (Talen), the operator and part owner of Colstrip, and NorthWestern Corporation d/b/a NorthWestern Energy (NorthWestern), part owner of Colstrip, jointly request that Colstrip be exempt from the 2024 MATS Rule for two years,[1] running from the later of the Rule's compliance deadline of July 6, 2027, or July 6, 2028, if the State of Montana grants a one-year extension permissible under Section 112 of the CAA.

The President should grant this request under Section 112(i)(4) of the Clean Air Act (CAA) because (1) the technology to implement the standard is not available, and (2) the extension is in the national security interests of the United States.

Technology. The technology to implement the 2024 MATS Rule for Colstrip is "not available" from an engineering, cost, and timing standpoint.

- As applied to Colstrip, the Rule requires an untested and unproven sequencing of emission control technologies. Colstrip already employs wet venturi scrubbers, which presently achieve 99.6% control of fPM. The Biden EPA's 2024 MATS Rule would require control

[1] This two-year exemption may be extended for more than one additional period. 42 U.S.C. § 7412(i)(4).

efficiency to increase from 99.6% to 99.8%, which cannot be achieved by wet venturi scrubber technology. Colstrip would be required to install new fabric filters (also known as baghouses) downstream of the wet venturi scrubbers. This combination is unproven, untested, and raises significant risks to the operation of Colstrip and its ability to timely achieve compliance. For this reason alone, the technology necessary to increase Colstrip's PM control from 99.6% to 99.8% (as required by the 2024 MATS rule) is technologically "unavailable."

- Moreover, based on recent developments in project schedule and costs, a project to install the baghouses would cost over $500 million. These costs are uneconomic, and with respect to NorthWestern, may be unrecoverable, or not fully recoverable in electric rates. Given these costs and technological uncertainty, there is danger that Colstrip would retire instead of installing controls that could cause severe operational issues. As a result, the installation of baghouses is economically "unavailable."

- Additionally, even if Talen Montana and NorthWestern were to take the risk, there is a significant likelihood that the baghouses could not be installed and be operational to meet the compliance requirements until early 2029, far past the statutory deadline. These circumstances make the technology "unavailable" from a timing perspective for Colstrip.

National security. It would be "in the national security interests of the United States" to provide the requested exemption to Colstrip from the 2024 MATS Rule.

- Multiple Executive Orders issued by the President have reaffirmed that removing any and all regulatory burdens restricting power plants' operation would advance various national security interests.

- This is especially the case for Colstrip, a core facility that powers the western part of the United States and is a major economic driver for Montana. Colstrip is critical to grid reliability and resource adequacy, and disruption of operations or the plant's forced retirement in the face of the 2024 MATS Rule would harm the national security interests of the United States because replacement power could not be easily procured in the region. As but one example, reserve power margins are already low (10%, and are projected to worsen) in the western parts of the United States—which house numerous military bases, such as the Malmstrom Air Force Base near Great Falls, Montana. An energy emergency already exists in the western United States, as declared by one of the Executive Orders.

II. BACKGROUND

Section 112 of the CAA regulates hazardous air pollutants such as mercury or non-mercury metals. Power plants are subject to Section 112 only if EPA finds it "appropriate and necessary." 42 U.S.C. § 7412(n)(1)(A). These standards undergo a review every eight years. *Id.* § 7412(f). EPA under the first Trump Administration completed this review and determined that changes to

the existing standards were ***not*** "necessary." 85 Fed. Reg. 31286 (May 22, 2020). EPA under the Biden Administration agreed that the existing standards provide an adequate margin of safety, and further concluded that the Rule will impose far higher costs than quantifiable benefits. Nonetheless, the 2024 MATS Rule required coal-fired power plants to reduce fPM emissions by 66%. 89 Fed. Reg. 38508. Importantly, EPA admitted in the administrative record that almost half of the regulatory burden from the entire 2024 MATS Rule would fall on Colstrip. *Id.*at 38533 ("42 percent"). Talen Montana and NorthWestern encouraged EPA via the formal regulatory comment process to make changes to the Rule to avoid this outcome for Colstrip, their respective Comments included in this Request as Exhibits 1 and 2. Those calls for reasonable change were ignored by the Biden EPA.

Talen Montana and NorthWestern challenged the Rule. *Talen Montana, LLC v. EPA*, No. 24-1190 (D.C. Cir.); *NorthWestern Corp. v. EPA*, No. 24-1217 (D.C. Cir.); *see also North Dakota v. EPA*, No. 24-1119 (D.C. Cir.) (lead case). Talen Montana and NorthWestern requested the court to judicially stay the 2024 MATS Rule, but the court denied the request.

The legal challenges to the 2024 MATS Rule have been held in abeyance in light of the Trump Administration's swift action. But with no judicial stay of the Rule, Colstrip is expected to comply with all emission standards set by the 2024 MATS Rule by July 6, 2027, or one year later if the state provides a statutory extension. Because construction of control technologies takes significant time, power plants such as Colstrip must decide soon whether to make expensive and uncertain investments to comply with the Rule, with no assurance of timely compliance. Colstrip has diligently moved forward with the design of potential control technology, but it has not been able to develop assurance that it can effectively, economically, or in a timely manner comply with the Rule. Meanwhile, the time is soon coming for decisions to be made and expenditures to rise steeply. Moreover, the Colstrip owners face this major investment decision with significant challenges to complying with the Section 111 Greenhouse Gas Rule, 89 Fed. Reg. 39798 (May 9, 2024) (GHG Rule), on the horizon, in just a few short years after the 2024 MATS Rule compliance is due.

On March 12, 2025, EPA published the "Mercury and Air Toxics Standards (MATS): Powering the Great American Comeback Fact Sheet" (Fact Sheet). In this Fact Sheet, the Agency stated that it seeks to reconsider the 2024 MATS Rule. The Fact Sheet and EPA's Press Release issued the same day alerted the public and the regulated community to Section 112(i)(4) of the Clean Air Act (CAA), which allows the President of the United States to grant a compliance exemption of up to two years "if the President determines that the technology to implement such standard is not available and that it is in the national security interests of the United States to do so," 42 U.S.C. § 7412(i)(4). EPA notified the public in the Fact Sheet that any source interested in such exemption from the 2024 MATS Rule "should provide their recommendations to EPA by March 31, 2025." EPA stated that sources only need to provide why the technology is unavailable and why it is in the national security interest for an exemption. EPA's Press Release further explained that the Agency is considering exemptions via CAA Section 112(i)(4) while the Agency goes through the rulemaking process to reconsider the Rule.

III. REQUEST FOR EXEMPTION

In CAA Section 112(i)(4), Congress expressly provided the President ***the discretion*** to determine whether a technology is "not available" and whether exempting a stationary source would be in the "national security interests." In exercising this discretion, the President should consider technological unavailability and national security broadly.

As set forth in the Executive Summary, the control technology for Colstrip to meet the standard is unavailable for the following reasons:

- ***The control technology is technologically unavailable.*** The application of new baghouses following wet venturi scrubbers is unproven and untested and comes with significant risks to the operation of Colstrip.

- ***The control technology is economically unavailable.*** Applying baghouse technology to Colstrip is prohibitively expensive. When the Rule was finalized, Talen Montana estimated the compliance cost to be around $350 million. Currently the cost estimates exceed $500 million, plus operation and maintenance costs of $15 million annually. Market realities, such as difficulties in funding and rate recovery, make such a project uneconomic meaning that it is more likely that Colstrip will shut down.

- ***The control technology is unavailable from a timing standpoint.*** At a minimum, the technology to control emissions to the levels required within the statutory timelines simply does not exist. No control technology could be installed by July 6, 2027, the compliance date set by the 2024 MATS Rule. A significant risk remains that even a one-year extension would not be enough due to the unique financial and technological constraints Colstrip faces.

The President should account for the following in determining that exempting Colstrip from the Rule would advance national security interests.

- At least two Executive Orders have already declared that any emergency suspension of regulations hindering energy production would advance national security. *See* Executive Order 14154 & Executive Order 14156.

- Exempting Colstrip from the Rule falls squarely within advancing national interests because Colstrip is essential in providing much needed, reliable electricity in the western region of the United States, where there is an abundance of critical military infrastructure. Colstrip is also a core economic driver for Montana.

A. The technology to implement the 2024 MATS Rule specifically for Colstrip is unavailable.

Concerning technological availability, CAA Section 112(i)(4) states: "The President may exempt any stationary source from compliance with any standard or limitation under this section for a period of not more than 2 years if the President determines that the technology to implement such standard is not available." 42 U.S.C. § 7412(i)(4). The President should exempt Colstrip pursuant to CAA Section 112(i)(4) because Colstrip does not have a practically available technology to implement the 2024 MATS Rule.

1. Application of baghouses to Colstrip is technologically unproven and untested given Colstrip's existing pollution control technology.

It is true that baghouses, for ***new*** power plants, are widely available because the control technology is installed after the combustion device (the boiler). But in the case of Colstrip, the baghouse must be installed after the already-existing wet venturi scrubbers, which the plant currently uses to control fPM emissions and sulfur dioxide (SO_2). To utilize only a baghouse would require a complete redesign of the facility and likely a new stack, which would be cost prohibitive. The wet venturi scrubbers already capture 99.6% of the fPM, but to capture the remaining 0.2% as required by the 2024 MATS Rule, the baghouses would be needed as an addition to the backend of the wet venturi scrubbers, which would be a unique and unproven combination.

While this arrangement may be theoretically possible, it is challenging and untested in practice. The combination of wet venturi scrubbers followed by baghouses increases the risk that the condensed water droplets (from the scrubbers) would meet the fly ash emitted by the plant, creating particles similar to concrete on the filter bags, thereby crippling the baghouse. Effectively, the combination increases the likelihood that the entire facility gets clogged with concrete particles. Additionally, once the bags are plugged, they must be replaced, and a significant number of plugged bags could result in emission exceedances, the plant being derated, or the plant being forced offline. Talen Montana is unaware of such control technologies ever being applied together in this arrangement at any other facility in the entire United States. As such, there is no proof that such technology is available to capture the small, remaining amount of particulate that exists following the installed wet venturi scrubbers. And because of the short compliance deadline, Colstrip would be required to construct, test, and implement this unprecedented combination on the fly, potentially spending at least $500 million only to have the revamped control system fail. As a result, the technology to comply with the Rule is technologically unavailable.

2. The technology is financially unavailable.

When Talen Montana requested a judicial stay of the 2024 MATS Rule, it submitted a supporting declaration (Lebsack Declaration), included in this request as Exhibit 3.[2] In this declaration, Talen Montana stated that a project to comply with the emission standards would cost "$350 million,"[3] with a "$15 million annually" in operation and maintenance costs. Lebsack Declaration ¶¶ 16, 34. These cost figures already presented challenges to Colstrip, as reflected by the litigation and request for judicial stay.

With the Rule now in effect, Talen Montana has conducted further engineering studies to get a more accurate assessment of the project costs. The most recent, up-to-date engineering estimates exceed $500 million. This new projection accounts for sole source risk allowance, more accurate wage rates, structural steel install rates, scaffolding costs, duct installation costs, and total delivery costs—all of which were not accounted for in studies leading up to the Lebsack Declaration.

These costs will only increase. Because Colstrip cannot handle this project in-house, it must work with a third-party vendor. Colstrip is currently waiting on a turnkey proposal, but it is expected that costs will increase by up to 30%. This is because it will be the vendor that must procure the materials, assume liability, and hire contractors.

Such cost figures are exorbitant and burdensome to the point that it is more likely that some owners of Colstrip will forego installing the control technology altogether, and instead consider shutting down the plant. At least three market conditions cause the installation of baghouses to be financially unavailable.

First, a significant number of Colstrip's co-owners might not be interested in funding such a project. As explained in the Lebsack Declaration, some of Colstrip's co-owners are located in the Pacific Northwest. And because of shifting political sentiments against coal in the region, these co-owners would not be interested in any involvement that would allow a coal-fired power plant to continue operating. For example, the public utility commissions in Oregon and Washington do not want any electricity powered by coal. In fact, the State of Washington passed a statute that would impose ***penalties*** on utilities that provide coal-fired electricity to certain Washington customers after December 31, 2025. Wash. Rev. Code §§ 19.405.030(1)(a), (4) and 19.405.090(1)(a)(i). With express disapprovals from Pacific Northwest utility commissions, it

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[2] Of note, even opponents to the judicial stay carefully tailored their argument and implicitly recognized Colstrip's unique constraints and challenges. They claimed that any judicial stay in favor of Colstrip should not be extended to others. *See, e.g.*, EPA Opp'n 50, *Talen Montana, LLC v. EPA* (D.C. Cir. filed July 22, 2024), ECF No. 2065849; Env't Intervenors Opp'n 13 (D.C. Cir. filed July 22, 2024), ECF No. 2065869.

[3] The Lebsack Declaration includes an "Attachment A," which provides select excerpts from a report prepared by technical consultants that assessed the cost breakdown. Table 1-1 of Attachment A (located in page 1-9) provides a summary of the cost breakdown.

would be difficult for these co-owners to justify any project that would let Colstrip to continue operate. Lebsack Declaration 9 10.

Second, it is possible that public utility commissions disapprove rate recovery for the project. This is exactly the conundrum NorthWestern currently faces as a regulated utility. In the comments submitted during the rulemaking period for the 2024 MATS Rule, NorthWestern expressly flagged this scenario as a grave area of concern. NorthWestern already planned on investing over $2.4 billion in electricity infrastructure improvements, which has spurred significant rate recovery controversy. When NorthWestern filed its comments, the Montana Public Service Commission was weighing a 28% residential electricity rate settlement that did not account for the 2024 MATS Rule. NorthWestern Comments 20 21. The Commission largely approved the settlement, allowing NorthWestern to recover for its past investments. However, to maintain the utility's health, NorthWestern filed another rate review in Summer 2024, seeking recovery of essential investments made through December 2024 to serve customers. There has been no final decision, and that filing presents no costs directly attributable to the construction of a baghouse itself.

Third, the future of EPA's GHG Rule further complicates the feasibility of such a project that the 2024 MATS Rule demands. While the Trump Administration has expressed intent to reconsider and possibly rescind the GHG Rule, it is still on the books. And as expressed by Talen Montana and NorthWestern, under this rule, Colstrip has no option but to shut down the plant by 2031. Lebsack Declaration ¶¶ 41–43.[4] This is because Colstrip cannot switch to burning natural gas instead of coal as required by the GHG Rule. Nor could Colstrip switch to natural gas to comply with the 2024 MATS Rule. *See id.* If the GHG Rule forces Colstrip to shut down, Colstrip's cost-recovery period for any technology installment would greatly decrease. While it is true that this particular concern may not materialize, it is still a financial uncertainty and a material factor that any investor must consider when deciding to commit to a project.

3. The technology is not available by July 6, 2027, and there is a significant risk that a one-year extension would be insufficient.

The 2024 MATS Rule directs all applicable facilities to comply with the new emission standard by July 6, 2027. *See, e.g.*, 40 C.F.R. § 63.9991 ("Before July 6, 2027, you must meet each operating limit in . . . this subpart . . . ."); 89 Fed. Reg. at 38508 (setting the effective date of the 2024 MATS Rule to be "July 8, 2024"); 42 U.S.C. § 7412(i)(3)(A) (directing EPA to "establish a compliance date . . . in no event later than 3 years after the effective date of such standard"). This deadline could be extended by one year by a permitting authority. 42 U.S.C. § 7412(i)(3)(B). Colstrip cannot meet the fPM emission standard of 0.010 lb/MMBtu unless it installs baghouses, a major infrastructure addition to the facility.

[4] The Lebsack Declaration includes an "Attachment B," which is a separate declaration in support of judicially staying the GHG Rule. *See West Virginia v. EPA*, No. 24-1120 (D.C. Cir.).

Meeting the July 6, 2027 compliance timeline always has been ambitious, if not impossible. Such a project, at an absolute minimum, would take 36 to 42 months to complete. Construction alone would take two years because the first year would be devoted solely to foundation work. The time necessary for preliminary investigation and design finalization prior to construction would add an additional two and a half years. This timeline tracks Colstrip's experience—the facility's engineers had commenced preliminary investigation on May 1, 2023, and only around now is the plant moving onto the design phase, projected to last another year.

When requesting a judicial stay of the 2024 MATS Rule, Talen Montana explained how the only way to meet the Rule's deadline is if detailed engineering and design work begin in the fall of 2024, and construction commences in the spring of 2025. "[E]ven if the project could begin in the fall of 2024, it will be a challenge to complete by the compliance deadline of July 8, 2027, and may still be tight for a compliance even if granted a one-year deadline extension under the rule." Lebsack Declaration ¶ 37.

These have always been best-case projections with zero margin of error. Multiple complications could delay the project. Due to its location in Montana, any construction project for Colstrip is subject to weather extremes. Cold temperature often makes concrete pouring impossible. Staff would be unable to work for an extended period once temperatures fall to 30 degrees or below or once it snows extensively.

Labor availability is also an issue. The closest "large" city is Billings, Montana, 100 miles away. It is challenging to provide temporary lodging for all workers involved in a project of this scope. In fact, skilled labor in this specific field (of installing baghouses) is limited due to the fact that most projects of this kind occurred in 2012 (when the original MATS rule was promulgated), and specialists have either retired or moved on to work on other projects. Even if labor could be procured, it will be difficult to staff personnel in both the baghouse construction project and normal plant maintenance activities. Inherent tradeoffs must be made where allocating boilermakers to the baghouse could cause labor shortage in the normal operation of the plant.

Lastly, inherent supply chain uncertainty lingers. The project requires significant amounts of steel and electrical components (such as transformers, motors, and switch gear). All of these are imported, and procurement is becoming challenging due to market conditions.

And while Talen Montana has been diligent in its efforts to ensure Colstrip's compliance with the Rule, complications have pushed back these timelines. As discussed *supra* pages 6 7, there are significant challenges funding a project of such magnitude where the project has the potential to create severe technological complications and sufficient time does not exist to recover costs (due to the Biden EPA's GHG Rule). Additionally, because the co-owners hold divergent opinions on whether such funding is justified in the first place, any agreement would likely come in January 2026 at the earliest (after certain anticipated ownership changes). Colstrip's engineers project that, as soon as funding is available the first day of 2026, the entire project could potentially be completed by Spring of 2029. That still misses the compliance deadline even if the Montana

Department of Environmental Quality grants a one-year extension that is the maximum extension allowable under law. As a result, the project is unavailable within the regulatory timeframe.

B. It is in the "national security interests of the United States" to exempt Colstrip from compliance with the 2024 MATS Rule.

The statute requires the President to determine that exempting Colstrip from the 2024 MATS Rule "is in the national security interests of the United States." 42 U.S.C. § 7412(i)(4).

As a threshold matter, Presidential determinations on national security receive the utmost deference. "[T]he Supreme Court has always been reluctant to second-guess the Executive Branch on matters of national security—especially where Congress has not acted to restrict it." *Lee v. Garland*, 120 F.4th 880, 889 (D.C. Cir. 2024); *see also Haig v. Agee*, 453 U.S. 280, 291 (1981) ("[I]n the areas of . . . national security, . . . congressional silence is not to be equated with congressional disapproval."); *United States v. Curtiss-Wright Exp. Corp.*, 299 U.S. 304, 320 (1936) (discussing "the very delicate, plenary and exclusive power of the President as the sole organ of the federal government in the field of international relations").[5]

And the President has spoken. Through Executive Order 14156, the President declared a "national energy emergency" concerning energy resources and costs. 90 Fed. Reg. 8433 (Jan. 29, 2025) ("Declaring a National Energy Emergency"). According to the President, "a reliable, diversified, and affordable supply of energy" is necessary for the nation's "defense industries" and "military preparedness." *Id.* Further, "an affordable and reliable domestic supply of energy is a fundamental requirement for the national and economic security of any nation," especially when "hostile state and non-state foreign actors have targeted our domestic energy infrastructure, [and] weaponized our reliance on foreign energy." *Id.*

The national security implications of reliable, unrestrained energy production echoes in Executive Order 14154 as well. 90 Fed. Reg. 8353 (Jan. 29, 2025) ("Unleashing American Energy"). Through this Executive Order, the President determined that various regulations have impeded resource development, "limited the generation of reliable and affordable electricity," and inflicted high energy costs, all of which "weaken[s] our national security." *Id.* Thus, the President determined that it is "in the national interest to unleash America's affordable and reliable energy and natural resources" which, in turn, will "rebuild our Nation's economic and military security." *Id.*

As such, the President directed all agencies to "exercise any lawful emergency authorities" to facilitate "production, transportation, refining, and generation of domestic energy resources," including "in and through the West Coast of the United States." 90 Fed. Reg. at 8434. Likewise, the President directed all agencies to "suspend, revise, or rescind" all regulations that "impose an

[5] Because CAA Section 112(i)(4) is fundamentally concerned with national security, this same high level of discretion must be afforded to Presidential determinations on all elements of the Section, including determinations that a particular control technology is "not available."

undue burden" on the use of coal as "expeditiously as possible" in the interest of national security. *See* 90 Fed. Reg. at 8353 54 (discussing the Executive Order's policy goals of "reduc[ing] the global influence of malign and adversarial states," and "protect[ing] the United States's economic and national security and military preparedness by ensuring . . . an abundant supply of reliable energy").

The slew of passages in the Executive Orders make clear: The President has already determined that ***any*** reduction of regulatory burden when it comes to energy production including an emergency exemption of the 2024 MATS Rule for any power plant—would be in the national security interest. This is unsurprising. Coal still supplies 16% of America's electricity. U.S. Energy Information Administration, *What is U.S. electricity generation by energy source?* (Feb. 2024).[6] This share is especially important because coal provides efficient, low-cost, reliable 24/7 baseload power. In doing so, it stabilizes electrical grids under increasing threats. Moreover, the United States has abundant coal reserves, providing a secure and reliable supply, and generating domestic jobs and economic activity.

The continued operation of Colstrip fits comfortably into President Trump's directives, as evinced by the Executive Orders discussed. Therefore, specifically exempting Colstrip from the 2024 MATS Rule would be in the national security interests of the United States.

As Talen Montana submitted in its comments to EPA when the 2024 MATS Rule was proposed, "Colstrip is one of Montana's most important energy assets, especially as demand for reliable baseload power in the western U.S. continues to grow." Talen Montana Comments 7. Colstrip "is vital to ensuring that Montanans have affordable and reliability electricity, especially during peak winter and summer months." *Id.*

NorthWestern, the largest public utility in Montana, also extensively commented on Colstrip's importance to the grid. In the lawsuit challenging the Rule and as part of the request for a judicial stay, NorthWestern submitted a declaration as well (Hines Declaration), included in this recommendation as Exhibit 4. Both these documents flag the importance of Colstrip to the nation's grid and electricity supply, and how the 2024 MATS Rule hinders national security by disrupting Colstrip's operations.

- The 2024 MATS Rule will increase electricity rates for Montana ratepayers. Hines Declaration 7 10; NorthWestern Comments 21. In fact, the diversion of funds alone for compliance with the Rule would complicate meeting generation demand. NorthWestern Comments 2–3.

- Replacement electrical generation and transmission capacity does not exist for Colstrip. In other words, Colstrip is truly irreplaceable from an electricity production standpoint, at

[6] Available at https://www.eia.gov/tools/faqs/faq.php?id=427&t=3.

least in the near future. Hines Declaration ¶¶ 45–52; NorthWestern Comments 13–16 ("Transmission limitations on the ability to import power").

- "Colstrip plays a critical voltage-maintenance function." Hines Declaration ¶ 65. Without Colstrip and its uninterrupted operation, there is a significant blackout risks which would affect businesses and "important infrastructure." *Id.* ¶¶ 66, 67. This is especially the case because NorthWestern, as a regulated utility, made targeted capital investments improving grid reliability, which had not planned for the 2024 MATS Rule and its costs. NorthWestern Comments 21–22.

The economic consequences of grid disruptions are severe and well-documented, and they pose a national security concern in and of themselves. If Colstrip is forced to reduce or cease operations because it cannot timely comply with the 2024 MATS Rule, there would be an increased risk of the kinds of devastating disruptions that have recently hit California and Texas. Hines Declaration ¶¶ 52, 64 67. All these issues warrant heightened attention when considering military readiness. Colstrip powers the northwestern region generally, including the military bases located in the area. The State of Washington alone is home to nine known military bases. And Oregon, Montana, and Idaho collectively house seven more. Any risk to power disruption in and around these bases affect core national security issues.

External sources confirm Talen Montana and NorthWestern's grid reliability concerns. The Western Power Pool projects that for July to August, the planning reserve margin falls below 10% for most of 2026 to 2029. The North American Electric Reliability Corporation (NERC) projects that reserve margins reach levels of 10% or below ***overall*** starting in 2031. NERC, *2024 Long Term Reliability Assessment* 127 (Dec. 2024).[7]

Lastly, Colstrip is also vital to protecting "economic security" as expressed in the two Executive Orders discussed above. *See* 90 Fed. Reg. at 8433; 90 Fed. Reg. at 8353. Colstrip supports more than 3,000 jobs in the local economy, provides $240.3 million in income for Montana households, and about $102.8 million in state tax revenue to Montana. Indeed, it has been calculated that Montana benefits in economic activity worth over $1 billion from Colstrip in the form of electricity costs and reliability, inter-region trade, and lower state government spending. Lebsack Declaration ¶ 58 (including Attachment C);[8] Talen Montana Comments 6 7.

[7] Available at https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC Long%20Term%20Reliability%20Assessment 2024.pdf.

[8] The Lebsack Declaration includes an "Attachment C," which is a study of Colstrip's economic contributions prepared by Dr. Patrick M. Barkey, Ph.D.

IV. CONCLUSION

Talen Montana and NorthWestern appreciate the opportunity to submit its request to exempt Colstrip from the 2024 MATS Rule. Talen Montana and NorthWestern respectfully request that the President exercise his discretion to exempt Colstrip from the 2024 MATS Rule.

Respectfully submitted,

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Enclosures:

- Exhibit 1 Talen Montana Comments
- Exhibit 2 – NorthWestern Comments
- Exhibit 3 Lebsack Declaration (including Attachments A to C)
- Exhibit 4 – Hines Declaration

Exhibit 1

Talen Montana Comments

TALEN MONTANA

COMMENTS OF TALEN MONTANA, LLC ON THE PROPOSAL ON NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: COAL- AND OIL-FIRED ELECTRIC UTILITY STEAM GENERATING UNITS REVIEW OF THE RESIDUAL RISK AND TECHNOLOGY REVIEW

Docket ID: EPA-HQ-OAR-2018-0794

I. INTRODUCTION

On April 24, 2023, EPA published in the *Federal Register*, at 88 Fed. Reg. 24,854, a Proposal that would amend the National Emission Standards for Hazardous Air Pollutants ("NESHAP") for coal- and oil-fired electric utility steam generating units ("EGUs") — *i.e.*, the Mercury and Air Toxics Standards ("MATS") ("Proposal" or "Proposed Rule"). Among other amendments, EPA is proposing to: (i) tighten the surrogate filterable particulate matter ("fPM") standard for demonstrating compliance with the emissions limits for non-mercury ("non-Hg") metal hazardous air pollutants ("HAPs") from 0.03 lb/MMBtu to 0.010 lb/MMBtu; and (ii) require continuous emissions monitoring systems ("CEMS") for demonstrating compliance with the fPM standard.[1]

Talen Montana, LLC ("Talen Montana") is part-owner and operator of Units 3&4 of the Colstrip Steam Electric Station ("Colstrip") in Rosebud County, Montana. On behalf of itself as an owner and with knowledge gained as the operator of Colstrip, Talen Montana has significant concerns about the Proposed Rule, particularly with the proposed tightening of the fPM standard. These concerns stem from the unique design and circumstances of Colstrip. Colstrip currently uses venturi wet scrubbers to address both sulfur dioxide ("SO_2") and fPM emissions. It would be extremely expensive — and potentially cost prohibitive — for Colstrip to comply with the 0.010 lb/MMBtu fPM limit because the venturi wet scrubbers cannot meet that limit. Colstrip would need to undertake a massive and complex construction project to install new controls — either new fabric filters ("FFs") or electrostatic precipitators ("ESPs") — when Colstrip's remaining life and future generation is likely limited given EPA's other rulemakings targeting older sources like Colstrip. The high costs associated with installing, testing, and implementing new controls, coupled with limited time and electric generation for the recovery of such costs, may cause Colstrip to shut down prematurely if the owners deem that it is not economically feasible to install the necessary controls to comply with the proposed fPM standard.

A premature shutdown of Colstrip would have significant economic impacts on Montana and beyond and raises serious concerns about grid reliability and transmission, factors that were not considered by EPA in setting the proposed fPM standard. Moreover, Colstrip bears a hugely disproportionate burden under the Proposed Rule, especially where EPA has not found any unacceptable risk related to Colstrip's (or any other affected facility's) operation under the current fPM standard. Indeed, by EPA's own calculations, Colstrip is expected to bear almost 50 percent

[1] *See* 88 Fed. Reg. 24,854 (Apr. 24, 2023).

of the costs of the Proposed Rule. For these reasons, as well as other legal and technical reasons discussed below, Talen Montana asks that EPA not finalize the proposed 0.010 lb/MMBtu fPM limit. However, should EPA ultimately finalize the proposed 0.010 lb/MMBtu fPM limit, Talen strongly urges EPA to establish a subcategory for coal-fired units that use wet scrubbers to address both SO_2 and PM emissions and that do not presently have an ESP or FF, where the fPM limit for those units is no lower than 0.025 lb/MMBtu fPM. Given that EPA's rationale for the Proposed Rule is that existing control technology is more effective and cost effective than was known at the time of the original MATS rule, a targeted limit that is specific to the existing wet scrubber technology is consistent and appropriate with that approach.

As an additional alternative, Talen Montana requests that EPA establish a subcategory for near-term existing coal units electing to retire where the fPM limit remains at 0.030 lb/MMBtu until ceasing operations. This would be consistent with the approach EPA has taken in other rulemakings. Under such an approach, units could opt-in to the subcategory by making an enforceable retirement commitment within a specified timeline after the Proposed Rule is finalized and with retirement planned by a specified date. For this subcategory, Talen Montana proposes that units opt-in within 18 months after the effective date of the final rule with a retirement date no later than December 31, 2035 (with a "safety valve" that would allow longer operation depending on circumstances in the future, as described below).

II. BACKGROUND

Colstrip is one of the largest coal-fired electric generating facilities west of the Mississippi River, supplying electricity throughout Montana and the Pacific Northwest. Talen Montana has a 15% ownership stake in Colstrip, which currently consists of two active coal-fired generating units capable of producing up to 1,480 MW of electricity that have been operating for approximately 37 years. Each of the units has approximately 740 MW of generating capacity, and the adjacent Rosebud coal mine supplies Colstrip's low-sulfur subbituminous coal.

A. Colstrip's Unique Design

Colstrip's design sets it apart from other coal-fired units in the country that are currently operating. Colstrip began construction in the 1970s and Units 3 and 4 began operations in the 1980s. Colstrip was designed to utilize low-sulfur coal and with then state-of-the-art venturi wet scrubbers to reduce its SO_2 emissions below the applicable limits. Colstrip also relies on the venturi wet scrubbers to mitigate fPM.

Colstrip has eight wet venturi scrubbers on each of unit. Seven scrubbers are used during normal full load operation and one scrubber is a "backup," used only when one of the other seven scrubbers in operation needs to be removed from service or is undergoing routine cleaning and maintenance. Below is a diagram of the wet venturi scrubber used at Colstrip Units 3&4:

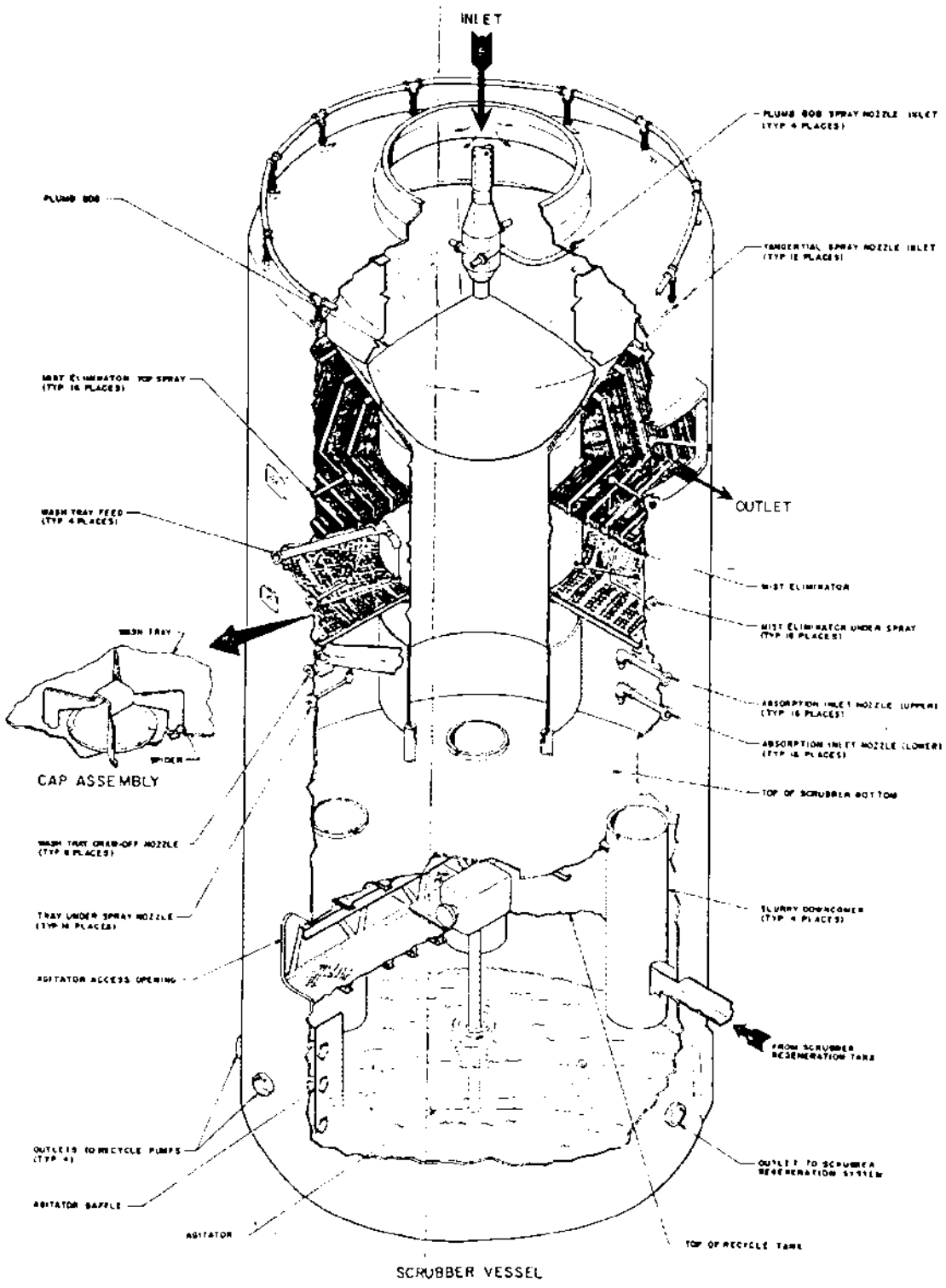

Figure 1 - Diagram of Colstrip Scrubber

The venturi wet scrubbers at Colstrip Units 3 and 4 remove approximately 99.7% of fly ash particulate from the flue gas and 95% of the SO2 via a sequence of removal processes. The flue gas enters the scrubber vessel and is accelerated by the converging surfaces of the plumb bob and venturi bowl. The flue gas and slurry meet in the venturi throat where turbulence atomizes the slurry. Acceleration of the flue gas causes the particulate to collide with and be absorbed by slurry droplets. The majority of the fly ash particulate and most of the SO_2 are removed in the venturi section. The wet venturi scrubbers utilize the alkalinity of the fly ash particle removed to help meet the high level of SO_2 removal. The throat area of the venturi is adjusted by moving the plumb bob up or down to obtain the desired pressure drop across the plumb bob of each scrubber. The flue gas velocity caused by this pressure drop ensures optimum fly ash removal. The slurry and collected fly ash are separated from the flue gas as it turns up to enter the absorption area. The flue gas then enters the absorption spray area in the annular space between the downcomer and shell of the scrubber vessel. The flue gas is contacted with recycle slurry for additional removal of SO_2. Above the absorption section is the wash tray which uses recirculation water to contact the flue gas and remove entrained recycle slurry from the flue gas. The flue gas then flows through the mist eliminator where entrained droplets are removed.

As EPA recognized, Colstrip does not have a FF or an ESP and would need to install one to comply with the proposed 0.010 lb/MMBtu fPM limit, as the current venturi wet scrubbers will not be able to meet the proposed limit.[2] While EPA recognizes that Colstrip's venturi wet scrubbers would not be able to comply with the proposed limit, EPA assumes Colstrip could make a "minimal cost ($10/kW) for [wet scrubber] maintenance or minor upgrades . . . to meet a potential 0.015 lb/MMBtu standard."[3] This assumption, however, is inaccurate. Colstrip has typically been able to remain just below the current limit of 0.030 lb/MMBtu. However, due to occasional variability in fuel and operating condition, Colstrip has, since 2018, hired consultants and engineers to explore ways to further enhance the efficiencies of the venturi wet scrubbers. This work, as described below, has made the venturi wet scrubber emissions more stable. But, as reflected in Attachment A (Colstrip's MATS PM CEMS compliance data from September 2018 to April 2023), the work demonstrated that 0.015 lb/MMBtu fPM is not achievable with upgrades to the existing wet scrubbers and further that the efforts to reduce fPM emissions with the existing control technology has reached its limits:

- The original operating condition for the plumb bob delta P (pressure drop) was 17" to meet particulate and SO2 removal requirements. In an effort to optimize the performance of the scrubbers, the plumb bob delta P is currently operated at 27-28", the maximum delta P achievable which is limited by the capability of the induced draft ("ID") Fans.

- The original mist eliminators have been upgraded with improved performance to better control entrained droplets in the flue gas. In 2018, the mist eliminator supplier (Munters)

[2] *See* 2023 Technology Review for the Coal- and Oil-Fired EGU Source Category ("Technical Memo"), Doc. ID. EPA-HQ-OAR-2018-0794-5789, at PDF p. 9, posted Apr. 24, 2023.
[3] *See id.*

conducted a mist eliminator performance test, and the results showed dry conditions with very little or any droplet carry over.

- Scrubber slurry solids level has been controlled to 25-30% solids to minimize potential particulate contribution from entrained droplets in the flue gas.

- Flow distribution plates have been installed on each scrubber to improve the flow balance across the scrubber, provide a more uniform flow, and improve particulate removal performance.

Colstrip also implemented additional measures to address combustion conditions to help ensure that combustion of the coal occurs in a manner that prevents to formation of small fly ash particles that are difficult to remove in the wet venturi scrubbers, including:

- Combustion tuning and incorporation of optimum conditions over variable operating conditions into the Combustion Optimizer System.

- Optimization of the furnace sootblower system to ensure optimum heat transfer in the furnace and prevent elevated temperatures in the upper part of the furnace that can contribute to formation of small particulate particles that are difficult to remove in the wet venturi scrubbers.

- Optimization of coal mill fineness by regularly performing coal mill sieve analysis to ensure correct particle size distribution of the coal entering the furnace.

Together, these comprehensive efforts reflect all known upgrades available to be implemented to the Colstrip scrubber/combustion process to reduce fPM, which enables Colstrip to achieve compliance with the current 0.030 lb/MMBtu fPM limit with an adequate compliance margin. While the majority of stack testing has shown emission rates between 0.020 lb/MMBtu and 0.025 lb/MMBtu fPM, there have been several instances where stack tests were above 0.025 lb/MMBtu fPM.[4] In 2022, based on stack tests, the two units combined achieved approximately 0.022 lb/MMBtu fPM on an annual basis.

With the extensive scrubber/combustion process reviews by consultants and engineers and implementation of the upgrades previously identified, Talen Montana believes that these efforts have optimized the current control technology to the maximum extent feasible. While Colstrip remains dedicated to continued optimization to control fPM, Colstrip cannot meet a the more stringent fPM limits in the Proposed Rule (either the 0.015 lb/MMBtu or the proposed 0.010 lb/MMBtu) without installation of a FF or ESP, which as noted previously would be a massive, complex, and expensive construction project.

[4] *See* Attachment A.

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B. Colstrip's Unique Circumstances

Despite the importance of Colstrip to Montana and the surrounding region, Colstrip's future is uncertain. Colstrip's remaining life and future generation may be limited by the Inflation Reduction Act ("IRA"), which EPA's IPM runs suggest will cause Colstrip to significantly reduce generation as more renewables come online and other EPA rulemakings targeting older sources such as Colstrip are implemented. These rulemakings, excluding forthcoming ones, impacting Colstrip include: (i) the proposed rule on the Hazardous Solid Waste Management System: Disposal of Coal Combustion Residuals ("CCR") from Electric Utilities; Legacy CCR Surface Impoundments (88 Fed. Reg. 31,982 (May 18, 2023)) ("Proposed CCR Rule"); and (ii) the proposed rule on New Source Performance Standards for Greenhouse Gas ("GHG") Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired EGUs; Emission Guidelines for GHG Emissions from Existing Fossil Fuel-Fired EGUs; and Repeal of the Affordable Clean Energy Rule (88 Fed. Reg. 33,240 (May 23, 2023)) ("Proposed GHG Rule").

The costs associated with complying with the proposed fPM limit, compounded with the proposed requirements in these other rulemakings, are massive. Given the reduced lifespan and generation that may be on the horizon for Colstrip, it will be extremely difficult to justify installing new controls to meet such the fPM limit in the Proposed Rule. At a certain point, it is likely that the owners will determine that it is no longer economically feasible to continue operating Colstrip, as they will not be able to recoup the cost of installing controls.

Furthermore, any closure plans necessitate intensive engagement and coordination among stakeholders because Colstrip is vital to Montana and the surrounding region. As concluded in a 2017 study by University of Montana's Bureau of Business and Economic Research, "[t]he early retirement of Colstrip Units 3 and 4 would ultimately produce:

- [A]n economy with, on average, almost 3,300 fewer jobs than would have been present if the units continued to operate through the 2028-43 period[.]
- [A] loss of income received by Montana households varying between $250 and $350 million per year, adding up to a total of about $5.2 billion over the full 16-year period 2028-43. Losses in after-tax income . . . for Montana households would total almost $4.6 billion over the same period.
- [D]eclines in annual gross sales by businesses and other organization, or economic output, between $700 and $800 million, cumulating to $12.5 billion over the full sixteen period.

- [A] decline in population which occurs as works and families migrate to other economic opportunities, growing to more than 7,000 people by year 2043."[5]

Colstrip also is vital to ensuring that Montanans have affordable and reliability electricity, especially during peak winter and summer months. Colstrip is one of Montana's most important energy assets, especially as demand for reliable baseload power in the western U.S. continues to grow. As Montana state Governor Gianforte has recognized, Montana needs Colstrip.[6]

Thus, EPA's proposal to make the fPM limit more stringent, as well as require CEMS to demonstrate compliance with that limit, has far-reaching ramifications given Colstrip's unique design and circumstances. Talen Montana strongly recommends that EPA reconsider its proposed amendments or to provide the relief requested by Talen Montana herein.

III. COMMENTS

Talen Montana understands that EPA conducted the MATS Residual Risk and Technology Review ("RTR") pursuant to President Biden's Executive Order 13990.[7] The order required EPA to review certain actions undertaken by the prior administration, including the MATS RTR finalized in May 2020.[8] The 2020 MATS RTR indicated that HAP emissions from the source category are acceptable and also did not identify any cost-effective controls that would achieve further HAP emission reductions.[9] While EPA acknowledges in the Proposal that the 2020 Residual Risk Review was sound and is not proposing to modify it, EPA is proposing to determine that the 2020 Technology Review was flawed because it "did not consider developments in the cost and effectiveness of . . . proven technologies, nor did EPA evaluate the current performance of emission reduction control equipment and strategies at existing MATS-affected EGUs."[10] Following the consideration of such factors, EPA is proposing that the updated technology review requires certain changes to MATS.[11] These changes include the fPM limit and the use of PM CEMS.[12]

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[5] Barkey, Patrick M. "The Economic Impact of the Early Retirement of Colstrip Units 3 and 4 Final Report," June 2018 at 6.

[6] "Governor Gianforte: 'Montana Needs Colstrip,'" State of Montana Newsroom, Jan. 17, 2023, https://news.mt.gov/Governors-Office/Governor_Gianforte_Montana_Needs_Colstrip.

[7] 88 Fed. Reg. at 24,856.

[8] *See* National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units-Reconsideration of Supplemental Finding and Residual Risk and Technology Review, 85 Fed. Reg. 31,286 (May 22, 2020).

[9] *See id.*

[10] 88 Fed. Reg. at 24,865.

[11] *See id.* at 24,856.

[12] *See id.* at 24,857-58.

TALEN MONTANA

A. EPA Has Not Established a Sufficient Basis for Tightening the fPM Limit.

Existing coal-fired EGUs currently can demonstrate compliance with the emission limits for non-Hg metal HAPs by meeting: (i) the individual emission limits for each of the 10 non-Hg metals; (ii) an emission standard for total non-Hg metals; or (iii) a surrogate fPM emission standard of 0.030 lb/MMBtu.[13] EPA is proposing to eliminate the non-Hg HAP metals standards, leaving only the surrogate fPM standard. Further, EPA is proposing to tighten the surrogate fPM standard to 0.010 lb/MMBtu, which is comparable to the MATS new source standard of 0.09 lb/MWh fPM (equivalent to a new coal-fired EGU with a heat rate of 9.0 MMBtu/MWh).[14] EPA also is soliciting comment on whether to revise the fPM standard to an even more stringent level of 0.006 lbs/MMBtu.[15]

EPA's proposal to tighten the fPM limit is based on its evaluation that "most-existing coal-fired EGUs are reporting fPM well below the current fPM emission limit of 3.0E-02 lb/MMBtu" and that "the fleet is achieving these performance levels at lower costs than assumed during promulgation of the original MATS fPM emission limit."[16] EPA acknowledged that it did not identify any new practices, processes, or control technologies for non-Hg metal HAPs.[17] For the reasons discussed below, this rationale is not a sufficient basis for tightening the fPM limit.

1. EPA exceeds its statutory authority in 42 U.S.C. § 7412(d)(6).

42 U.S.C. § 7412(d)(6) requires EPA to "review, and revise as necessary (taking into account *developments* in practices, processes, and control technologies) emission standards . . . every eight years."[18] Among other considerations, EPA deems "[a]ny *improvements* in add-on control technology or other equipment (that were identified and considered during development of the original MACT [Maximum Achievable Control Technology] standards) that could result in additional emission reductions" as such "development" under § 7412(d).[19] But EPA has identified no such "developments" or "improvements." Rather, EPA is revising the fPM limit because the Agency says it now has more information about the cost and performance of existing technology than it did when promulgating the original MATS rule.[20] According to EPA's evaluation of such information, existing controls are cheaper and perform better than anticipated, and as discussed below, EPA's evaluation is flawed.[21]

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[13] *See* Table 1, Emission Limits for New or Reconstructed EGUs, Subpart UUUUU, 40 C.F.R. Part 63.
[14] 88 Fed. Reg. at 24,856.
[15] *Id.* at 24,857.
[16] *Id.* at 24,868.
[17] *Id.* at 24,867-68.
[18] 42 U.S.C. § 7412(d)(6) (emphasis added).
[19] 88 Fed. Reg. at 24,863.
[20] *See id.* at 24,863 fn. 15. *See also* National Emission Standards for Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 77 Fed. Reg. 9304 (Feb. 16, 2012).
[21] *See* 88 Fed. Reg. at 24,867-68.

The statute places guardrails on EPA's discretion to revise the existing standards. EPA does recognize that § 7412(d)(6) provides the Agency with authority to revise emission standards but only on specific grounds. This is most evidently reflected in a mere footnote that EPA inserted in the Proposed Rule, where EPA explains that the term "developments" could encompass "getting new or better information about the performance of an add-on or existing control technology (*e.g.*, emissions data from affected sources showing an add-on control technology performs better than anticipated during development of the rule)."[22] Such an interpretation of the term "developments," however, impermissibly stretches the statutory authority EPA has in revising emission standards.[23] Nowhere does the statute provide EPA the discretion to make such revisions for any other reason not enumerated in the statute. To establish a sufficient basis for tightening the fPM limit, EPA needs to point to a *change* in practices, processes, or control technologies and equipment that justifies the corresponding change to the fPM limit. EPA has not done so. As such, EPA does not have authority to promulgate the revised fPM standards.

2. EPA's proposal to tighten the fPM limit is arbitrary and capricious.

a) EPA's evaluation of current fPM emission levels is flawed.

EPA's proposal to tighten the fPM limit is arbitrary and capricious because its evaluation justifying the proposed tightening of the fPM limit relies on questionable methods of analysis and is flawed. EPA states that its proposal to tighten the fPM standard is based on its review of "developments in the current emission levels of fPM from existing coal-fired EGUs, the costs of control technologies, and the effectiveness of those technologies, as well as the costs of meeting a standard that is more stringent than 3.0 E-02 lb/MMBtu and the other statutory factors."[24] According to EPA:

> Currently, 96 percent of existing coal-fired capacity without known retirement plans before the proposed compliance period already have *demonstrated* an emission rate of 1.5E-02 lb/MMBtu or lower, 91 percent of existing coal-fired capacity have *demonstrated* an emission rate of 1.0E-02 lb/MMBtu or lower, and 72 precent of existing coal-fired capacity have *demonstrated* an emission rate of 6.0E-03 lb/MMBtu or lower."[25]

The statistics above appear to be based on the evaluation summarized in the 2023 Technology Review for the Coal- and Oil-Fired EGU Source Category ("Technical Memo"). EPA should not rely on the 96% threshold as justification for setting the proposed fPM limit at 0.010 lb/MMBtu. EPA's reliance on that evaluation is problematic for several reasons and likely overstates the universe of units that will be able to meet the proposed standard.

[22] *See* 88 Fed. Reg. 24,863 fn. 15.
[23] *See e.g.*, *Utility Air Regulatory Group v. EPA*, 573 U.S. 302, 328 (2014) ("We reaffirm the core administrative-law principle that an agency may not rewrite clear statutory terms to suit its own sense of how the statute should operate.").
[24] *See* 88 Fed. Reg. at 24,857.
[25] *Id.* at 24,868 (emphases added).

First, the evaluation summarized in the Technical Memo excludes units that have shut down, will shut down, or will no longer burn coal/oil by December 31, 2028, or reported data in lbs/MWh.[26] By failing to include units that will shut down or no longer burn coal/oil by December 31, 2028, EPA is not appropriately accounting for units that are likely emitting fPM at levels closer to the current standard than the more stringent proposed fPM limit. EPA should have accounted for such units given that affected EGUs will have up to three years after the effective date of the final rule to demonstrate compliance with the revised limit, and some of the excluded units may not have retired or ceased burning coal or oil by the compliance deadline.[27] These units should be included when evaluating what fPM levels current technologies are capable of achieving.

If the final rule is issued before December 31, 2025, or if the announced retirements are delayed, these excluded units might become subject to a tighter standard that they cannot meet without large capital outlays to install PM control technology despite near-term projected fuel switches or retirement dates that would render such investments not cost-effective. Units that are retiring in the near-term and cannot meet the fPM limit without the installation of controls could be forced to shut down early, which could destabilize electric reliability in their service areas and could have long-lasting effects. Significant dollars would need to be spent to restart certain generating facilities if it is later determined that the decision to shut down early was detrimental to reliable grid operations. A compliance date based on three years after the final rule's effective date is inconsistent with other recent EPA rulemakings, which recognize that significant investments in emissions controls should not be required for EGUs that will retire in the near-term.

Second, the evaluation is based on selected quarterly data from 2017, 2019, and 2021.[28] The Agency fails to explain how and why it selected the specific quarterly data for those years for its evaluation when EPA has all quarterly tests and PM CEMS for the entire fleet since the effective date of the original MATS rule.[29] The Agency also fails to explain why it used a single quarter of data to present the unit's "baseline" and why "[t]he 99th percentile of the *lowest* quarter was chosen to describe the baseline fPM rate for each EGU."[30] This results in a questionable dataset comprised of an extremely small industry sample size and where a single data point is narrowed down for each EGU. For example, for Colstrip, EPA utilized a baseline of 0.018 lb/MMBtu fPM for Unit 3 and 0.021 lb/MMBtu fPM for Unit 4.[31] These numbers do not reflect what is consistently achievable for Colstrip, as Colstrip has already optimized its existing controls to the greatest extent

[26] *See* Technical Memo at PDF p. 2.
[27] 88 Fed. Reg. at 24,868, fn. 20. EPA excluded units that have *announced* that they will shut down by the end of 2028 based on the National Electric Energy Data System ("NEEDS") database, but such retirement plans are not legally binding and thus such units should *not* be excluded from the Agency's evaluation.
[28] Technical Memo at PDF p. 2. ("Quarterly data from 2017 (variable quarters) and 2019 (quarters three and occasionally four) were first reviewed because data for all affected EGUs subject to numeric emissions limits had been previously extracted from CEDRI. In addition, the EPA obtained first and third quarter data for calendar year 2021 for a subset of EGUs with larger fPM rates (generally greater than 1.0E-02 lb/MMBtu for either 2017 or 2019).")
[29] The fact that this information had previously been extracted from CEDRI is no explanation at all. *See id.*
[30] Technical Memo at PDF p. 4. (emphasis added).
[31] *See id.* at PDF p. 4; Appendix C, *id.* at PDF p. 46.

practicable and cannot sustain emissions this low. In 2022, Colstrip achieved approximately 0.022 lb/MMBtu on an annual basis, far above EPA's assumption of the 99[th] percentile of the lowest quarter.

EPA should use all data available from coal-fired EGUs except as noted below with respect to units co-firing natural gas and units with an early retirement date to provide a full picture of achieved fPM emission rates. At the least, EPA should provide justification for its selection of the data, why reliance on the selected data is appropriate, and why certain quarterly data from 2017, 2019, and 2021 were excluded, so that interested stakeholders can verify the accuracy and representativeness of the underlying unit-specific data.[32]

Among other issues in the evaluation, EPA:

- Included some units that will be converted to gas in 2025.
- Did not include data for all quarters but instead selected only quarters with the lowest emissions for some units and excluded other quarters with higher emissions (peaking for some units, ramping for others).
- Excluded some units with no current plans to retire or switch to gas.
- Included some units that have a federally enforceable requirement to cease coal combustion by December 31, 2028 (despite stating that the evaluation excluded coal-fired EGUs that will retire by that date).
- Used the last day of a quarter in some cases and the *average* of 30-day averages for others.
- Included only certain test runs in conducting its distribution analysis.[33]

As to the last point above, EPA should use a historical data pool that encompasses data from different times of year and operating conditions. EPA should include all affected units and all operating quarters in its analysis. Without a more comprehensive data pool, it is difficult to see how EPA could conduct a proper statistical analysis to justify the proposed fPM limit. Talen Montana strongly recommends that EPA correct the deficiencies identified above, as well as make its statistical analysis or Python code used for the fPM evaluation available for public review, to ensure that the proposed fPM limit is not deemed arbitrary and capricious.

[32] It is confusing as to which units EPA included/excluded, and as to which quarterly data sets were included/excluded. EPA failed to explain its rationale for determining which units and data sets should be included or excluded. The lack of explanation, coupled with the large number of supporting documents in the docket, makes it extremely difficult to identify the unit-specific data compiled, analyzed, and ultimately relied upon by EPA and, more importantly, to meaningfully review EPA's evaluation.

[33] For the same reasons articulated in fn. 32, it is confusing as to which test runs EPA included/excluded in its distribution analysis, and EPA's lack of rationale for how it determined which test runs to use.

Third, the evaluation fails to properly address differences in typical unit operating variability by combining stack test data with PM CEMS data. Stack test data represent unit performance at a discrete point in time under full load conditions, whereas PM CEMS data provide a more comprehensive assessment of unit operating variability under all load and process conditions. These are two different data sets and should be treated independently. This is reflected in EPA's performance specification for PM CEMS, which only requires the readings to be within +/-25% of actual stack testing values two-thirds of the time (with the other one-third of the time not having any accuracy constraint) to be considered as valid readings.[34] EPA fails to explain how using such an error prone data set is justified for establishing an emissions standard. The evaluation fails to recognize that PM CEMS is not constrained to a linear correlation with direct emissions. In cases where non-linear correlations are used, an allowable +/-25% error from the correlated value could have a much larger deviation from the actual measured emissions compared to when a linear correlation is used.[35] Any emissions analysis based upon PM CEMS readings must attempt to compare unit performance in the allowable error band.

Further, any unit using a PM CEMS to demonstrate compliance with the emissions limit also must conduct annual emissions measurements under steady-state conditions, which are utilized in either a Response Correlation Audit ("RCA") or Relative Response Audit ("RRA"). The tested unit must show compliance in the short-term via stack testing measurement values and in the long-term via PM CEMS 30-day average values. For these purposes, PM CEMS data and the PM testing measurements should be treated separately and not merged as a data set. Failing to address these differences is especially problematic because EPA is proposing to require PM CEMS as the sole compliance demonstration method, as discussed further below. EPA should thus revise its current "apples-to-oranges" comparison to establish consistently achievable baseline emissions for each unit by using all available data *and* by accounting for any bias related to operating variability.

Fourth, the evaluation fails to take into consideration different control configurations — specifically, the variation in PM removal efficiencies. Some PM control technology, such as hot-side electrostatic precipitators ("ESPs"), inherently have higher particulate emissions. Similarly, depending on the coal combusted, units that utilize hydrated lime as a control technology for minimizing SO_2 and acid gases inherently have higher variability in particulate emissions. Wet flue gas desulfurization ("WFGD") controls, like Colstrip's venturi wet scrubbers, also may result in higher variability in particulate emissions. EPA should factor in these specific control configurations. EPA also should analyze more comprehensive data sets across a longer time frame — rather than using a snapshot of EGUs "demonstrating" the proposed limit during selected quarters prior to concluding that continuous compliance with the proposed limit is achievable.

Fifth, the evaluation fails to recognize that some units have converted to natural gas co-firing. Since these units continue to have the capability to combust coal, all of their emissions data is reported as subject to MATS. However, co-firing natural gas inherently results in significantly

[34] *See* Appendix F, 40 C.F.R. Part 60, Procedure 2.
[35] *See* Appendix B, 40 C.F.R. Part 60, Performance Specification 11.

reduced fPM emissions, which could bias the data set low. EPA should exclude data from units that co-fire natural gas in evaluating what a revised fPM standard should be. Any proposed fPM limit that EPA establishes should be based on fPM from affected units that only combust coal.

Lastly, EPA's evaluation is replete with questionable assumptions and statements. For instance, in the technical reports developed by Sargent & Lundy ("S&L"), on which EPA relies for cost and emissions reductions assumptions, S&L acknowledges that "[b]ased on S&L's recent industry experience, the lowest filterable PM emission rates that an ESP supplier has been willing to guarantee is 0.030 lb/MMBtu for a new and/or completely rebuilt ESP."[36] Yet, the study states that "it is clear that emission levels down to 0.010 lb/MMBtu and below are achievable in most ESP applications based on the reported emissions data" despite acknowledging that the authors are unable to tie a specific performance improvement to a specific set of ESP upgrades.[37] EPA should not rely on such unsupported statements to justify a fPM limit of 0.010 lb/MMBtu.

b) EPA's fPM proposal disproportionately impacts Colstrip.

EPA's proposal to tighten the fPM limit also is arbitrary and capricious because it disproportionately impacts Colstrip. Even if EPA were correct that most units subject to the Proposed Rule would have to do nothing and that the remainder would only need to upgrade existing control technology, the same is not true for Colstrip.[38] As EPA acknowledges in the proposal, Colstrip would need to install new ESPs or FFs — and the Colstrip units, based on EPA's analysis, would be the only two units that would need to do so to comply with the proposed 0.010 lb/MMBtu fPM limit.[39]

Given that EPA's rationale for the Proposed Rule is that *existing* control technology is more effective and cost effective than was known at the time of the original MATS rule — that 91% of units already have either a FF or ESP and are meeting the proposed standard and that the rest would only need to upgrade existing control technology at relatively low cost it simply does not follow that Colstrip should be required to install new, complex, and prohibitively expensive control technology to meet a significantly lower standard.[40] The logical conclusion that should flow from EPA's rationale (assuming that it is not flawed), is that Colstrip should upgrade its *existing* venturi wet scrubber technology to the greatest extent possible.

Instead, EPA proposed that Colstrip should meet the proposed standard by installing new FFs or ESPs at Colstrip. Below is a table summarizing the total annualized cost and the annualized

[36] Sargent & Lundy. PM Incremental Improvement Memo, Doc. ID. EPA-HQ-OAR-2018-0794-5836 at 2 (Mar. 2023). *See also* Technical Memo at PDF p. 8.
[37] PM Incremental Improvement Memo at 2.
[38] *See* Technical Memo at PDF p. 9-10.
[39] *See id.* at PDF p. 10 ("For the *one* facility with existing venturi-type WS (and without an existing ESP or FF), EPA assumes that ESP upgrades will reduce fPM emission to 1.5E-02 lb/MMBtu. To achieve the lower potential fPM standards, EPA assumes that these EGUs would require FF installation, reducing baseline fPM rates by 90% subject to a floor of 2.0 E-03 lb/MMBtu." (emphasis added)).
[40] *See* 88 Fed. Reg. at 24,868; Technical Memo at PDF p. 9-10.

cost EPA attributes for Colstrip to comply with 0.015 lb/MMBtu, 0.010 lb/MMBtu, and 0.006 lb/MMBtu fPM limits:

Table 1: Annual Costs by Potential fPM Standard

	Potential fPM Standard		
Annualized Costs	**0.015 lb/MMBtu**	**0.010 lb/MMBtu**	**0.006 lb/MMBtu**
Total of All Facilities[41]	$13-9-$19.3M	$77.3-$93.2M	$633M
Colstrip[42]	Unit 3: $843,600 Unit 4: $843,600 Total: $1,687,200	Unit 3: $18,992,866 Unit 4: $19,058,306 Total: $38,051,172	Unit 3: $18,992,866 Unit 4: $19,058,306 Total: $38,051,172

As reflected by EPA's own numbers, the annualized cost for Colstrip to comply with the proposed 0.010 lb/MMBtu fPM limit is approximately $38M, which represents 41-49% of the total annualized cost of the Proposed Rule. ***This means that EPA is asking the owners of one facility — representing 0.7% of EGUs subject to the Proposed Rule — to bear nearly 50% of the costs associated with the proposed amendment.***[43] This result is grossly unreasonable, unwarranted, and inconsistent with EPA's rationale for the Proposed Rule and should not be finalized.

c) EPA's cost effectiveness analysis is flawed.

Additionally, EPA's proposal to tighten the fPM standard is arbitrary and capricious because the Agency's cost-benefit analysis is flawed. First, EPA overestimated the benefits attributed to Colstrip if Colstrip were to comply with the 0.010 lb/MMBtu fPM limit. Below is a table summarizing the total fPM emission reductions calculated by EPA and the fPM emission reduction from Colstrip (as calculated by EPA) if Colstrip were to comply with a 0.015 lb/MMBtu, 0.010 lb/MMBtu, and 0.006 lb/MMBtu fPM limits.

[41] Table 7, Technical Memo at PDF p. 12.
[42] Appendix D, *id.* at PDF p. 80 (total annualized costs for Colstrip is calculated by summing the annualized costs for Units 3 and 4).
[43] *See id.* at PDF p. 2 (evaluating fPM rates from a total of 275 individuals EGUs with Colstrip representing two of those EGUs)

Table 2: fPM Emission Reductions by Potential fPM Standard

	Potential fPM Standard		
fPM Emission Reduction	**0.015 lb/MMBtu**	**0.010 lb/MMBtu**	**0.006 lb/MMBtu**
Total of All Facilities[44]	463 tons/yr	2074 tons/yr	6163 tons/yr
Colstrip[45]	Unit 3: 82.3 tons/yr Unit 4: 166.6 tons/yr Total: 248.9 tons/yr	Unit 3: 442.1 tons/yr Unit 4: 528.3 tons/yr Total: 970.4 tons/yr	Unit 3: 442.1 tons/yr Unit 4: 528.3 tons/yr Total: 970.4 tons/yr

As reflected above, EPA associated nearly 47% of the total fPM emission reduction for the proposed 0.010 lb/MMBtu fPM limit to Colstrip. However, that result relies on questionable assumptions. For instance, to achieve the 0.015 lb/MMBtu fPM limit, EPA assumed that Colstrip would conduct maintenance of its venturi wet scrubbers. But maintenance alone (or any other optimization measures) will not further improve the performance of Colstrip's wet scrubbers, as they are already performing at maximum optimization, as discussed above in Section II.A.[46]

Similarly, to achieve both the 0.010 lb/MMBtu and 0.006 lb/MMBtu fPM limits, EPA assumes that Colstrip will install a new FF that would "reduce[] baseline fPM rates by 90% subject to a floor of 2.0E-03 lb/MMBtu."[47] In taking the 99th percentile of the lowest quarter to describe the baseline fPM rate for each EGU, EPA assumes for Colstrip a baseline of 0.018 lb/MMBtu fPM for Unit 3 and 0.021 lb/MMBtu fPM for Unit 4.[48] ***With a 90% reduction, this means that EPA is assuming that Unit 3 would achieve 0.0018 lb/MMBtu fPM (subject to the 0.0020 lb/MMBtu fPM floor caveat) and Unit 4 would achieve 0.0021 lb/MMBtu fPM with a FF.*** But such emission rates are significantly below either the proposed 0.010 lb/MMBtu fPM limit or the more stringent 0.006 lb/MMBtu fPM limit EPA is considering.

Moreover, EPA has provided zero engineering justification for its assumption that any EGU could achieve such emission rates with FFs/baghouses, much less Colstrip's units with their unique configuration. S&L's technical reports in fact states that FF vendors would not be able to guarantee rates as low as EPA's 0.0020 lb/MMBtu fPM floor assumption. For instance, S&L state that "[w]ith the usage of more expensive fiberglass bags with a PTFE [polytetrafluroethylene] membrane coating, it is expected that 0.00375 lb/MMBtu of filterable PM emission could be achieved *but would not be guaranteed by vendors*" and "[a]s such, a best-case scenario would be

[44] Table 6, *id.* at PDF p. 11.
[45] Appendix D, *id.* at PDF p. 80 (total fPM emission reductions for Colstrip are calculated by summing the annualized costs for Units 3 and 4).
[46] *See id.*; Table 5, *id.* at PDF p. 10-12.
[47] *See id.* at PDF p. 10.
[48] *See id.* at PDF p. 4; Appendix C, *id.* at PDF p. 46.

achieving 0.005 lb/MMBtu."[49] Indeed, based on Talen Montana's discussions with consultants and vendors, it may not be possible to guarantee anything under 0.010 lb/MMBtu depending on the configuration. As a result, EPA has grossly overestimated the emission reductions from Colstrip that, coupled with EPA's unjustified assumptions, renders its cost-benefit analysis flawed. For example, EPA estimates fPM emission reductions of 970.4 tons/yr from Colstrip assuming that Colstrip will achieve emission rates of 0.0020 lb/MMBtu fPM for Unit 3 and 0.0021 lb/MMBtu fPM for Unit 4 once controls are installed. However, as discussed below, Colstrip may only attain an emission rate of 0.010 lb/MMBtu fPM, which corresponds to a reduction of 538 tons/yr using EPA's "baseline."

Second, EPA also underestimated the cost per ton of fPM reduced for Colstrip because EPA's cost effectiveness analysis fails to account for the impacts of the IRA. As EPA states in the Proposal, the Agency's estimates in the analysis "do not account for any future changes in the composition of the operational coal-fired EGU fleet that are likely to occur by 2028 as a result of other factors affecting the power sector, such as the Inflation Reduction Act (IRA), future regulatory actions, or changes in economic conditions."[50] This is problematic because it means that EPA is assuming that Colstrip Units 3 and 4 will continue to operate as baseload units for the foreseeable future.[51] But such an assumption is contrary to EPA's post-IRA IPM model, which predicts that Colstrip will shift away from operating as baseload units and its utilization will decrease. Specifically, the post-IRA IPM model — which accounts for future changes that are likely to occur *only* as a result of the IRA and *not* other factors (*e.g.*, Proposed Rule, Proposed GHG Rule) assumes that Colstrip will:

- Through 2030, continue to operate as baseload units with an estimated combined heat input of 113 TBtu/year.[52]
- By 2040, reduce its utilization by 25% so that it is estimated to operate at a combined heat input of 85 TBtu/year.[53]
- By 2050, reduce its utilization by 88% so that it is estimated to operate at a combined heat input of 13 TBtu/year.[54]

As reflected in Attachment B, the cost effectiveness of installing new baghouses at Colstrip significantly decreases over time because of reduced utilization. Utilizing EPA's cost numbers (and presumed emission reductions), the cost effectiveness is estimated to be $39,192/ton fPM reduction in 2030 assuming baseload operation (*i.e.*, 113 TBtu/year). However, the cost

[49] PM Incremental Improvement Memo at 9 (original underline omitted, italicized emphasis added). *See also id.* at 10 ("[S]uppliers *may* be willing to provide a filterable PM guarantee of 0.005 lb/MMBtu for new baghouses with PTFE bags." (original underline omitted, italicized emphasis added)).
[50] 88 Fed. Reg. at 24,869-70.
[51] *See* Technical Memo at PDF p. 11.
[52] Post-IRA 2022 Reference Case, https://www.epa.gov/power-sector-modeling/post-ira-2022-reference-case.
[53] *Id.*
[54] *Id.*

effectiveness would be $51,071/ton fPM by 2040 assuming 75% of baseload utilization and $330,026/ton fPM by 2050 assuming 12% of baseload utilization. The post-IRA IPM model predicts an 88% reduction in fPM emissions from Colstrip by 2050, as a result of the IRA *only* and *without* reductions from the Proposed Rule. Thus, by not incorporating the post-IRA IPM model into the analysis, EPA's cost effectiveness estimate for Colstrip is severely underestimated because it is premised on the Colstrip units operating at baseload utilization across a fifteen-year time horizon and fails to account for the change in utilization that Colstrip is projected to undergo by the latter part of that horizon.[55] In other words, Colstrip is projected to operate and emit less, and thus the same costs will be borne to generate fewer tons of reductions.

Third, EPA fails to account for the reduction in remaining useful life and utilization that also may result from EPA's other rulemakings targeting Colstrip, including the Proposed CCR Rule and the Proposed GHG Rule. For instance, EPA's Proposed GHG Rule, if finalized, would make it challenging for Colstrip to meaningfully operate past 2034, or even 2031, given the proposed 20% capacity factor limit for near-term units in the Proposed GHG Rule (assuming that units would need to adopt that limit from 2031 to 2034). But the Proposed Rule would require the Colstrip owners to spend hundreds of millions of dollars to install FFs or ESPs by 2027 or 2028, only to potentially shut down or seriously curtail operations by 2031 due to the Proposed GHG Rule. In considering the cost effectiveness of the rule, EPA should have considered that the costs to upgrade Colstrip may only be spread over three to four years. This would yield astronomically high annualized costs. Moreover, it is highly improbable that the Colstrip owners would shell out those huge sums of money to operate for three or four more years, as the owners would not be able to recoup those costs. Colstrip shutting down prematurely would have far-reaching ramifications on Montana's economy and the surrounding region and grid stability and transmission, as discussed in Section II.B. — none of which EPA considered.

B. The Cost for Colstrip to Comply with the Proposed 0.010 lb/MMBtu fPM Limit is Exorbitant and Requires Significant Time to Install, Test, and Implement the Controls.

Talen Montana retained Burns and McDonell ("B&M"), an engineering consulting firm, to evaluate the cost and feasibility of control technologies available to Colstrip to comply with the proposed 0.01 lb/MMBtu fPM limit. Working with equipment vendors, B&M evaluated the cost and feasibility of a number of controls, including an ESP or a FF upstream of Colstrip's existing wet scrubbers, a wet ESP, and an ESP or a FF downstream of Colstrip's existing wet scrubbers. For the purposes of these comments, B&M conducted a high-level feasibility and cost review that would need to be refined with additional engineering. Actual costs when compared to this level of estimate could be as much as 50% higher than those projected here. Sufficient time was not

[55] *See* Technical Memo at PDF p. 10.

available during the comment period to further refine the feasibility and costs, and EPA rejected Talen Montana's request for more time to undertake additional efforts.[56]

B&M's estimates for the two units combined are summarized below (see Attachment C for the memorandum from B&M which contains a detailed summary of estimates). The first table is how B&M estimates costs, including cost escalation during construction. The second table is meant to be more aligned with how EPA estimates costs, which leads to underestimates:

[56] *See* Talen Montana's Request for Extension of the Comment Period on the National Emissions Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review, Doc. ID. EPA-HQ-OAR-2018-0794-5880, submitted May 25, 2023 (denied on June 12, 2023).

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Table 3: Annual Costs of Control Options at Colstrip to Meet the Proposed 0.010 lb/MMBtu fPM Limit (B&M Class 5 Feasibility Estimates)

		Installed Capital Cost	*Annualized Cost of Controls*
Total (EPA)[57]			$77.3-$93.2M
Colstrip[58]	**Baghouse (EPA)[59]**		$38,051,172
	Upstream ESP (B&M)	$486.0M	$87.4M
	Upstream FF (B&M)	$404.9M	$78.0M
	Wet ESP (B&M)	$744.5M	$104.9M
	Reheat ESP (B&M)	$263.5M	$41.8M
	Reheat FF (B&M)	$351.2M	$56.5M

Table 4: Annual Costs of Control Options at Colstrip to Meet the Proposed 0.010 lb/MMBtu fPM Limit (B&M Estimates Using EPA Cost Approach)

		Installed Capital Cost	*Annualized Cost of Controls*
Total (EPA)[60]			$77.3-$93.2M
Colstrip[61]	**Baghouse (EPA)[62]**		$38,051,172
	Upstream ESP (B&M)	$406.1M	$77.8M
	Upstream FF (B&M)	$338.3M	$70.1M
	Wet ESP (B&M)	$622.2M	$90.4M
	Reheat ESP (B&M)	$220.2M	$36.6M
	Reheat FF (B&M)	$293.4M	$49.7M

[57] Table 7, Technical Memo at PDF p. 12 (for all EGUs subject to the Proposed Rule).

[58] Cost estimates are based on the following assumptions, scope, and other cost factors. Assumptions include: 85% capacity factor, $15/ton disposal, $200/ton lime, $45/MW power, 15-year life, and 8.25% prime rate. Scope includes: ductwork, foundations, control device, electrical (percent based), no fans, no stack modifications, and ash and lime silos and slurring/feed for upstream control options. Other cost factors include: 5% indirect costs, 8% engineering cost, 5% escalation during construction, 15% contingency costs, and 0% owners' cost.

[59] Appendix D, *id.* at PDF p. 80 (total annualized costs for Colstrip is calculated by summing the annualized costs for Units 3 and 4).

[60] Table 7, Technical Memo at PDF p. 12 (for all EGUs subject to the Proposed Rule).

[61] Cost estimates are based on the following assumptions, scope, and other cost factors. Assumptions include: 85% capacity factor, $15/ton disposal, $200/ton lime, $45/MW power, 15-year life, and 8.25% prime rate. Scope includes: ductwork, foundations, control device, electrical (percent based), no fans, no stack modifications, and ash and lime silos and slurring/feed for upstream control options. Other cost factors include: 0% indirect costs, 8% engineering cost, 0% escalation during construction, 10% contingency costs, and 0% owners' cost.

[62] Appendix D, *id.* at PDF p. 80 (total annualized costs for Colstrip is calculated by summing the annualized costs for Units 3 and 4).

As reflected above, B&M's estimates of annualized costs are significantly higher than EPA's $38M estimate[63] for a new FF at Colstrip, ranging from $41.7M to $104.9M (using B&M's Class 5 Estimate) and $36.6M to $90.3M (using EPA's approach), assuming that Colstrip is just able to meet the proposed 0.010 lb/MMBtu fPM limit.

Further, the cost effectiveness of each of the control options that B&M evaluated are below, where the first B&M column is based on a fPM baseline of 0.022 lb/MMBtu, which represents Colstrip's average fPM emission rate in 2022, and the second B&M column is based on a fPM baseline of 0.0195 lb/MMBtu, which represents the average of the EPA's fPM baselines for Colstrip's Units 3 and 4. The B&M estimates are calculated using EPA's cost approach.[64]

Table 5: Cost Effectiveness of Control Options at Colstrip

		***EPA*[65]**	***B&M 0.022 lb/MMBtu fPM baseline***	***B&M 0.0195 lb/MMBtu fPM baseline***
Colstrip	**Baghouse**	$39,192/ton		
	Upstream ESP		$114,900/ton	$145,000/ton
	Upstream FF		$103,200/ton	$130,300/ton
	Wet ESP		$133,100/ton	$168,000/ton
	Reheat ESP		$53,900/ton	$68,000/ton
	Reheat FF		$73,200/ton	$92,400/ton

As reflected above, the cost effectiveness for Colstrip to install the various controls are significantly higher than EPA's estimate of $39,192/ton (see Section III.A.2.c, assuming baseload operation), ranging from $73,156/ton to $133,104/ton (using the actual 0.022 lb/MMBtu fPM baseline) and from $68,114/ton to $168,132/ton (using an average of EPA's fPM baseline for the units). In the B&M scenarios, the cost per ton is calculated assuming that the units will just be able to achieve 0.010 lb/MMBtu after controls based on the technical review to date, as opposed to EPA's unrealistic assumptions of a 90% reduction in fPM down to 0.002 lb/MMBtu.

At this preliminary stage, the downstream ("Reheat") options are the most cost-effective. The upstream options, and wet ESP option, are even more costly, and come with additional technical challenges, as outlined in the B&M memorandum attached as Attachment C. Despite the lower cost of the Reheat ESP compared to the Reheat FF, the Reheat ESP comes with more technical challenges in meeting the 0.010 lb/MMBtu standard.[66] The Reheat FF has fewer technological challenges and could be the preferred alternative should Colstrip retrofit to comply with the Proposal. However, with an annualized cost of $56.5 M (using B&M's Class 5 estimates)

[63] Note that EPA fails to provide meaningful information as to how annualized control costs were estimated, how capital costs were specifically calculated for Colstrip, or what specific control configurations were accounted for in the estimates. This has made it difficult for Talen Montana to fully comment on EPA's cost estimates.
[64] *Supra* fn. 61.
[65] *See* Attachment B.
[66] *See* Attachment C.

or $49.7M (B&M's estimates using EPA's cost approach), and with a limited lifespan and limited generation to recoup the costs, it is far more likely that Colstrip would suffer a premature retirement with the potential for serious economic disruption and impacts on grid reliability and transmission.

C. Should EPA Finalize the Proposed 0.010 lb/MMBtu fPM Limit, EPA Should Create Additional Subcategories.

EPA should not finalize the 0.010 lb/MMBtu fPM limit. But should EPA do so, the Agency should establish subcategories so that it accounts for Colstrip's unique design and circumstances. Specifically, EPA should establish a subcategory for coal-fired units that use wet scrubbers to address both SO_2 and PM, and that do not have ESPs or FFs, where the fPM limit for those units is no lower than 0.025 lb/MMBtu pursuant to its authority under 42 U.S.C. § 7412(c)(5). As discussed above, application of the 0.010 lb/MMBtu fPM standard to Colstrip is not appropriate or warranted. At most, EPA should require Colstrip to optimize its existing control technology, consistent with the burden borne by other EGUs, as evaluated by the Agency. While Talen Montana believes that its efforts to reduce fPM have already been optimized, a limit of 0.025 lb/MMBtu fPM may be more achievable, especially as compared to the 0.010 lb/MMBtu fPM limit, as it would at least provide Colstrip an opportunity to try to meet the limit without new control technology. It also would provide for a more stringent limit for Colstrip, with additional emission reductions, and would be more appropriate for Colstrip given its unique circumstances.

As an additional alternative, EPA should establish a subcategory with units making an enforceable commitment to retire, where the fPM limit remains at 0.03 lb/MMBtu through retirement.[67] This would be in line with how EPA is providing lead time for older sources in other rulemakings.[68] Creating a subcategory in the MATS rule for units committing to retire would greatly assist companies with moving forward on retirement plans without running the risk of being forced to retire early, which could create reliability concerns or, in the alternative, deliberating whether to install controls and continue operation longer than planned to recoup investments in the controls.

Here, EPA should create a retirement subcategory allowing units to continue to meet the existing 0.03 lb/MMBtu fPM standard so long as they opt-in to the retirement subcategory within 18 months after finalization of the rule, with a retirement date no later than December 31, 2035 (and where continued operation after 2035 would later be permitted if (i) the unit is essential to maintain regional grid reliability, as determined by the Western Regional Adequacy Program, Regional Transmission Organizations, Independent System Operators, North American Electric Reliability Corporation, or other similar system reliability authorities; or (ii) or if EPA determines

[67] A unit should qualify for the retirement subcategory as long as it commits to cease burning coal by the proposed deadline of December 31, 2035.

[68] *See e.g.*, Proposed GHG Rule, 88 Fed. Reg. 33,240, 33,245 (May 23, 2023) (near-term retirement units); Federal "Good Neighbor Plan" for the 2015 Ozone National Ambient Air Quality Standards, 88 Fed. Reg. 36,654 (June 5, 2023).

that additional time is required for transition to renewable or clean energy generation).[69] This would provide units another compliance option and needed flexibility.

D. EPA Should Retain the fPM Emission Monitoring Options.

EGUs that do not qualify for the low emitting EGU program currently demonstrate compliance with the fPM standard by conducting quarterly performance testing (*i.e.*, quarterly stack testing), using a PM continuous parameter monitoring system ("CPMS"), or using a PM CEMS.[70] EPA is proposing to eliminate the quarterly stack testing and CPMS options for all coal-fired EGUs — specifically, requiring all coal-fired EGUs to use PM CEMS "[a]fter considering updated information on the costs for quarterly performance testing compared to the costs of PM CEMS and on the measurement capabilities of PM CEMS, as well as other benefits of using PM CEMS, which include increased transparency and accelerated identification of anomalous emissions."[71] According to EPA, PM CEMS data "supply real-time, quality-assured feedback that can lead to improved control device and power plant operation, which, in turn, can lead to fPM emission reductions."[72]

Talen Montana disagrees with EPA's conclusions and strongly believes that sound engineering approaches using control device operating parameters, such as those found in EPA's required compliance assurance monitoring ("CAM") plans achieve the same ultimate objective of fPM emission reductions. It is unclear how adding another measurement system, particularly given the challenges with PM CEMS as described below, would be cost-effective. Talen Montana urges EPA to retain the option for quarterly stack testing (without any changes to testing frequency) and the CPMS option for all coal-fired EGUs.

1. General Challenges with PM CEMS

EPA should retain the quarterly stack testing and PM CPMS options particularly if the Agency intends to finalize the proposed 0.010 lb/MMBtu fPM emission limit to afford entities flexibility in demonstrating compliance with the more stringent limit. Currently, two-thirds of existing EGUs have chosen to demonstrate compliance via the quarterly stack testing approach, and EPA should continue to retain that option in light of the difficulties with using PM CEMS. EPA justifies the proposed requirement to use PM CEMS based on cost, but the Agency understates the costs of PM CEMS and significantly overstates stack testing costs.[73] The costs associated with installing, maintaining, and operating a PM CEMS far outweigh the costs of demonstrating compliance through stack testing, as discussed below.

[69] It makes sense for units retiring in this time frame to be allowed to continue operations without installation of new controls because the annualized costs for an eight-year period (*i.e.*, installation in the 2027-2028 time period and retirement by the end of 2035) would be excessive. For example, the annualized costs for the reheat FF with an eight-year life would be $76.6M versus $56.5M with a 15-year life.
[70] *See* 40 C.F.R. § 63.10011(b).
[71] *See* 88 Fed. Reg. at 24,857.
[72] *Id.* at 24,872.
[73] *Id.*

In addition, use of PM CEMS may not be appropriate for all coal-fired units given the challenges associated with: (i) meeting the Quality Assurance-Quality Control ("QA-QC") criteria required under Procedure 2; and (ii) establishing the correlation curve using Performance Specification 11 ("PS-11"). First, when a PM CEMS fails to meet the QA-QC criteria required under Procedure 2, the collected data is considered out-of-control and is no longer considered valid.[74] Because the measured emissions values are dependent upon laboratory analysis, an owner/operator has no real time indication that its EGU might have failed the required QA-QC criteria until several weeks after the testing has been completed. This can result in hundreds of hours of monitor downtime being created retroactively after the QA-QC criteria failure has been identified. Monitor downtime is required to be reported as a deviation under the MATS rule, and most states have minimum data availability requirements that could result in enforcement actions. At the more stringent fPM criteria of 0.010 lb/MMBtu (or 0.006 lb/MMBtu), the likelihood of out-of-control periods increases. This downtime is not reflective of poor maintenance or operation but rather the difficulties associated with the required calibration procedure at such low emission levels. Thus, in conjunction with this rulemaking, EPA should include additional provisions in Appendix C of 40 C.F.R. Part 63, Subpart UUUUU to mitigate the effects of this downtime, such as provisional data periods following a failed RRA or RCA. Moreover, there currently is no calibration procedure available that can accurately verify continuous measuring of fPM at levels as low as 0.010 lb/MMBtu, much less 0.006 lb/MMBtu.[75]

EPA attempts to address these issues by proposing to amend Table 2 of 40 C.F.R. Part 63 Subpart UUUUU to require sample volumes of at least 4 dscm per run, rather than at least 1 dscm per run.[76] While the additional sample volume will reduce measurement uncertainty, it does not address the unit and control device operating variability that occurs during correlation testing that would make it difficult to achieve the distinct PM test conditions required under PS-11 and Procedure 2. In addition, when developing the initial correlation curve or conducting ongoing RCAs, emissions controls are de-tuned to simulate upset conditions and to achieve dust loadings at mid- (25-75% of the maximum expected concentration) and high- (50-100% of the maximum expected concentrations) levels.[77] For units equipped with WFGD systems, expanding the test runs to collect 4 dscm of sample volume significantly increases the flyash carryover to the scrubber.[78] This off-spec material is then required to be landfilled instead of beneficially reused.

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[74] *See* Appendix F, 40 C.F.R. Part 60, Procedure 2.

[75] *See* Nicklin, D. et. al., "Techniques to measure particulate matter emissions from stationary sources: A critical technology review using Multi Criteria Decision Analysis (MCDA)," *Journal of Environmental Management*, 296:18-20 (2021).

[76] *See* MATS RTR Rule Text Redline Strikeout document (final) ("Redline Final"), posted on Apr. 25, 2023, at PDF p. 86, 89, 91, 96, 98, Doc. ID. EPA-HQ-OAR-2018-0794-5831. *See also* 88 Fed. Reg. at 24,873-74.

[77] Trying to simulate different ranges of particulates created for test activities often has unintended consequences on the FGD's performance that can take days to normalize and clean up so that the equipment resumes performing as designed. Any additional ash carryover into the FGD increases the opportunity to blind the FGD such that the only recovery is to shut the unit down to add lime or to dump the ash into a storage tank because the material can no longer be stored in the onsite landfill as the chloride content of the sludge, at that point, has become too high.

[78] Ash reinjection may be not feasible for some sources due to stratification issues or ash drop-out effects.

Furthermore, it can take days to weeks for the scrubber chemistry to again reach optimal, steady-state conditions; and maintaining optimal scrubber chemistry is needed to ensure effective removal of mercury emissions. The increased particulate loading will physically impact the equipment and degrade the scrubber's performance, such as: scaling inside the scrubber vessel; plugging spray headers; causing buildup on mist eliminators; and eroding booster and ID fan blades and absorber recirculating pumps.

Second, PM CEMS require the use of PS-11 to establish a correlation curve.[79] For the PS-11 PM CEMS correlation test, a minimum of 15 sets of reference method testing must be conducted that are evenly spaced over three different levels of PM mass concentration by varying process operating conditions, by varying PM control device conditions, or by means of PM spiking.[80] If it is not possible to obtain three distinct levels of PM concentration, zero point testing may be used to perform correlation testing over the maximum range of PM concentration that is practical for the PM CEMS.[81] Each run requires roughly three to four hours, and most sources conduct 18 to 20 test runs for a robust correlation.[82] Barring unpredictable circumstances, based on the proposed sampling time, PS-11 may require seven to ten days to complete. Additional time likely will be needed to maintain the distinct PM test conditions that are required. Sources also will require accurate, preliminary test results to evaluate each test condition and may even need to obtain final results before concluding the test program, which further extend the length and cost of the tests. These activities increase the cost of MATS compliance and overall EGU operation, as well as disrupt the normal operation of the EGU. Ongoing PM CEMS correlation testing with injection of media in the effluent to artificially raise emission levels costs at least $250,000 per test evolution at one source, and testing is required by MATS once every three years. For Colstrip's Units 3 and 4, PM CEMS would cost approximately $136,000/year, whereas quarterly MATS PM stack testing costs approximately $24,000/year. Thus, EPA may have significantly underestimated annual costs associated with a PM CEMS (from $18,111 to $95,397 depending on type) and overestimated annual costs associated with stack testing ($85,127), particularly when specific control configurations are taken into account.[83] Furthermore, the excessive costs of installing and maintaining PM CEMS become even more onerous if required on a unit with limited remaining life (see earlier discussion on how other rules may force retirement, cessation of coal, or decreased capacity factors, or if an early retirement subcategory is created).

More importantly, EPA has failed to show how correlations can be developed on data sets where the upper end of the emissions testing is capped at 0.010 lb/MMBtu fPM following PS-11 requirements. Emissions levels are supposed to be evenly distributed between the low, mid, and high PM emission levels. Even when allowing for a low-emitting unit to use a zero point in the correlation, a correlation still needs data variation to be a valid regression model. By limiting the

[79] *See* Appendix B, 40 C.F.R. Part 60, Performance Specification 11.
[80] *See id.*
[81] *See id.*
[82] *See id.*
[83] 88 Fed. Reg. 24,872-73.

dataset pursuant to the proposed 0.010 lb/MMBtu fPM limit EPA needs to establish that the PS-11 correlation will still be valid at such low levels.

2. Colstrip's Challenges with PM CEMS

Colstrip has utilized PM CEMS as a particulate control performance indicator in its PM CAM Plan since 2014. The initial PM CEMS were a light scattering technology that encountered times when they did not accurately indicate particulate emissions from the wet venturi scrubber at Colstrip Units 3&4. In September 2020, the PM CEMS were changed to the MSI BetaGuard 3.0 PM CEMS. The BetaGuard PM CEMS has performed better than the light scattering technology at Colstrip; however, it still exhibits variability that would not be acceptable to be used as a continuous compliance monitor. When compared to the quarterly MATS PM compliance test results, the BetaGuard PM CEMS has provided mg/m^3 values that varied from the RM5 mg/m^3 value by -24% to +31%. Talen Montana believes this range of variability with the PM CEMS is not acceptable for use as a compliance monitor, but its use as part of a PM CAM Plan like Colstrip utilizes, is reasonable.

The PM CAM Plan is a requirement under Colstrip's Title V Operating Permit to help ensure compliance to the particulate standard utilizing performance indicators and an operational parameter. The performance indicators include opacity monitoring and PM CEMS, and the operational parameter is scrubber plumb bob delta P.

PM CEMS requirements under Colstrip's PM CAM Plan are robust and include:

- Installation per manufacturer's standards.
- Daily zero and span checks using manufacturer's standards.
- Initial correlation based on three levels (zero, normal operations, and at scrubber operations that increase PM but not at a level that puts Colstrip's Title V requirements at risk). This initial correlation used three RM5 runs at normal operations and two RM5 runs at the higher PM level. This correlation relates PM CEMS mg/m^3 to RM5 mg/m^3.
- A PM CEMS CAM Plan excursion limit in terms of mg/m^3 is established.
- A PM CEMS CAM Plan excursion requires a prompt investigation to identify and correct the condition, followed by a RM5 test to confirm compliance with the particulate standard.
- On a quarterly basis, one RM5 test (comprised of three runs) will be conducted to update the initial correlation. If the result from the average of the three runs differs

from the initial correlation by 25% or more of the CAM Plan excursion limit, then the initial correlation will be repeated.

- An on-going PM CEMS correlation adjustment will be made quarterly based on the correlation from all RM5 test data.

- PM CEMS daily averages are submitted to MDEQ on a quarterly basis.

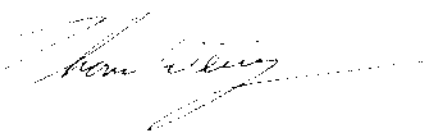
Given Colstrip's experience with the use of PM CEMS as a performance indicator, which shows that the CEMS results are highly variable and not reliable, EPA should not finalize the CEMS requirement in the Proposed Rule. If EPA does finalize the CEMS requirement, EPA should: (i) carve out units like Colstrip Units 3 and 4 that already have a CAMS plan that utilizes performance indicators and operational parameters to ensure compliance with the particulate standard; and (ii) not require PM CEMS for units that would only be subject to MATS for a limited time after the effective date of the final rule.

IV. CONCLUSION

Talen Montana appreciates the opportunity to submit comments on the Proposed Rule. Talen Montana respectfully requests that EPA consider the recommendations above to ensure that the Agency accounts for Colstrip's unique design and circumstances, as well as to account for the prohibitive costs that Colstrip faces if it were forced to comply with the proposed fPM limit. Colstrip is vital to Montana, and premature retirement could jeopardize Montanans' access to affordable and reliable electricity, especially during extreme weather conditions.

Dated: June 23, 2023

Respectfully submitted,



Thomas Weissinger
Sr. Director – Environmental
Talen Energy
thomas.weissinger@talenenergy.com

TALEN MONTANA

ATTACHMENT A

Please see native Excel file "ATTACHMENT A" accompanying Talen Montana's comments.

TALEN MONTANA

ATTACHMENT B

The following table summarizes how the cost effectiveness of installing a new baghouse at Colstrip was calculated using EPA's post-IRA IPM model. The table was prepared by Trinity Consultants, which Talen Montana retained for the purposes of preparing comments on the Proposed Rule.

Colstrip New Baghouse Cost Effectiveness

Scenario	Unit	Heat Input (MMBtu/yr)	Current FPM Emission Factor (lb/MMBtu)	FPM Emissions (tpy)	% Reduction in FPM without Proposed Rule	New Baghouse Cost ($/yr)	FPM Emission Factor with New Baghouse (lb/MMBtu)	FPM Emissions with New Baghouse (tpy)	FPM Emissions Reduction from New Baghouse (tpy)	New Baghouse Cost Effectiveness ($/ton)
EPA Proposed Emission Reductions (Baseload Operation)	3	55,255,556	0.018	497.3		18,992,866	0.0020	54.7	442.6	42,912
	4	55,904,762	0.021	587.0		19,058,306	0.0021	58.7	528.3	36,075
	Total	**111,160,317**		**1084.3**		**38,051,172**		**113.4**	**970.9**	**39,192**
Emission Reductions Using 2040 Base Case	3	42,374,312	0.018	381.4		18,992,866	0.0020	42.0	339.4	55,957
	4	42,925,688	0.021	450.7		19,058,306	0.0021	45.07	405.6	46,982
	Total	**85,300,000**		**832.1**	**23%**	**38,051,172**		**87.0**	**745.1**	**51,071**
Emission Reductions Using 2050 Base Case	3	6,557,338	0.018	59.0		18,992,866	0.0020	6.5	52.5	361,602
	4	6,642,662	0.021	69.7		19,058,306	0.0021	6.97	62.8	303,606
	Total	**13,200,000**		**128.8**	**88%**	**38,051,172**		**13.5**	**115.3**	**330,026**

Scenarios. The scenarios presented for calculating the cost effectiveness of installing a baghouse at Colstrip are: (i) based on the utilization and heat input predicted EPA's post-IRA IPM model from present to 2050;[84] (ii) based on EPA's "baseline" for Colstrip, which represents the 99th percentile of the lowest

[84] Final Version of the RIA [Regulatory Impact Analysis] for the Proposed EGU MATS RTR, Doc ID. EPA-HQ-OAR-2018-0794-5837; Post-IRA 2022 Reference Case, https://www.epa.gov/power-sector-modeling/post-ira-2022-reference-case.

quarter among the 2017, 2019, and 2021 data EPA evaluated;[85] and (iii) based on EPA's assumption that installing a baghouse would "reduc[e] baseline fPM rates by 90% subject to a floor of 2.0E-03 lb/MMBtu.[86]

Heat Input (MMBtu/yr). Heat input is calculated by EPA's Post-IRA 2022 Reference Case.[87]

Current FPM Emission Factor (lb/MMBtu). Current fPM emission factor is EPA's "baseline" for Colstrip, which represents the 99th percentile of the lowest quarter among the 2017, 2019, and 2021 data EPA evaluated.[88]

FPM Emissions (tpy). fPM emissions are calculated by multiplying the Heat Input (MMBtu/yr) by the Current FPM Emission Factor (lb/MMBtu) and diving by 2000 lb/ton.

New Baghouse Cost (S/yr). New baghouse cost is EPA's annualized cost estimate for Colstrip to achieve compliance with the proposed 0.010 lb/MMBtu fPM limit via a new baghouse.[89]

FPM Emission Factor with New Baghouse (lb/MMBtu). fPM emission factor with new baghouse is based on EPA's assumption that installing a baghouse would "reduc[e] baseline fPM rates by 90% subject to a floor of 2.0E-03 lb/MMBtu.[90]

FPM Emissions with New Baghouse (tpy). fPM emissions with new baghouse are calculated by multiplying the Heat Input (MMBtu/yr) by the fPM New Baghouse Emissions factor (lb/MMBtu) and then diving by 2000 lb/ton.

FPM Emissions Reduction from New Baghouse (tpy). fPM emission reduction from new baghouse is calculated by subtracting fPM emissions with new baghouse (tpy) and fPM emissions (tpy).

New baghouse cost effectiveness (S/ton). New baghouse cost effectiveness is calculated by dividing new baghouse cost (S/yr) by fPM emissions reduction from new baghouse (tpy).

[85] *See* Technical Memo at PDF p. 4.
[86] *See id.* at PDF p. 10.
[87] Post-IRA 2022 Reference Case, https://www.epa.gov/power-sector-modeling/post-ira-2022-reference-case.
[88] *See id.* at PDF p. 4.
[89] Appendix D, *id.* at PDF p. 80.
[90] *See id.* at PDF p. 10.

ATTACHMENT C

BURNS McDONNELL

June 23, 2023

Mr. Gordon Criswell
Talen Montana
580 Willow Ave, PO Box 38
Colstrip, MT 59323

Re: Talen Energy Colstrip/ Mercury and Air Toxics Standards (MATS) Analysis

Dear Mr. Criswell:

Talen Montana, LLC (Talen) engaged Burns & McDonnell Engineering Company, Inc. (BMcD) to assist it in evaluating the potential cost impacts of complying with the potential particulate limits in EPA's proposed MATS rule. The scope of work included the following:

1. Evaluate the proposed filterable particulate matter limit of 0.01 lb fPM/mmBtu and evaluate what particulate control technologies could maintain the limit at Colstrip.
2. Provide an AACE Class 5 estimate of the necessary capital improvements and operations/maintenance costs.

Background Information

The Colstrip units being evaluated are two approximately 740 MW units (net) that fire PRB coal and utilize a plumb bob wet scrubber to simultaneously remove filterable particulate and sulfur dioxide (SO_2) from the flue gas. This approach has the advantage of using the alkalinity inherent to PRB fly ash as reagent to help remove SO_2. However, this control technology is not as effective at removing fine particulate matter (fPM) as more modern particulate control technologies. The system was originally designed to achieve an emission rate of 0.05 lb fPM/mmBtu at a plumb bob pressure drop of 17".

Over the years the Colstrip plant has worked with scrubber consultants and engineers to improve the fPM removal ability of the scrubber. Changes and upgrades have increased the pressure drop to the system maximum across the scrubber's plumb bob, optimized mist eliminators, and installed flow distribution plates to optimize scrubber performance. Beyond the scrubber, Colstrip has made operational changes to improve the fPM removal including improving boiler wall cleaning to impact the size of the fPM and increase removal across the scrubber, implemented a combustion optimization system, and performed preventative maintenance on the coal mills to maintain the coal grind size and thus the resulting

fPM size. However, even with these previous scrubber upgrades, operational changes and maintenance practices focused on fPM removal, the best single quarterly fPM compliance test the unit has achieved (not maintained) is 0.017 lb/mmBtu.

The upgraded system typically operates between 0.020 and 0.027 lb fPM/mmBtu. The average quarterly fPM compliance tests for 2022 was 0.022 lb/mmBtu. These rates are in compliance with the current limit of 0.030 lb fPM/mmBtu but would not be in compliance with the proposed MATS rule. The proposed MATS rule would reduce the fPM limit to 0.010 lb fPM/mmBtu.

Particulate Control Technology Discussion

Potential Particulate Control Options to Achieve New MATS fPM Limit

BMcD evaluated several options to reduce fPM at Colstrip. These options include dry/wet electrostatic precipitators (ESP) and baghouses/fabric filters (FF). The traditional location for a dry ESP or FF is between the air heater outlet and the scrubber. A wet ESP would be located after the scrubber systems while the flue gas is saturated. Colstrip Units have a feature that is uncommon at wet scrubbed United States power plants. After each scrubber vessel there is a reheat system that warms the flue gas approximately 60°F which results in a 'dry' (non-saturated) flue gas. This situation creates the opportunity to utilize an ESP or FF downstream of the scrubber provided that the reheat system is operational.

Burns & McDonnell (BMcD) discussed these different conditions with Southern Environmental Inc. (SEI) – an equipment supplier – and requested budgetary pricing for each option as SEI can supply all of these technologies. SEI indicated they believe that all of these options can achieve the proposed 0.010 lb fPM/mmBtu emission rate. However, guaranteeing that these rates can be continuously maintained at the stack is not certain for all technologies. We identify a few technological challenges to consider when evaluating these technologies below:

ESP/FF Located Upstream of Scrubber

If the fPM control device is installed upstream of the scrubbers, there is a question of whether the scrubbers will remove or re-introduce fPM into the flue gas. An ESP or FF upstream of the scrubber can be guaranteed to maintain 0.010 lb fPM/mmBtu at the particulate control device outlet. Nearly all of the fPM passing through the scrubber is particulate smaller than 2.5 microns ($PM_{2.5}$) as the scrubber is excellent at

removing larger particulates but not great at removing smaller particulates. If an ESP or FF is installed upstream of the scrubber, all of the PM entering the scrubber will be $PM_{2.5}$and the scrubber will do little to reduce the $PM_{2.5}$ concentrations. Also, since the existing scrubbers use the alkalinity inherent to PRB fly ash as reagent to help remove SO_2, fly ash that is collected in the ESP/FF would have to be reintroduced to the scrubber for SO_2 removal and this fly ash could be re-emitted as particulate after the scrubber. Therefore, this evaluation has assumed that additional lime will be used in lieu of fly ash to control SO_2 emissions. This does not eliminate the risk the scrubbers could re-emit fPM but does reduce the risk.

Wet ESP

A wet ESP downstream of the scrubber can be guaranteed to maintain 0.010 lb fPM/mmBtu at the particulate control device outlet/stack inlet. However, the flue gas entering the scrubber must be saturated and the stack is not designed for wet flue gas. The flue gas would need to be captured prior to the existing reheat system, routed to the wet ESP and then either routed back to the existing reheat system or through a new reheat system and fan. Because of the complexity of the tie in and the fact the wet ESP and reheat system would need to be made out of high alloy to address corrosion; the cost estimate demonstrates this is the most expensive option.

ESP/FF Located Downstream of Scrubber

An ESP or FF downstream of the scrubber is expected to maintain 0.010 lb fPM/mmBtu. A FF can be guaranteed to maintain 0.010 lb fPM/mmBtu if the flue gas is maintained at least 30° above the dew point. This is critical because if the bags in the fabric filter become wetted for even a short period, the bags could be damaged catastrophically and fail to perform. This requirement could be challenging if there is an upset in the reheat system or any time steam may not be available.

An ESP can likely be guaranteed to maintain 0.010 lb fPM/mmBtu; however, there is some concern due to the fPM particle size in this location. ESP systems can remove $PM_{2.5}$ and smaller particles. However, it is more difficult to remove the smaller particles than the larger particles. Further evaluation or testing maybe required for a guarantee to be provided. The advantage of a dry ESP in this location is a dry ESP is not as susceptible as a FF to wet flue gas conditions. The dry ESP cannot operate in saturated flue gas, and continuous operation in saturated conditions would damage

the ESP, but short-lived incidents with exposure to saturated flue gas are not expected to catastrophically damage the ESP.

Cost Estimate for Particulate Control Technology

Burns & McDonnell produced AACE Class 5 estimates for these control technologies based on the 'flange to flange' budgetary price information SEI shared and BMcD's previous experience in building up the fully-installed cost of such projects. The estimated costs are intended to include new ductwork, foundations, support steel, insulation, ash piping, electrical upgrades, new ash silos, new carbon injection systems, and (as applicable) new lime silos and feed systems. The costs do not include new fans, stack modifications, taxes, water treatment, or significant demolition. The Class 5 estimates presented here include: indirects, engineering, escalation during the project, and contingency. The cost estimating method favored by the EPA differs from typical industry cost estimates. Key differences of the EPA cost estimating method include removal of indirect costs and all escalation, and reducing the contingency to 10%. The Class 5 estimates we prepared, and the EPA cost estimates do not include Owners costs or an EPC fee.

The capital cost estimates provided are considered AACE Class 5 feasibility estimates and are provided in 2023 dollars unless indicated otherwise. The estimates were built up using heavy construction cost data from RSMeans, vendor input for major equipment, and in-house information from other projects. Engineering, Construction Management, Start-Up, and Contingency are based on percentages of the total direct cost for these Class 5 estimates. All sales taxes are excluded from the estimates. Talen should not use these estimates to establish the project budget as they are only intended to assist in selecting the preferred solution(s) at the site. The selected alternative(s) should be investigated further, with additional design and more detailed quantity buildup completed along with soliciting local contractors for labor pricing prior to establishing the project budget.

BMcD's estimates, analyses, and recommendations contained in this email are based on professional experience, qualifications, and judgment. BMcD has no control over weather; cost and availability of labor, material, and equipment; labor productivity; energy or commodity pricing; demand or usage; population demographics; market conditions; changes in technology; and other economic or political factors affecting such estimates, analyses, and recommendations. Therefore, BMcD makes no guarantee or warranty (actual, expressed, or implied) that actual results will not vary,

perhaps significantly, from the estimates, analyses, and recommendations contained herein.

In the preparation of this, information provided by Talen was used by BMcD to make certain assumptions with respect to conditions that may exist in the future. While BMcD believes the assumptions made are reasonable for the purposes of this study, BMcD makes no representation that the conditions assumed will, in fact, occur. In addition, while BMcD has no reason to believe that the information provided by Talen, and on which this report is based, is inaccurate in any material respect, BMcD has not independently verified such information and cannot guarantee its accuracy or completeness.

Cost Summary

We prepared the following cost summary of the various options. Table 1 is a summary of key assumptions while Tables 2-5 are the costs summarized and levelized to dollars per ton. Tables 2 and 4 assume the baseline is the 2022 average emission rate of 0.022 lb fPM/mmBtu while Tables 3 and 5 assume the average emission rate the EPA used in the MATS evaluation of Colstrip (0.0195 lb fPM/mmBtu).

Table 1: Summary of Capital and O&M Costs

Capacity Factor:	85%
Life, years	15
Cost of Money, %	8.25
Capital Recovery Factor	0.118619
Property Taxes, Insurance	0
Disposal cost, $/ton	15
Power cost, $/MW	45
Lime cost, $/ton	200

Table 2: Summary of Capital, O&M and Levelized Costs for Class 5 Estimate Method, 2022 Emission Baseline

Summary of Particulate Emissions Control Costs from Colstrip									
PM-10 Control Alternative (Ranked by PM-10 Rate)	**PM Removal Efficiency** % (Note B)	**Emissions**				**Economic Impacts**			
		Emission Rate lb/MMBtu	Hourly Emission Lbs/Hr	Annual Emission Tons/yr	Emission Reduction Tons/yr	Installed Capital Cost in millions $	Annual O & M Cost in millions $	Total Annual Cost millions/yr	Average Control Cost $/ton
Upstream ESP	54.55	0.010	152	566	679	486.0	29.8	87.4	128,700
Upstream FF	54.55	0.010	152	566	679	404.9	29.9	78.0	114,900
Wet ESP	54.55	0.010	152	566	679	744.5	16.6	104.9	154,500
Reheat ESP	54.55	0.010	152	566	679	263.5	10.5	41.8	61,600
Reheat FF	54.55	0.010	152	566	679	351.2	14.9	56.5	83,200
2022 Baseline (Scrubber)		0.022	334	1245		N/A	N/A	N/A	N/A

Table 3: Summary of Capital, O&M and Levelized Costs for Class 5 Estimate Method, EPA Emission Baseline

Summary of Particulate Emissions Control Costs from Colstrip									
PM-10 Control Alternative (Ranked by PM-10 Rate)	**PM Removal Efficiency** % (Note B)	**Emissions**				**Economic Impacts**			
		Emission Rate lb/MMBtu	Hourly Emission Lbs/Hr	Annual Emission Tons/yr	Emission Reduction Tons/yr	Installed Capital Cost in millions $	Annual O & M Cost in millions $	Total Annual Cost millions/yr	Average Control Cost $/ton
Upstream ESP	48.72	0.010	152	566	538	486.0	29.8	87.4	162,500
Upstream FF	48.72	0.010	152	566	538	404.9	29.9	78.0	145,000
Wet ESP	48.72	0.010	152	566	538	744.5	16.6	104.9	195,000
Reheat ESP	48.72	0.010	152	566	538	263.5	10.5	41.8	77,700
Reheat FF	48.72	0.010	152	566	538	351.2	14.9	56.5	105,000
2022 Baseline (Scrubber)		0.0195	296	1103		N/A	N/A	N/A	N/A

Table 4: Summary of Capital, O&M and Levelized Costs for EPA Estimate Method, 2022 Emission Baseline

Summary of Particulate Emissions Control Costs from Colstrip									
		Emissions				Economic Impacts			
PM-10 Control Alternative (Ranked by PM-10 Rate)	PM Removal Efficiency % (Note B)	Emission Rate lb/MMBtu	Hourly Emission Lbs/Hr	Annual Emission Tons/yr	Emission Reduction Tons/yr	Installed Capital Cost in millions $	Annual O & M Cost in millions $	Total Annual Cost millions/yr	Average Control Cost $/ton
Upstream ESP	54.55	0.010	152	566	679	406.1	29.8	78.0	114,900
Upstream FF	54.55	0.010	152	566	679	338.3	29.9	70.1	103,200
Wet ESP	54.55	0.010	152	566	679	622.2	16.6	90.4	133,100
Reheat ESP	54.55	0.010	152	566	679	220.2	10.5	36.6	53,900
Reheat FF	54.55	0.010	152	566	679	293.4	14.9	49.7	73,200
2022 Baseline (Scrubber)		0.022	334	1245		N/A	N/A	N/A	N/A

Table 5: Summary of Capital, O&M and Levelized Costs for EPA Estimate Method, EPA Emission Baseline

Summary of Particulate Emissions Control Costs from Colstrip									
PM-10 Control Alternative (Ranked by PM-10 Rate)	**PM Removal Efficiency** % (Note B)	**Emissions**				**Economic Impacts**			
		Emission Rate lb/MMBtu	Hourly Emission Lbs/Hr	Annual Emission Tons/yr	Emission Reduction Tons/yr	Installed Capital Cost in millions $	Annual O & M Cost in millions $	Total Annual Cost millions/yr	Average Control Cost $/ton
Upstream ESP	48.72	0.010	152	566	538	406.1	29.8	78.0	145,000
Upstream FF	48.72	0.010	152	566	538	338.3	29.9	70.1	130,300
Wet ESP	48.72	0.010	152	566	538	622.2	16.6	90.4	168,000
Reheat ESP	48.72	0.010	152	566	538	220.2	10.5	36.6	68,000
Reheat FF	48.72	0.010	152	566	538	293.4	14.9	49.7	92,400
2022 Baseline (Scrubber)		0.0195	296	1103		N/A	N/A	N/A	N/A

We appreciate the opportunity to assist in this evaluation. Should you have any questions or wish to schedule a follow-up meeting, please contact Doug Randall at (816) 822-3455.

Sincerely,

Burns & McDonnell Engineering Company, Inc.

Douglas Randall
Associate Controls Specialist

Exhibit 2

NorthWestern Comments

NorthWestern Energy
Delivering a Bright Future

June 23, 2023

Via Federal eRulemaking Portal [regulations.gov]
Via Email [benish.sarah@epa.gov]

Ms. Sarah Benish
Sector Policies and Programs Division
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

Re: NorthWestern Corporation Comments re: Proposal on National Emissions Standards for Hazardous Air Pollutants: Coal and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review

Docket ID No. EPA–HQ–OAR–2018–0794

Dear Ms. Benish:

On behalf of NorthWestern Corporation d/b/a NorthWestern Energy ("NorthWestern"), I am commenting on the U.S. Environmental Protection Agency's ("EPA's") proposed changes to the National Emissions Standard for Hazardous Air Pollutants ("NESHAP") for the Coal- and Oil-fired Electric Utility Steam Electric Generating Units ("EGUs"), commonly known as the Mercury and Air Toxics Standard ("MATS"). The proposed changes were published in the *Federal Register* on April 24, 2023, at 88 Fed. Reg. 24,854 ("Proposed Rule"). As discussed herein, the Proposed Rule poses significant challenges for NorthWestern and its rate-paying customers in Montana, will likely have environmental and Environmental Justice impacts that are contrary to Administration policies, and is likely unlawful.

NorthWestern agrees with and incorporates by reference the concurrent comments submitted by Talen Montana, LLC ("Talen") as part owner and based on its knowledge as operator of Units 3 and 4 of the Colstrip Steam Electric Station ("Colstrip"). NorthWestern. NorthWestern endeavors to minimize duplication of the Talen comments.

These comments are organized into the following sections:

- Summary of Comments;
- NorthWestern's commitment to environmental and climate responsibility;
- NorthWestern's commitment to Environmental Justice;
- NorthWestern's energy portfolio and role in serving Montana electricity customers;

- Transmission limitations on the ability to import power;
- Inability to close Colstrip prior to 2035 without constructing replacement thermal baseload capacity;
- Costs of installing additional controls on Colstrip;
- Colstrip and NorthWestern portfolio scenarios;
- Cost and safety hazards of closing Colstrip prior to 2036 without constructing replacement thermal baseload capacity;
- Consequences of diverting capital from other beneficial projects to comply with the Proposed Rule
- Prejudice to NorthWestern of the Proposed Rule;
- Statutory and Administrative Procedure Act deficiencies with the Proposed Rule; and,
- Requests.

Each of these subjects is addressed below.

1. Summary of Comments

The Proposed Rule, if finalized in its current form, is deeply harmful to the residents of Montana and will work in contradiction to the President's environmental objectives in Executive Order 13990, and Executive Order 12898, as most recently amended by the President on April 23, 2023. This is a result of the specific history and current electrical generation and grid limitations of NorthWestern and Montana.

As EPA is aware, Colstrip is in full compliance with the current MATS standards, which EPA does not dispute meet the statutory objectives of the Clean Air Act. However, as EPA also acknowledges and Talen explains in detail, Colstrip cannot come into compliance with either of the candidate standards set forth the Proposed Rule without extensive supplementation of existing pollution controls – the venturi wet scrubbers currently in use cannot meet the proposed standards. As detailed by Talen, upgrading Colstrip to comply with the Proposed Rule is cost-prohibitive, resulting in at least $350,000,000 in capital costs, plus an additional $15 million annual operating costs. *See* Talen Comments, Attachment C. NorthWestern and residents of Montana would bear the majority of these costs. Colstrip is the only facility identified by EPA as facing this predicament.

In addition, if Colstrip is closed in the near term, NorthWestern cannot provide adequate and reliable electrical service for its Montana customers without new replacement baseload capacity. Colstrip currently plays an essential role in baseload capacity for NorthWestern, and there are no near-term feasible means to replace Colstrip's capacity with other existing NorthWestern capacity or market purchases from in-state or out-of-

state sources. Imported power is further constrained by significant transmission limitations.

NorthWestern has modeled and evaluated scenarios for closure of Colstrip in 2025, 2030, and 2035, and 2042 in its May 2023 Integrated Resource Plan. The 2025 and 2030 closure scenarios expose NorthWestern to extreme degrees of market risk, resulting high probabilities of ruinous market electricity purchases and grid instability.

If the Proposed Rule is finalized in its current form, NorthWestern will therefore be faced with an array of costly and environmentally unsound choices. Renewables are not a viable option because NorthWestern's portfolio is already renewable-heavy, and additional renewable capacity will not solve the problem of variable generation deficits NorthWestern currently experiences.

On the one hand, if NorthWestern participates in upgrades to Colstrip, it will either need to materially increase electricity rates for Montana customers, or redirect funding previously earmarked for other projects. Projects that may be abandoned to fund Colstrip upgrades include transmission improvements, planned upgrades to facilities that are in excess of maintenance requirements, or other non-required beneficial capital projects. The vast majority of these have direct environmental benefits, deferral of which would undermine or even fully negate the environmental benefits of the Proposed Rule.

Alternatively, the only baseload capacity that can conceivably be constructed within the statutory compliance deadlines is new natural gas generation capacity. Carbon-free baseload alternatives are either unproven, or require significantly longer development times. The net result would be a substantial investment in a new, large, long-lived fossil fuel based generation assets. This outcome would clearly contradict the objectives of E.O. 13990.

NorthWestern has been substantially and uniquely prejudiced by EPA's course of action. The 2020 Residual Risk Technology Review ("RTR") confirmed that Colstrip's pollution controls satisfy the requirements of the Clean Air Act, and there have been no significant technological or implementation advancements since the 2020 RTR that would change that conclusion. Had NorthWestern known that EPA would undertake a complete reversal of the conclusions of the 2020 RTR just three years later, NorthWestern could have factored compliance costs earlier and more robustly into NorthWestern's Integrated Resource Planning process.

The combination of prejudice to NorthWestern and the ratepayers of Montana, coupled with mis-application of the technology review provisions of Clean Air Act Section 112(d)(6), places EPA at significant risk of having the Proposed Rule declared as arbitrary and capricious and contrary to law.

Consequently, NorthWestern respectfully urges EPA to use its discretion under the Clean Air Act and E.O.s 13990 and 12898 to take the following actions:

(1). Withdraw the Proposed Rule, revisiting the subject closer to the eight year timeframe provided in Clean Air Act Section 112(d)(6), or earlier if and when actual technological advancements occurring since the 2020 RTR satisfy the conditions for revisitation of standards set forth in Section 112(d)(6);

(2). If the Proposed Rule is not withdrawn, create a source subcategory that exempts those facilities presently employing wet scrubber technology without ESP or fabric filter add-ons until the next RTR; and/or

(3). Create a retirement subcategory allowing units to continue to meet the existing 0.03 lb/MMBtu fPM standard so long as they opt-in to the retirement subcategory within 18 months after finalization of the rule, with a retirement date no later than December 31, 2035 (and where continued operation after 2035 would later be permitted if (i) the unit is essential to maintain regional grid reliability, as determined by the Western Regional Adequacy Program, Regional Transmission Organizations, Independent System Operators, North American Electric Reliability Corporation, or other similar system reliability authorities; or (ii) or if EPA determines that additional time is required to allow the unit to transition to renewable or clean energy generation).

The foregoing courses of action are the only options that comply with the statutory requirements of the Clean Air and Administrative Procedure Acts, and are consistent with the objectives of E.O.s 13990 and 12898.

2. NorthWestern's commitment to environmental and climate responsibility

NorthWestern is a strong proponent of environmental protection, consistent with its responsibilities to deliver reliable, cost-efficient electrical service to its customers. To that end, NorthWestern has a corporate objective to achieve net zero emissions by 2050 ("Net Zero 2050"). A copy is attached as Exhibit A. NorthWestern already has one of the highest percentages of carbon-free generation in the United States, and has significant additional carbon and other emissions-reducing projects in development. Although NorthWestern disagrees strongly with the Proposed Rule, this should not be confused with opposition to environmental protection or the objectives of E.O. 13990.

3. *NorthWestern's commitment to Environmental Justice*

NorthWestern shares the Administration's commitment to Environmental Justice. NorthWestern has extensive programs to support critically needed affordable and reliable energy to low income and tribal communities within NorthWestern's service area. It is not clear from the Proposed Rule and supporting documentation that EPA has fully considered the Environmental Justice consequences of the Proposed Rule, especially as related to Montana and the Environmental Justice communities in Montana. For example, 25% of NorthWestern's service base is low income, with approximately half of those below poverty standards. The costs of the Proposed Rule will fall in important ways on those who are least able to afford it, and as detailed further in Sections 4 and 5, the grid reliability dangers posed by Proposed Rule also threaten the most vulnerable in Montana. In addition to the essential services NorthWestern provides, Colstrip and the Rosebud Mine supplying Colstrip directly employ 82 people of tribal affiliation, or 14% of the facilities' total employment. Premature closure of Colstrip would devastate these families and the Colstrip community as a whole.

Consistent with the Administration's updates and revisions to Executive Order 12898 (Executive Order on Revitalizing Our Nation's Commitment to Environmental Justice, April 21, 2023), EPA must evaluate these Environmental Justice effects in comparison with the claimed health benefits of the Proposed Rule. This is an acute issue where the environmental benefits claimed from the rule are extremely incremental (from 99.6% fPM existing removal efficiency to 99.8% efficiency under the Proposed Rule), and start from a baseline level of performance that is highly protective of human health and in compliance with Clean Air Act objectives.

4. *NorthWestern's energy portfolio and role in serving Montana electricity customers*

NorthWestern provides energy and capacity to customers in Montana, South Dakota, and Nebraska. For transmission interconnection reasons explained later, Colstrip is principally relevant and important to electrical supply in Montana. NorthWestern provides electricity to customers in its service areas in Montana and also serves as a "Balancing Authority," which means that NorthWestern is responsible for ensuring that the supply of and demand for electricity within our Balancing Authority Area are in equilibrium or balanced.

The Montana Public Service Commission ("MPSC") oversees NorthWestern's resource planning activities and the recovery of costs of generation and power purchase agreements. At all times relevant to this matter, the MPSC had set forth the following objectives that Montana utilities should meet: (a) reliability; (b) affordability; (c) environmental responsibility; (d) optimality; and (e) transparency. *See* MCA 69-3-1202.

NorthWestern thus has legal obligations to reliably and affordably supply electricity to its customers in Montana and to do so cost-effectively while seeking to reduce adverse environmental impacts. In addition to those legal obligations, NorthWestern recognizes that as a practical matter its customers count on NorthWestern to provide the cost effective electricity used to power their homes and businesses and the critical infrastructure upon which they rely.

Under Montana law, NorthWestern, as a regulated public utility, is required to prepare and file a plan every 3 years for meeting the requirements of its customers in the most cost-effective manner consistent with its obligation to serve under the law. MCA § 69-3-1204(1)(a).

The plan must include:

a. an evaluation of the full range of cost-effective means for the public utility to meet the service requirements of its Montana customers, including conservation or similar improvements in the efficiency by which services are used and including demand-side management programs in accordance with 69-3-1209;
b. an annual electric demand and energy forecast developed pursuant to commission rules that includes energy and demand forecasts for each year within the planning period and historical data, as required by commission rule;
c. assessment of planning reserve margins and contingency plans for the acquisition of additional resources developed pursuant to commission rules;
d. an assessment of the need for additional resources and the utility's plan for acquiring resources;
e. the proposed process the utility intends to use to solicit bids for energy and capacity resources to be acquired through a competitive solicitation process in accordance with 69-3-1207; and
f. descriptions of at least two alternate scenarios that can be used to represent the costs and benefits from increasing amounts of renewable energy resources and demand-side management programs, based on rules developed by the commission.

Planning for reliable service requires NorthWestern to ensure that it has enough electricity generation resources to meet its customer demands every hour of the year, even with changing weather and demands. As a matter of physics, for the electric grid to operate reliably, the amount of energy generated ("generation") and the consumption of that energy ("load") must be equal or in balance. Generation and load must be in balance year-to-year, month-to-month, day-to-day, hour-by-hour, and minute-by minute for the electric grid to remain stable. Because of the long lead times needed to build or acquire new electrical generation or transmission assets or negotiate power purchase contracts,

NorthWestern, like other electric utilities, makes plans for the supply of electricity years in advance. This long-term planning is also required by law. In Montana, NorthWestern prepares formal, written plans that are filed with the MPSC. Attached as Exhibits B-1 and B-2 to these comments is a copy of Volume 1 of NorthWestern's 2019 Electricity Resource Procurement Plan ("ERPP"), which was filed at the MPSC in Docket No. N2018.11.78.[1] Attached as Exhibit C is the 2020 Supplement to the 2019 Plan. Attached as Exhibits D and E are the two volumes of NorthWestern's May 2023 Integrated Resource Plan ("2023 IRP").

NorthWestern began to serve customers in Montana when it purchased the transmission and distribution assets of the Montana Power Company in 2002. Initially, NorthWestern did not own any generation assets to serve Montana customers. This situation was not ideal as it required NorthWestern to purchase all the electricity needed to serve customers. These purchases were and continue to be from a market that experiences volatile pricing and increasing supply shortages.

Since then, NorthWestern has acquired various types of electricity supply resources. Most notably, in 2014 NorthWestern purchased a portfolio of hydroelectric facilities in Montana. NorthWestern has also made significant investments in wind power. NorthWestern currently owns approximately 1,271 megawatts ("MW") of generation capacity and has long-term contracts for another 680 MWs.

NorthWestern's generation portfolio now is a diverse mix of resources, the majority of which are renewable. The portfolio includes 497-MW of hydroelectric maximum delivered capacity, 455-MW of maximum delivered wind capacity, 222-MW of coal capacity, 202-MW of natural gas capacity, 87-MW of waste coal capacity, and 187-MW of solar capacity. The Company also has market capacity contracts for 460 MWs which have price or market exposure. In summary, NorthWestern's current portfolio has 202 MW of natural gas capacity, 309 MW of coal and waste coal based capacity, and 1,129 MW of renewable fueled generation.

The table below lists NorthWestern's existing owned generation facilities and contracted generation resources along with some additional resources that the Company expects to bring online, including the Yellowstone County Generating Station, which is currently under construction.

[1] Volume 2, which includes underlying hourly data among other material, is so voluminous that NorthWestern usually only provides it in electronic form. Given the size of Volume 2 and the number of additional files that would require submission, it is not provided with these comments. NorthWestern will certainly provide it if desired or needed for EPA's evaluation.

MT Portfolio Resources
Thompson Falls
Cochrane
Ryan
Rainbow
Holter
Morony
Black Eagle
Hauser
Mystic
Madison
Turnbull Hydro LLC
State of MT DNRC (Broadwater Dam)
Tiber Montana LLC
+ QF Hydro Resources
Basin Creek
DGGS 1 -3
Yellowstone County Generating Station (Laurel)
Colstrip 30% U4
Yellowstone Energy Limited Partnership (BGI) (QF)
Colstrip Energy Limited Partnership (QF)
Judith Gap Energy LLC
Spion Kop Wind
Two Dot Wind Farm
+QF Wind Resources
+QF Solar Resources
Clenera Apex I (QF)
Morgan Stanley (3 yr) On Peak Only, Q1, Q3, Q4 - expires 10/31/2023
Morgan Stanley (3 yr) ATC, Q1, Q3, Q4 - expires 10/31/2023
Powerex (3 yr) Contingency Reserves - expires 12/31/2023
Powerex (5 yr) - expires 12/31/2027
Heartland (10 yr) - (150 MW to 200 MW) - expires 12/31/2031

NorthWestern currently has over 200 percent more wind generation than its Colstrip generation. In terms of generation asset nameplate capacity, the two largest, by far, are hydroelectric assets and the fleet of wind farms, both of which are carbon free. NorthWestern's portfolio of solar generating facilities has also been increasing in recent years. At the same time, it is important to note the difference between "nameplate" and "accredited" capacity. Nameplate capacity refers to the maximum electrical generating output (in MW) that a generator can sustain over a specified period of time when not restricted by seasonal or other "deratings" (events that reduce effective output), as measured in accordance with the United States Department of Energy standards. In contrast, accredited capacity means the electrical rating given to generating equipment that meets the Utility's criteria for uniform rating of equipment. These criteria include but are not limited to reliability, availability, type of equipment and the degree of coordination between the Distributed Generation and the Utility. Wind and solar accredited capacities are much lower than their nameplate capacities, because of the seasonal and weather variability of those generation sources. Hydroelectric generation also has a gap between nameplate and accredited capacity, reflecting periods when generation is restricted by stream flows. All this is reflected in the table below:

Hydro Generation - Online		
Total	497	298
Thermal/Natural Gas Generation - Online		
Total	255	195
Thermal/Coal Generation - Online		
Total	309	288
Wind Generation - Online		
Total	455	59
Solar Generation - Online		
Total	97	1
Short Term Contracts - Max		
	460	460

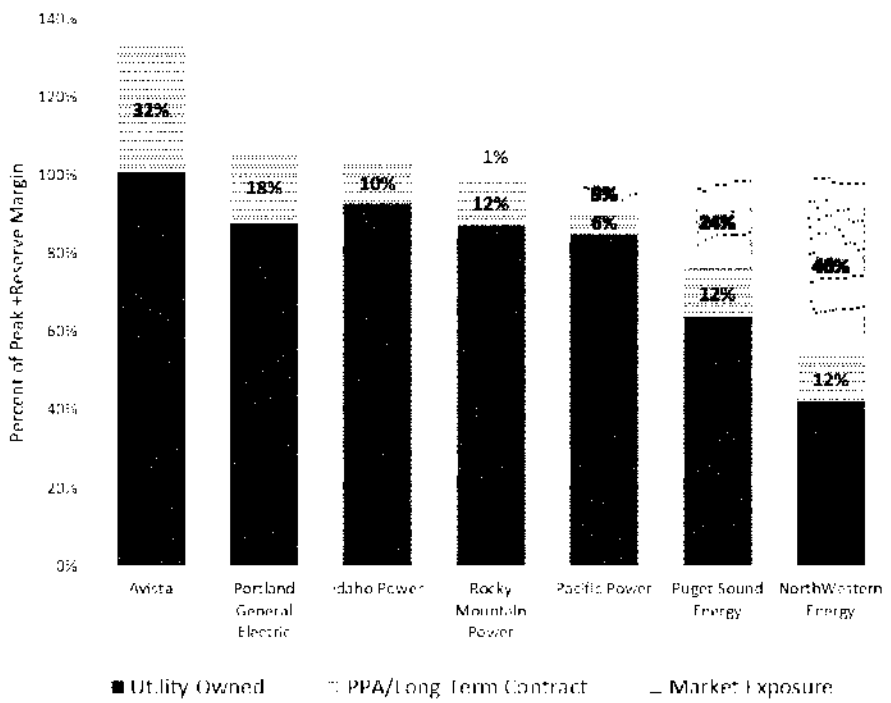
In fact, while news coverage of NorthWestern often discusses the coal or natural gas facilities, the proportion of NorthWestern's generation resources that are renewable compares highly favorable to other utilities. In 2022, 59% of NorthWestern's electric generation was from carbon-free resources, which compares to 40% of megawatt hours generated by the U.S. electric power industry as a whole.

Despite the significant improvement in NorthWestern's generation capacity, including acquisitions of hydroelectric plants and wind farms, NorthWestern's resource portfolio is not yet sufficient or "reliable", as defined by regional planning organizations.

In periods of peak loads, NorthWestern often does not have sufficient capacity, meaning that NorthWestern must make market purchases of electricity to meet customers' needs.

Periods of peak load are those times when customer demand for electricity is particularly high. This tends to occur during periods of extreme weather, during the coldest winter days (below 10 degrees Fahrenheit) when more electricity is used for heating purposes and during the hottest summer days (above 90 degrees Fahrenheit) when more electricity is used for cooling. The availability or unavailability of other resources can also be a significant factor. For example, the amount of rain during a season or snow during a preceding winter impacts the generation of our hydroelectric facilities. Similarly, there are periods when more or less wind power is generated. Unfortunately, critical weather in Montana typically occurs with high pressure, meaning wind generation more frequently than not generates very little power during these critical conditions. Those instances when there is both high demand for electricity and less available renewable generation can be particularly challenging from both a reliability and customer affordability perspective.

The chart below, which is drawn from NorthWestern's 2019 Electricity Supply Resource Procurement Plan filed at the MPSC, illustrates the difference between NorthWestern's available capacity and that of its regional peers.



As the chart shows, NorthWestern relies more heavily on market purchases to meet its electric needs during peak periods than any other utility in the Pacific Northwest. There are significant disadvantages to being reliant on market purchases to manage peak demand periods.

As an initial matter, prices for electricity tend to increase when there is greater demand. Typically, NorthWestern's periods of peak demand coincide with those of other utilities in the region. At the same time market prices are increasing during the critical weather events, especially winter, the available wind and solar generation frequently diminishes, sometimes to near zero. The same weather patterns that impact Montana also frequently impact other states in the region. As a result, the demand for electricity is high during such periods, which drives up the prices. Those higher prices increase our costs and ultimately lead to higher bills for our customers, which impacts their household and business finances and the broader Montana economy. Importantly the costs of electricity obtained through power purchase contracts are substantially passed directly through to consumers. NorthWestern's lower income and smaller business customers tend to be most sensitive to the impacts of increased electric costs.

In addition to pricing, there is also the question of availability. Simply put, it is not prudent to assume that there will always be sufficient out-of-state power that can be both purchased and transmitted to Montana. The limitations of the transmission system and how those impact NorthWestern's ability to bring electricity into Montana to serve customers are discussed in more detail in Section 5. This section further discusses the availability of electricity to purchase, setting aside the increasing uncertainty of whether it can be transmitted to Montana.

In recent years, several large power plants in Montana and adjacent states have closed. J.E. Corette, with a nameplate capacity of 163 megawatts (MWs), was closed in 2015. Colstrip Units 1 and 2, each with nameplate capacities of 307 MWs, ceased operation in early 2020. That same year, the Boardman plant in Oregon, 601 MWs, and Unit 1 of the Centralia plant in Washington, 730 MWs, both closed. Idaho Power ended its participation in Unit 1 of the Valmy facility, 254 MWs, in 2019 and the operations there completely halted in 2021.

In addition to those significant retirements that have already taken place, more retirements are anticipated in the near future. In particular, Unit 2 of the Centralia plant, 670 MWs, is scheduled to cease operation in 2025, as is North Valmy Unit 2, which is 289 MWs.

In summary, there is much less reliable electrical generation available in Montana and the Pacific Northwest (the market) than in the past, and the closures scheduled for 2025 are expected to result in the loss of an additional 959 MWs of nameplate capacity by the end of that year. Importantly, these losses of nameplate capacity are all for facilities for which

their accredited capacity is very close to their nameplate capacity. As a result, the regional portfolio is shifting away from high-accredited to low-accredited generation sources. A difficult situation is expected to get worse and grave reliability concerns are no longer just the province of states like California and Texas that have had well publicized blackouts.

Equally importantly in terms of timing and supply, 185 MW of NorthWestern's current market contract capacity will be expiring by mid-2024. Given the retirements of facilities throughout the region, NorthWestern does not have confidence it will be able to renew or replace these contracts when they expire, especially under as favorable of terms. To the extent any can be replaced, market conditions indicate that they will be at much higher costs, which will be passed directly on to customers.

Montana's decision to deregulate its electricity sector, and the concurrent decision by Montana Power Company to sell all of its electricity generation portfolio, coupled with subsequent plant closures, has placed NorthWestern in a critically tenuous position of not being able to reliably serve its customers' needs during periods of peak loads, such as hot summer and most critically, cold winter days. This is in spite of NorthWestern acquiring a substantial amount of generation since 2011, none of which has been carbon-emitting. In NorthWestern's 2017 and 2019 Electricity Supply Resource Plan (and in the 2020 supplement), NorthWestern identified significant deficiencies and risks to customers due to our portfolio's reliance on market purchases, much of which originates from out of state, plus a lack of reserve margin to reliably serve our customers. These Plans empirically and analytically set forth particular capacity vulnerabilities that need to be addressed in order to continue to provide reliable service to our customers. In particular, NorthWestern identified a need to have resources available to serve 20-hour, 10-hour, and 5-hour periods in the future when there will be capacity portfolio deficits.

Notably, NorthWestern at that time did not identify a need for new baseload capacity. As stated in the 2019 ERPP, "NorthWestern's resource portfolio generally generates enough energy to serve average load, but is significantly short both peaking and flexible capacity." A key reason that NorthWestern did not plan for new baseload capacity was that it had made substantial investments in Colstrip to comply with the 2012 MATS Rule and regional haze requirements. NorthWestern knew that Colstrip would be able to achieve Clean Air Act statutory and health-based standards over the medium-to-long term. NorthWestern had contemporaneous public assurances from EPA to that effect. And NorthWestern knew that there were no significant pollution control technology advancements in the offing that would change control performance. Consequently, the 2019 ERPP and 2020 Supplement focused investment on the identified peaking and flexible capacity needs, as well as improving transmission capabilities.

Based on those identified needs, NorthWestern issued a Request for Proposals (RFP) in January 2020. This RFP was explicitly for any type of generation that was able to provide

capacity for those three distinct shorter-duration categories. This RFP was conducted by an independent and respected third party. NorthWestern was not directly involved in the evaluation process. After receiving the identified short-list from the evaluator, NorthWestern in conjunction with the evaluator selected three proposals: the Yellowstone Generating Station to address the 20-hour need and a portion of the 10-hour capacity need, a 5-year power purchase agreement with Powerex Corp., the marketing partner of BC Hydro System, to address the remaining portion of the 10-hour duration need and part of the 5-hour need, and a contract with Beartooth Energy Storage, LLC for a 50 MW, 4-hour battery facility to be located near Billings for the remaining portion of the 5-hour duration need. No RFP was issued to upgrade or replace Colstrip capacity, because no need had been identified.

5. ***Transmission limitations on the ability to import power***

The United States electric grid has an Eastern Interconnection, a Western Interconnection, and a separate Texas interconnection, which each operate largely independently with limited transfers of power between them. NorthWestern's Montana electric transmission system is located in the Western Interconnection of the United States grid. NorthWestern also has an electric transmission system in South Dakota; however, that is in the Eastern Interconnection and there is no effective means to transfer electricity from NorthWestern's South Dakota generation sources to Montana. In addition, those generation sources are fully subscribed.

NorthWestern manages its transmission system in Montana as a Balancing Authority Area ("BAA") operator, with responsibility for ensuring that system supply and demand are in constant balance. To support the continuous flow of electricity, NorthWestern is also responsible to provide ancillary services such as scheduling, system control, and dispatch; regulation and frequency response; and contingency reserves. When demand and supply are not in balance, equipment damages, cascading outages, or blackouts can result. As a BAA operator, NorthWestern must meet and operate within the reliability standards established by NERC.

NorthWestern's Montana electric transmission system covers over 97,000 square miles. This integrated system includes about 7,000 miles of transmission lines. The system includes over 280 circuit segments, 79 transmission or transmission/distribution substations, and over 100,000 poles and towers. The transmission system integrates resources and loads through 500 kilovolt (kV), 230 kV, 161 kV, 115 kV, 100 kV, 69 kV, and 50 kV lines to deliver power to the various load centers dispersed throughout NorthWestern's service territory.

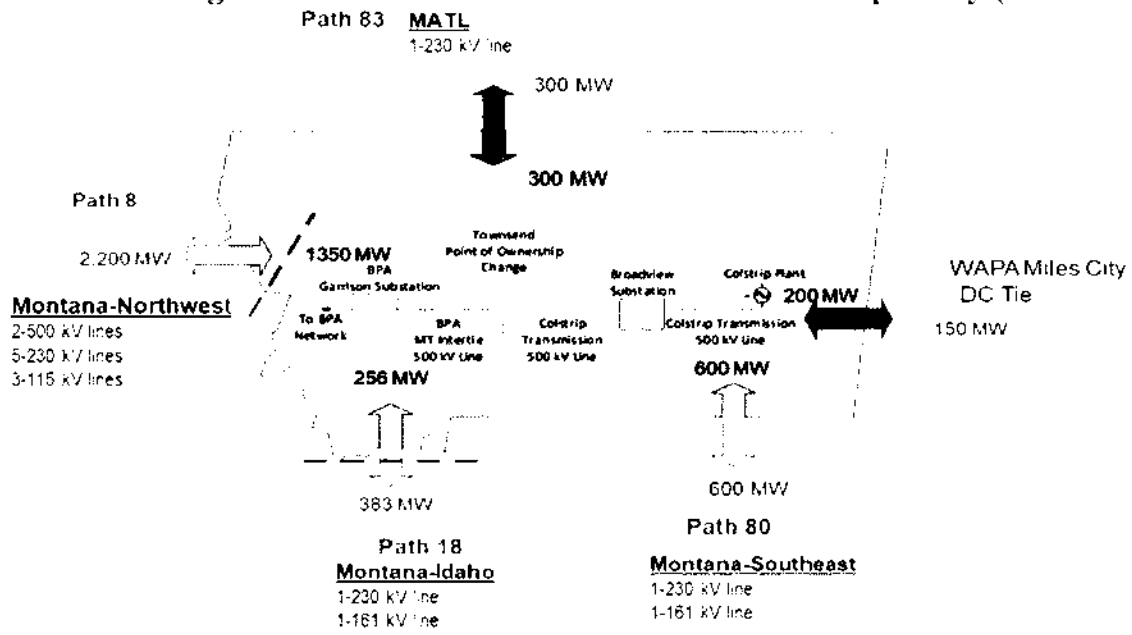
Montana was traditionally an exporter of power. However, following the 2015 closure of the J.E. Corette plant (163 MW) and the 2020 closure of Colstrip units 1 and 2 (614 MW), the NorthWestern BAA has transitioned from being a net exporter of energy to a

net importer. During the most critical periods, times of peak energy demand, NorthWestern now relies heavily on imports, and frequently on non-firm transmission, to meet customer needs. "Firm" transmission is transmission capacity reserved for the full duration of the transmission service agreement. In contrast, "non-firm" is transmission capacity that can be used only on an as-available basis when unreserved capacity is available on the transmission system. The existing NorthWestern transmission system was not designed to transmit imports, serving such a large portion of customer load.

NorthWestern's transmission system and its connections to utilities in other states were not designed to import significant additional amounts of electricity. While there are existing lines and interconnections, there is limited capacity available on those facilities and further complications and congestion outside of Montana, making it imprudent for NorthWestern to assume it can import additional power when needed. Redundancy in the reliable transmission of energy is also extremely important because an outage on one transmission line can cause overloads to another. Relying on transmission lines and interconnections to import the electricity needed to serve such a large portion of our Montana load inherently increases the risk of outages and the resulting failure to serve customers during times of greatest electricity demand.

NorthWestern's transmission system has interconnections to six major transmission utilities – Idaho Power Company, Avista Corporation ("Avista"), BPA, Western Area Power Administration ("WAPA"), PacifiCorp, and the Alberta Electric System Operator as noted in Figure 1 below. NorthWestern transfers power in and out of Montana through Western Electricity Coordinating Council ("WECC") rated "Paths", each consisting of transmission lines crossing Montana's borders. To the west and south are Paths 8, 18, and 80, and to the north is Path 83, on the Montana Alberta Tie Line ("MATL"), and these are shown in the figure below. Note MATL is not owned or operated by NorthWestern. Figure 1 shows the Total Transmission Capability amounts, or TTCs. However, TTC represents the total designed and approved transmission capacity, not the amount of additional available capacity above the capacity already in use.

Figure 1: WECC Paths and Total Transfer Capability (TTC in MW)



As can be seen, the largest single path to the Pacific Northwest and other Western Interconnection markets is Path 8, which consists of the interconnections with BPA and Avista. As the figure indicates, Path 8 is made up of multiple lines and has a significantly higher TTC than the other paths.

However, there is very little Available Transmission Capacity ("ATC"), which is the difference between the TTC and the amount of capacity already reserved by existing transmission commitments, that could be used to import additional electricity to NorthWestern's system via Path 8 for the foreseeable future. In short, Path 8 is a significant and convenient interstate transmission path, but its capacity has already largely been reserved.

Path 80, located in the southeastern portion of Montana, theoretically has more ATC. However, it is a very complex path that experiences significant congestion and curtailments due to reliability issues. Path 80 is greatly impacted by what is going on in other transmission owners' transmission systems outside of Montana. Path 80 is affected by loads and generation in Wyoming, Colorado, and Utah as well as other potential impacts. Moreover, Path 80 is far from the Pacific Northwest market, causing greater potential congestion if it is used to import power from that area. As one example of the problems with Path 80, during the significant cold weather of February 2021, there were curtailments of transmission on Path 80 at the worst possible time. Path 80 very commonly has non-firm transmission curtailed (and sometimes even firm transmission) as a result of congestion on the transmission system in Wyoming and further south. This

most commonly happens during peak events, but also during non-peak events. That is the reason NorthWestern currently has no remaining firm import ATC posted on Path 80.

Path 83 provides transmission capacity between Montana and Canada. Path 83 consists of a single 230 kV line – the Montana Alberta Tie Line, which is not owned by NorthWestern. Most of the activity on the Path is related to wind projects located in north central Montana, also not owned or controlled by NorthWestern. Additionally, Path 83 is a very complex path that routinely must be curtailed to manage generation and loads. This path also contributes significantly to our challenges and limitations across an internal path we refer to as "South of Great Falls". The South of Great Falls path frequently must be curtailed and has impacts on the Great Falls, Billings, Helena and Butte areas.

Path 18 has relatively smaller overall capacity and is highly utilized today with little import capacity remaining. As described in Paragraph 23 below, for several years ending in 2012 NorthWestern attempted to permit an upgrade to the transmission capacity of Path 18 through the proposed Mountain States Transmission Intertie ("MSTI"). Ultimately, that effort failed. Consequently, Path 18 offers little potential for increased imports at this time.

In summary, ATC is quite limited for import into the NorthWestern BAA. Figure 2 below is a snapshot as of February 23, 2023 of long-term firm ATC that is posted on NorthWestern's Open Access Same-time Information System ("OASIS") for each year displayed. The OASIS provides real-time, up-to-date information and access to transmission system capacity for all customers. Figure 2 clearly indicates that there is very little to zero firm ATC to import from any Path of import.

Figure 2: Import Available Transfer Capability (ATC in MW)

Yearly Firm ATC by Year (as of 2/23/2023)

	BPA Import	Yearly Firm ATC
Path 8	2023	0
	2024	31
	2025	47
	AVAT Import	
	2023	196
	2024	162
	2025	162
	BRDY Import	
Path 18	2023	59
	2024	59
	2025	0
	Jeff Import	
	2023	72
	2024	72
	2025	72
	YTP/Crossover Import	
Path 80	2023	0
	2024	0
	2025	0

Even when there is available capacity on a path, NorthWestern has to compete with other transmission customers/users. The operation of NorthWestern's transmission system is subject to regulation by FERC in accordance with NorthWestern's FERC-jurisdictional Open Access Transmission Tariff ("OATT"). As a result, NorthWestern is required to provide transmission service to several types of customers on a first come first serve basis, which means that there is competition for ATC among many potential users of the transmission system. NorthWestern's transmission system serves four types of customers – retail, network, interconnection, and point to point ("PTP"). In addition to NorthWestern's retail customers, our FERC customers include electric cooperatives, federal marketing agencies (e.g. BPA and WAPA), and "choice" customers, who are all customers that do not receive their electric supply service from NorthWestern. This means that there are many non-NorthWestern entities within the NorthWestern BAA that are competing for available transmission, constraining transmission of power at critical peak times when customers need that power the most. Critically, this transmission competition is becoming much greater as in-state generation shuts down. As noted above, transmission capacity is awarded on a first-come, first-served basis. Of critical importance is that NorthWestern's own "native" load does not receive any preference over other eligible customers. In addition, there are rules governing what is a valid transmission service request or network service designation. For example, long-term network transmission service designation requests must be tied to legitimate network resources with valid contracts for service in place. Figure 3 displays the current firm transmission imports that are reserved on a long-term basis by parties. Many of these reservations are not for service to NorthWestern's customers. This transmission capacity

is reserved under NorthWestern's FERC OATT, which includes point-to-point customer wheeling into and out of NorthWestern's system, and Network customers, including some reservations by NorthWestern, importing energy from outside of Montana and into NorthWestern's transmission system to serve load.

Figure 3: Long-term Firm Reservations by Customer Type

Long Term Firm Reservations from Import Interface Paths (as of 01/27/2023)				
	Path 8 Imports	Path 83 Imports	Path 80 Imports	
Network	690	225	37	
Point to Point	342	0	31	
Total	1032	225	68	1325

While NorthWestern faces challenges resulting from limited transmission capacity, it might seem the obvious solution would be to build new transmission lines. However, that is only a solution in theory; in reality, it is not currently a practical option. As an initial matter, increased transmission is only useful in addressing capacity constraints if it connects to a generation resource willing and able to sell capacity to NorthWestern, and as explained in Section 3, there is significant uncertainty on that point going forward given recent and planned power plant closures.

Even if an additional generation resource is located, attempting to build the transmission lines to that resource is a difficult, time-consuming, and expensive endeavor that might not succeed. NorthWestern would have to gain approval from the Montana Department of Environmental Quality ("DEQ") to permit, site, and construct new transmission infrastructure by obtaining a certificate of compliance under the Montana Major Facility Siting Act ("MFSA") and gain rights-of-way over the proposed transmission path. Securing easements across land owned privately or by state or federal agencies can be extremely challenging. Permitting approval would likely be required from other state or federal agencies as well. The transmission infrastructure would also have to be designed to satisfy regulatory requirements enforced by FERC, NERC, and WECC. The combination of all these factors means that actually obtaining authority to construct a transmission line would take several years, if it is achievable at all.

Increasing transmission capacity, if it could be accomplished, would require upgrades to not only NorthWestern's system, but potentially other transmission systems outside of Montana. Of course, work in other states would require satisfying the regulatory requirements in those jurisdictions. The need to cooperate with more than one utility and perform work in multiple jurisdictions makes transmission upgrades even more difficult as a solution.

As an example, in 2012, after spending four years and approximately $24 million, NorthWestern indefinitely postponed its attempts to secure permits for the proposed 500kV Mountain States Transmission Intertie ("MSTI"), which would have provided an additional connection outside of Montana. This transmission line would have extended from southwestern Montana to southcentral Idaho and would have been capable of transmitting approximately 1000 MW of power. The abandonment of the project was due to continued permitting issues including never-ending process, analysis and movement of goalposts, as well as difficulty in getting all agencies to timely act and cooperate to define a reasonable end to the permitting process. Although the Inflation Reduction Act has made available some resources for such projects, the regulatory environment in terms of approval timelines has not improved since 2012.

There are no presently proposed interstate transmission lines or upgrades that would facilitate added import capability into Montana. Given the MSTI experience, if a project was proposed tomorrow, it could require 7-10 years to design, permit, construct, and bring into operation, if that was even possible.

6. Costs of installing additional controls on Colstrip

The options and anticipated costs of installing additional controls on Colstrip to comply with the Proposed Rule are set forth in detail in Talen's comments, accompanied by a supporting analysis prepared by Burns & McDonnell. NorthWestern joins the Talen comments and will not reiterate them here. NorthWestern's comments assume capital costs of at least $350,000,000, and annualized costs of $57,000,000, based on the working assumption that Reheat Fabric Filter is the most viable technology Colstrip would deploy to comply with the Proposed Rule. ("Proposed Rule Costs").

7. Colstrip and NorthWestern portfolio scenarios

NorthWestern has not planned for the Proposed Rule or the Proposed Rule Costs. Because the Proposed Rule reflects a reversal or prior EPA analyses and conclusions, and is not based on new information, there was no reason for NorthWestern to anticipate the Proposed Rule or the Proposed Rule Costs in the 2019 ERPP or 2020 Supplement, and neither the Proposed Rule or the Proposed Rule Costs were factored into the recently completed 2023 IRP.[2]

As explained in Sections 4 and 5, Colstrip is central to NorthWestern's generation portfolio, and purchasing additional market capacity from existing generation sources to replace Colstrip's capacity carries high costs and risks from a generation resource or

[2] Although the 2023 IRP was released shortly after the publication of the Proposed Rule, the Proposed Rule was released far too close to the finalization of the 2023 IRP to be factored into the analyses and planning.

transmission perspective. Faced with hundreds of millions of dollars in unanticipated costs, NorthWestern therefore has three principal options: (a) close Colstrip in the immediate future and engage in an emergency program to construct additional baseload capacity; (b) install the controls required by the Proposed Rule and attempt to recoup the Proposed Rule Costs through rate increases; or (c) postpone or abandon existing planned capital projects to free up resources to address the unanticipated Proposed Rule Costs without raising rates. These scenarios are discussed in the following sections.

8. Cost and safety hazards of closing Colstrip prior to 2036 without constructing replacement thermal baseload capacity

Although the Proposed Rule came as a surprise to NorthWestern, NorthWestern closely examined Colstrip closure scenarios as part of the 2023 IRP process. This included scenarios involving closures in 2025, 2030, and 2035. The 2025 and 2030 closure scenarios resulted in materially higher total costs, amounting to $1.1 billion in higher costs (25% increase over the base case) for a 2025 closure, and $540 million higher costs (12.1% increase over the base case) for a 2035 closure. *See* 2023 IRP, Exhibit B-1, Section 8.9. Moreover, these scenarios rely on substantial purchases of power at market rates, in excess of $50 million each year commencing with Colstrip's closure. *Id.* As explained in Sections 4 and 5, there is substantial uncertainty whether such large market purchases can even be consistently executed and delivered, especially during peak load events. Consequently, the 2025 and 2035 closure scenarios are accompanied by worrisome grid stability and service interruption hazards.

These risks are sufficiently high that NorthWestern would need to closely examine embarking on an emergency program to construct replacement thermal capacity. On the timeframes contemplated by the Proposed Rule, the only thermal capacity that could feasibly implemented is natural gas fired capacity. The net effect would be to replace relatively short-lived (approx. 10-20 year life) coal-fired thermal capacity with new, long-lived (30+ year) natural gas capacity. Although natural gas has a lower carbon and MATS profile than coal, this tradeoff would clearly appear to be inconsistent with the long term objectives of E.O. 13990.

9. Rate consequences of the Proposed Rule Costs and impracticality of rate recovery

NorthWestern currently plans to invest over $2.4 billion in capital outlays over the next five years. Many of these investments are required by law. Others are intended to improve system reliability, better utilization of renewables, or other projects (e.g., wildfire mitigation) with demonstrable and significant environmental benefits.

Proposed Rule Costs would constitute significant increase in capital commitments, weighted toward the earlier part of the five years and could imperil NorthWestern's ability to make those critical investments.

Any rate increases to cover Proposed Rule Costs would be on top of other recent rate increases funding the existing capital and operational budgets. Presently pending before the MPSC is a 28% residential electricity rate settlement, driven in material part by NorthWestern's investments in carbon free and reduced-emissions projects. Proposed Rule Costs did not factor into the settlement. NorthWestern believes it is uncertain that the MPSC would approve cost recovery for such a large new increase on top of other recent increases, and may not approve any portion of it.

As a result, the most likely outcome of the Proposed Rule and Proposed Rule Costs would be to force NorthWestern to evaluate postponing or abandoning previously approved capital projects.

10. Consequences of diverting capital to comply with the Proposed Rule

As should be clear from the preceding discussion, it is unlikely that NorthWestern could feasibly comply with the Proposed Rule by either building replacement thermal capacity or by attempting to recoup the Proposed Rule Costs through rate increases, and early closure of Colstrip likely poses unacceptably high market and grid stability risks. This leaves a re-allocation of previously committed capital outlays as the most likely compliance scenario.

As discussed, a large fraction of the planned investments are focused on improving grid reliability, and upgrading existing renewables. Other projects (e.g. wildfire mitigation) have clear environmental benefits. NorthWestern had intended to perform a more detailed examination of potential capital program consequences of the Proposed Rule, had it been granted the requested extension of time to comment. Because that request was denied, NorthWestern can only hypothesize in more general terms.

The adverse net environmental consequences of capital reallocations from the subjects identified above should be obvious. The collective effect would be reduced utilization of renewables, slowing NorthWestern's progress toward its Net Zero 2050 objectives. Perversely, a very plausible scenario under the Proposed Rule, if implemented in its current form, would be to *extend* the life of Colstrip, and result in NorthWestern utilizing Colstrip *more heavily* than in the absence of the Proposed Rule. NorthWestern has not had the opportunity to fully calculate the emissions consequences, but there is a significant likelihood that, as applied to Colstrip, the Proposed Rule would have the effect of *increasing* net carbon and HAPS emissions over Colstrip's remaining life than if Colstrip is exempted from the Proposed Rule. Such a result would certainly be contrary to the objectives of E.O. 13990.

11. Prejudice to NorthWestern of the Proposed Rule

NorthWestern has been materially and uniquely prejudiced by the Proposed Rule. The 2023 RTR acknowledges that Colstrip will require far more extensive and expensive capital investments than any other facility subject to the Rule. RTR at 9. Indeed, the entire rationale for the Proposed Rule – that existing EGUs can attain additional emissions reductions at minimal cost – does not apply to Colstrip.

As revealed in the 2017 and 2019 ERPP's and 2020 ERPP supplement, NorthWestern did not plan for the Proposed Rule and Proposed Rule Costs, because it had no reason to anticipate them. As a result, NorthWestern made major capital commitments to improve integration of renewables, grid reliability, and transmission capacity. These all advance NorthWestern's progress toward Net Zero 2050. But these investments depended critically on the assumption that Colstrip would remain an essential component of NorthWestern's portfolio through approximately 2042, and that major new emissions controls to address mercury and HAPS would not be necessary given Colstrip's compliance with the performance objectives of the original MATS rule, the regional haze rule, and the statutory standards in the Clean Air Act. The Proposed Rule (as well as other regulatory initiatives detailed by Talen) would upend these assumptions.

NorthWestern also notes that the Proposed Rule, in combination with the other proposed rules, disincentivizes superior performance. As detailed by Talen, the venturi scrubbers control both sulfur dioxide and fPM. Colstrip has been a high performer in SO_2 emission reduction for years because of that system, but under the Proposed Rule Colstrip would be punished for having "wrong" system to control fPM, in comparison to other facilities.

No other utility bears anywhere close to the burden that NorthWestern would bear under the Proposed Rule. And, because Colstrip essentially serves only Montana, no other State would bear anywhere close to the burden that Montana electricity customers would bear.

12. Statutory and Administrative Procedure Act deficiencies with the Proposed Rule

The Proposed Rule is unlawful under Clean Air Act Section 112(d)(6). That Section provides that EPA must take into account "developments in practices, standards, and control technologies" in determining whether a revision in standards is necessary. EPA purports to satisfy this requirement by citing to performance data from 2017 to 2021, and opining that facilities have performed better and at lower costs than anticipated when the MATS Rule was promulgated in 2012. But this dataset is selective and misleading. All the performance and cost metrics EPA now relies on were known to EPA when it released the 2020 RTR. EPA has withdrawn its prior "Appropriate and Necessary" determination, but it has not withdrawn the 2020 RTR. As a result, the 2023 RTR is *not* based on "developments in practices, standards, and control technologies" since the prior

RTR, but rather only a *change in policy* regarding the *same* practices, standards, and control technologies.

Basing revised standards simply on a policy reversal is contrary to the text and structure of Section 112(d)(6), especially when coupled with the tight statutory compliance deadlines provided in Section 112. The Clean Air Act envisions that both EPA *and* the regulated community would be able to monitor evolving trends in emission control technologies and practices, such that regulated could see and plan for potential upgrades that might be needed on the horizon. But when EPA reverses course based on policy, not technological changes, regulated entities do not have similar advance notice when planning capital programs. This is contrary to the statute.

The Proposed Rule's statutory deficiencies are compounded by its proxy-on-proxy structure, where PM (a pollutant independently regulated under the NAAQS program) is used as a stand-in for HAPS. NorthWestern understands the technical rationale for focusing on PM rather than attempting to measure HAPS directly, but the indirectness of the regulation is problematic given the history of the Rule. Moreover, it will not be lost on a reviewing court that the Proposed Rule is a transparent attempt to indirectly regulate greenhouse gas emissions in the immediate wake of *West Virginia v. EPA*, 142 S.Ct. 2857 (2022). For that reason, and because of its severe impacts to Montana and the reliability of the Western Interconnection, there is a significant likelihood that a court will subject the Rule to scrutiny under the Major Questions Doctrine. It is doubtful that EPA's departures from the text and purposes of Section 112(d)(6) would survive such scrutiny.

Independently of statutory and constitutional infirmities, the Proposed Rule is also arbitrary and capricious under the Administrative Procedure Act. In addition to the reasons articulated by Talen, the Proposed Rule and 2023 RTR takes the same practices, standards, and control technologies as were examined in the 2020 RTR, and reaches a polar opposite conclusion. This is textbook arbitrariness. At a minimum, the fact that EPA has reversed course so completely in such a short timeframe likely deprives EPA of any judicial deference it might otherwise have enjoyed. Given the unprecedented methods deployed in the Proposed Rule to determine that the Rule would result in positive net benefits, there is a significant likelihood that the Proposed Rule, if finalized, would be invalidated under the APA.

13. Requests

As a result of the foregoing general deficiencies in the Proposed Rule and specific injuries to NorthWestern, NorthWestern respectfully requests the following actions. These are consistent with the concurrent requests by Talen.

(A). EPA should abandon the Proposed Rule until technological developments that warrant a new RTR have occurred

As explained above, the Proposed Rule is unlawful. As a result, and because of the significant prejudice and injury NorthWestern will suffer, EPA should withdraw the Proposed Rule until such time as a revised form of the Rule can be justified, if at all, by advancements in practices, processes, or control technologies, as envisioned by Section 112(d)(6).

(B). If rulemaking proceeds, EPA should create a subcategory exempting facilities with wet scrubbers only

In the event the Proposed Rule is finalized, at a minimum the Final Rule should create a subcategory for those facilities that employ wet scrubber control technologies without additional ESP or fabric filter controls, and exempt them from the Proposed Rule. The rationale of the Proposed Rule is that significant performance improvements can be obtained through minimal equipment upgrades and costs, and that is plainly not true of facilities that only employ wet scrubbers without additional controls. Therefore such facilities should be subject to subcategory treatment and exempted.

(C). If rulemaking proceeds, EPA should also create an opt-out option for facilities that decide, within one year of the publication of the Final Rule, to enforceably commit to closure by December 31, 2035.

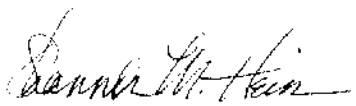
If the Final Rule does not create an exempt subcategory for facilities with wet scrubbers alone, EPA should create a retirement subcategory allowing units to continue to meet the existing 0.03 lb/MMBtu fPM standard so long as they opt-in to the retirement subcategory within 18 months after finalization of the rule, with a retirement date no later than December 31, 2035 (and where continued operation after 2035 would later be permitted if (i) the unit is essential to maintain regional grid reliability, as determined by the Western Regional Adequacy Program, Regional Transmission Organizations, Independent System Operators, North American Electric Reliability Corporation, or other similar system reliability authorities; or (ii) or if EPA determines that additional time is required to allow the unit to transition to renewable or clean energy generation). This would provide units another compliance option and needed flexibility.

This timeline is also necessary in NorthWestern's case because of the prejudice NorthWestern has experienced in the development of the Proposed Rule, and the long-lead time needed for closure and planning and construction of replacement baseload capacity. Such a timeline will also maximize the likelihood that replacement capacity will be carbon-free rather than fossil fuel-based. In its deliberations, EPA must consider net environmental and environmental justice consequences over all time scales, rather than only short term objectives. This is both consistent with the law and the objectives of Executive Orders 12898 (as updated) and13990.

Conclusion

NorthWestern is disappointed that the Proposed Rule in its current form does not achieve its intended objectives, and that NorthWestern was deprived of the opportunity to submit additional useful information by EPA's denial of NorthWestern's extension request. Nevertheless, NorthWestern's strong carbon-free portfolio performance and Net Zero 2050 commitments demonstrate that it shares many of the Administration's long term environmental objectives. NorthWestern is available to further discuss the consequences of the Proposed Rule and potential solutions to the problems it poses. If you have any questions regarding these comments, or would like to further engage on the subject, please contact me at 406-443-7969 or shannon.heim@northwestern.com.

Sincerely,



Shannon M. Heim
Vice President and General Counsel
NorthWestern Energy

Exhibit 3

Lebsack Declaration

Including:

- Attachment A: Select excerpts of Burns & McDonnell Study
- Attachment B: Declaration of Dale E. Lebsack, Jr. in the GHG Rule litigation
- Attachment C: Economic study by Dr. Patrick M. Barkey, Ph.D.

DECLARATION OF DALE E. LEBSACK, JR.
IN SUPPORT OF PETITIONERS' MOTION TO STAY FINAL RULE

I, Dale E. Lebsack, Jr. hereby declare and state under penalty of perjury that the following is true and correct to the best of my knowledge and is based on my personal knowledge or information available to me in the performance of my official duties.

INTRODUCTION

1. My name is Dale E. Lebsack, Jr., and my business address is 1725 Hughes Landing Boulevard, Suite 800, The Woodlands, Texas 77380. I am over the age of 18. I have personal knowledge of the subject matter and am competent to testify concerning the matters in this Declaration.

2. I currently work as President of Talen Montana, LLC ("Talen Montana") and as Chief Fossil Officer for Talen Energy Corporation ("Talen Energy"), its ultimate parent company. As President of Talen Montana, I am responsible for the day-to-day executive management of Talen Montana's business, properties, and operations.

3. I have worked for Talen Energy and its predecessor companies for over 19 years. Over that time, I have had roles of increasing responsibility in multiple aspects of fossil power generation, including asset management, plant operations, engineering, environmental, health and safety, and project development. This

Declaration is based on my personal knowledge as President of Talen Montana and Chief Fossil Officer of Talen Energy, and analyses conducted by my colleagues.

4. I am submitting this Declaration in support of Petitioners Talen Montana and NorthWestern Corporation d/b/a NorthWestern Energy's Joint Motion to Stay the U.S. Environmental Protection Agency's ("EPA" or "Agency") final rule titled "National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review," commonly referred to as the Mercury and Air Toxics Standards ("MATS"). 89 Fed. Reg. 38508 (May 7, 2024) ("MATS Final Rule").

5. I am familiar with Talen Montana's operations, including generation, regulatory compliance, workforce management, and electric markets in general. I also am familiar with the MATS Final Rule, and I am familiar with how the MATS Final Rule will affect Talen Montana. Additionally, I am familiar with EPA's greenhouse gas rule, 89 Fed. Reg. 39798 (May 9, 2024) ("GHG Rule"),[1] as described below.

6. Talen Montana has economic interests in coal-fired units that will be subject to the MATS Final Rule.

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[1] *See* New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule, 89 Fed. Reg. 39798 (May 9, 2024).

7. Talen Montana is the operator of Units 3 and 4 at the Colstrip Steam Electric Station, commonly referred to as Colstrip Power Plant ("Colstrip"), in Rosebud County, Montana. Talen Montana also has a 15 percent economic interest in these units, which currently consist of two active coal-fired generating units capable of producing up to 1,480 net MW of electricity that have been operating for approximately 38 years.

8. Each of the units has approximately 740 MW of net generating capacity, and the adjacent Rosebud coal mine supplies Colstrip's low-sulfur subbituminous coal. Units 3 and 4 are the only remaining active units at Colstrip, as Units 1 and 2 recently retired in 2020. Units 3 and 4 have a useful life of at least another two decades, provided investments continue to be made for equipment maintenance and replacement as necessary.

9. Colstrip is one of the largest coal-fired electric generating facilities west of the Mississippi River, supplying electricity throughout Montana and the Pacific Northwest. Colstrip plays an integral role in maintaining operation of the NorthWestern Balancing Authority in Montana, especially during peak electricity demand events.

10. The MATS Final Rule sets forth aggressive compliance timelines for demonstration of compliance with EPA's new and more stringent filterable particulate matter ("fPM") emission limit—requiring that these upgrades be made at

Colstrip by July 8, 2027. As discussed below, compliance with the MATS Final Rule is anticipated to cost more than $350 million at Colstrip, with $15 million in additional annual operating costs.

Summary of Key Points

11. In this Declaration, I make the following points:

a. The MATS Final Rule requires Talen Montana and the Colstrip owners to make immediate decisions that will either lead to the installation of extremely costly pollution controls on Colstrip or a premature retirement. If the MATS Final Rule is not stayed, this irreversible decision will be made prior to the conclusion of this litigation. Massive costs for compliance with the MATS Final Rule will be expended unnecessarily if the MATS Final Rule is not upheld on appeal. Moreover, the consequences of early closure of Colstrip on Montana and its local economy are known, measurable, and severe.

b. Colstrip's six owners are split between two intrinsically different business models (i.e., utilities regulated by different state commissions, versus, in Talen Montana's case, a merchant generator), which impacts their business objectives, financial priorities, and motivations for evaluating whether to support installing mandatory but costly controls under the MATS Final Rule.

c. Each of Colstrip's six owners have differing regulatory landscapes and state policy considerations (i.e., owners situated in states that want

to minimize coal-fired power versus those that are not), which further impacts their unique priorities and considerations for deciding whether to install costly controls under the MATS Final Rule.

d. The differing positions among Colstrip's owners are significant, suggesting that compliance with the MATS Final Rule will be extremely contentious absent a stay, while a stay would allow for rational decision-making about Colstrip's future.

e. Absent a stay, installation of new emissions control systems will be extremely expensive—and potentially cost prohibitive—for Colstrip. Such high costs may lead to the premature retirement of Colstrip by the MATS Final Rule's compliance date of July 8, 2027, with a decision to retire made long before litigation over the rule is completed.

f. EPA's GHG Rule, if not overturned, will force closure of Colstrip by the end of 2031, significantly limiting the time to recoup investments to comply with the MATS Final Rule.

g. Absent a stay, it is almost certain that significant time and resources will be dedicated to addressing disputes over the expenditure of funds for compliance with the MATS Final Rule.

h. Absent a stay, compliance efforts with the MATS Final Rule would need to begin essentially immediately—extremely challenging given

Colstrip's unique ownership structure. Talen Montana has already begun the process of expending funds to study the compliance options and timelines, and millions of dollars will be required to continue engineering and design efforts later this year, ramping up further next year as construction would need to begin.

i. Per the above points, Talen Montana will directly experience material irreparable harm.

These points are discussed in further detail in the remainder of this Declaration.

TALEN MONTANA AND COLSTRIP OWNERSHIP

12. Talen Energy is an independent power producer that owns and operates approximately 10.7 gigawatts of power infrastructure in the United States. Talen Energy (through its subsidiaries) produces and sells electricity, capacity, and ancillary services into wholesale U.S. power markets, including PJM Interconnection, LLC ("PJM") and the Western Electricity Coordinating Council ("WECC"), with Talen Energy's generation fleet principally located in the Mid-Atlantic and Montana. Talen Energy's generation fleet includes wholly owned and partially owned assets that use nuclear, coal, oil, and natural gas as fuels.

13. Talen Montana is one of six owners, and is the operator, of Colstrip.

Each of Colstrip's six owners have differing business models, which impacts their priorities and considerations for deciding whether to install required costly controls under the MATS Final Rule and will complicate and lengthen the decision-making process.

14. Unlike traditional regulated utilities,[2] which have a process for recovering certain costs through electricity rates, Talen Montana is a "merchant power producer." Talen Montana sells power from Colstrip into the wholesale market.

15. Thus, Talen Montana has no "captive ratepayer." While regulated utilities have a set customer base, Talen Montana does not, as its wholesale customers have access to an open market. The market and its participants can always favor a different electricity producer if Talen Montana's power production costs are too high. Additionally, unlike regulated utilities that may be able to recover capital expenditures for new pollution controls through rates, Talen Montana cannot pass on such costs to its customers through rate adjustments.

16. Rather, Talen Montana is subject to market rates for its electricity and must rely on those market prices to pay for any new capital expenditures. Such prices may not reflect the additional costs incurred. The need for substantial upfront investment can put strains on financial resources and expose the company to risks.

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[2] Utilities, such as investor-owned utilities or public utilities, operate under a highly-regulated framework where the utility company owns the generation and transmission necessary to serve its end-use customers and manages the system operations to serve its customers. These utilities are regulated by state utility commissions. Such regulation typically includes the setting of rates that are intended to allow the utility to recover a reasonable rate of return on its investments. Thus, a regulated utility may (or may not) be able to recover through rates the costs for installing facility upgrades (such as pollution control equipment under the MATS Final Rule), dependent on the approval of state regulators.

17. Market prices for electricity may be volatile and are driven by factors such as supply and demand, fuel costs, and weather conditions. When electricity prices are low, it is more challenging to recover the costs of new capital investments like pollution controls. Because the company must absorb the financial burden of these capital expenditures, with no certain ability to pass the costs onto consumers, this can erode or eliminate profit margins.

18. Additionally, given that market prices for electricity fluctuate and are difficult to predict into the future, this complicates Talen Montana's ability to manage for and recoup investments in pollution control equipment, which in turn makes it difficult to plan for long-term investments.

19. Thus, while Talen Montana must undertake an economic analysis of the risks of installing controls in light of predicted market sales of wholesale power in the period after installation of controls, the other owners must deal with their regulatory commissions to determine whether such costs would be permitted to be passed on to end users, and some owners may choose not to undertake that process at all. In sum, the different structure of the Colstrip owners means that there are different financial motivations, risks, and other considerations for deciding whether to install costly controls that will inevitably lead to delays in the decision-making process.

Each of Colstrip's six owners have differing ownership interests and state regulatory considerations, which further impacts their unique

priorities and considerations for deciding whether to install required costly controls under the MATS Final Rule.

20. As noted above, Talen Montana is one of six owners, and each of these owners have different ownership interests. Colstrip Units 3 and 4 are co-owned by Avista Corporation ("Avista"), Portland General Electric Company, Inc. ("PGE"), Puget Sound Energy, Inc. ("PSE"), PacifiCorp (collectively, the "PNW Owners"), NorthWestern Corporation ("NorthWestern"), and Talen Montana.

21. All owners other than Talen Montana are traditional utilities governed by a state commission. Some are subject to regulations in multiple states. For example, laws passed by Oregon and Washington apply to the PNW Owners.

a. Oregon passed a statute in 2016 that bars utilities from supplying coal-fired electricity to certain Oregon retail customers after January 1, 2030.[3] Washington followed suit in 2019 by passing a statute that will impose substantial penalties on utilities who provide coal-fired electricity to certain Washington retail customers after December 31, 2025.[4] With respect to the Washington statute, the PNW Owners serving retail customers in Washington remain free to use coal-fired electricity subject to the statutory penalties. Oregon and Washington's clean energy laws discussed above may limit or discourage the PNW Owners' ability to use

[3] Or. Rev. Stat. §§ 757.518 and .519.

[4] Wash. Rev. Code §§ 19.405.030(1)(a), (4) and 19.405.090(1)(a)(i).

Colstrip to serve customers in Washington and Oregon, with those laws becoming effective in 2026 in Washington and 2030 in Oregon.

b. Unlike the PNW Owners, Talen Montana and NorthWestern are not subject to these regulations promulgated by the applicable utility commissions in Oregon and Washington.

22. The Colstrip units are governed by a 1981 ownership agreement. Each Colstrip Owner's respective ownership interest in Colstrip is as follows:

Owner	Unit 3	Unit 4
Avista	15%	15%
NorthWestern	--	30%
PacifiCorp	10%	10%
PGE	20%	20%
PSE	25%	25%
Talen Montana	30%	--

NorthWestern has agreed to acquire Avista's share as of January 1, 2026.[5]

23. Each of the regulated utility owners will evaluate compliance with the MATS Final Rule differently, largely because of their separate state's commissions and stakeholders and regulatory frameworks, i.e., laws in those states regarding use of electricity from coal fired power plants. Some owners, like NorthWestern, must engage with their respective public utility commissions to determine what action would have the least impact on grid reliability and electricity costs to customers,

[5] *See* Declaration by John D. Hines ("NorthWestern Decl.") at ¶¶ 8, 37, 68.

including whether to install controls (which could require extended outages for installation), or whether to seek early retirement and instead seek replacement generation.[6]

24. From Talen Montana's perspective, however, there is no current planned retirement date for Colstrip. And as a merchant power generator (described above), Talen Montana is not subject to any regulation by a state commission. Talen Montana's position on compliance with the MATS Final Rule will largely be driven by economic factors.

The differing positions among Colstrip's six owners are deep-rooted, suggesting that compliance with the MATS Final Rule will be extremely contentious absent a stay, whereas a stay would allow for rational decision-making about Colstrip's future.

25. The divergent interests of certain PNW Owners, on the one hand, and NorthWestern and Talen Montana, on the other hand, have led to disputes regarding the future of Colstrip and the owners' ability to close (or not close) the plant under the ownership agreement.[7] According to one filing, underlying disputes between

[6] *See id.* ¶¶ 18–32 (explaining that the MATS Final Rule will materially increase electricity-delivery costs in Montana, and it is uncertain whether those will be recoverable in electrical rates, and that NorthWestern anticipates significant resistance from the Montana Public Service Commission to the MATS Final Rule-based rate increases "given the magnitude of the costs, the short useful life of the controls, and the EPA's own findings that additional controls are not necessary to protect human health").

[7] *See* Decl. of Ronald J. Roberts in supp. of PSE Mot. for Relief from Automatic Stay, at 20, *In re Talen Energy Supply, LLC et al.*, No. 22-90054 (Bankr. S.D. Tex.).

Talen Montana and the PNW Owners regarding how and when to retire the remaining Colstrip units "originated over a decade and a half ago."[8]

26. Colstrip's owners continue to have divergent constraints when it comes to long-term planning for Colstrip's future. In fact, this very issue—Colstrip's retirement—has been litigated in a years-long dispute that has resulted in litigation and arbitration, and has even resulted in legislation passed by the Montana legislature.[9] The owners have long had different priorities regarding Colstrip's future and long-term planning, suggesting that issues regarding MATS Final Rule compliance will be contentious.

27. In addition to the impacts of the MATS Final Rule in the context of its 15% economic interest in Colstrip, Talen Montana will be further impacted by disputes among the owners regarding the MATS Final Rule due to its role as Colstrip's operator. As Colstrip's operator, Talen Montana is the "agent for and on

[8] *See* Debtors' Opp'n to Mot., at 7, *In re Talen Energy Supply, LLC et al.*, No. 22-90054 (Bankr. S.D. Tex.).

[9] *See, e.g., See Portland Gen. Elec. Co. v. Northwestern Corp.*, No. 1:21-cv-0047-BLG-SPW-KLD (D. Mont.). Senate Bill 266 applied to Colstrip's owners and made it a violation of law to fail or refuse to fund its share of operating costs, or to bring about permanent closure of a generating facility without seeking and obtaining consent of all owners. S.B. 266, § 2(2)(a), (b), 67th Leg., Reg. Sess. (Mont. 2021). Senate Bill 265 mandated three arbitrators unless all parties agreed to a single arbitrator. S.B. 265, § 1, 67th Leg., Reg. Sess. (Mont. 2021).

behalf of the Owners" and must construct, operate, and maintain Colstrip in accordance with Prudent Utility Practice.[10]

28. Given the differing business models and competing state regulatory considerations among the owners, Talen Montana—as operator—finds itself stuck in the middle from an economic perspective because, however Talen Montana interprets its duty as operator in this matter, it is likely to antagonize one or more of its co-owners. Additionally, as Colstrip operator Talen Montana has no independent source of funding. Talen Montana has only what is advanced or recovered from the

[10] This is stated in Section 3(b) of the Colstrip Units 3& 4 Ownership and Operation Agreement ("O&O Agreement"). In O&O Agreement Section 1(r):

> "Prudent Utility Practice" at any particular time means either any of the practices, methods and acts engaged in or approved by a significant portion of the electrical utility industry prior thereto or any of the practices, methods or acts, which, in the exercise of reasonable judgment in the light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at the lowest reasonable cost consistent with reliability, safety and expedition. Prudent Utility Practice shall apply not only to functional parts of the Project, but also to appropriate structures, landscaping, painting, signs, lighting, other facilities and public relations programs, including recreational facilities, and any other programs or facilities, reasonably designed to promote public enjoyment, understanding and acceptance of the Project. Prudent Utility Practice is not intended to be limited to the optimum practice, method or act, to the exclusion of all others, but rather to be a spectrum of possible practices, methods or acts. Prudent Utility Practice shall also include those practices, methods and acts that are required by applicable laws and final orders or regulations of regulatory agencies having jurisdiction.

other owners for operations, maintenance, and capital expenditures at Colstrip.[1] Hence, Talen Montana may bear the financial risk if a Colstrip owner chooses not to reimburse costs related to compliance with the MATS Final Rule.

29. The owners will always have disparate positions about installing costly controls to comply with the MATS Final Rule, which likely will lead to further contention between the owners if Talen Montana, NorthWestern, or others seek to install controls. Disputes between the owners have already begun to unfold over the costs of the preliminary analysis of possible compliance options.

30. Further disputes would at least be delayed and possibly rendered unnecessary if there is a stay of the rule.

31. Without a stay, existing disputes will almost certainly intensify and interfere with the ability to reach a timely consensus on the retirement of Units 3 and 4, burdening the companies' resources.

CONTROL REQUIREMENTS, IRRECOVERABLE COSTS, AND IMPLICATIONS

Absent a stay, installation of new emissions control systems will be extremely expensive—and potentially cost prohibitive—for Colstrip.

32. The MATS Final Rule may force Talen Montana to make a massive investment in new emissions control technologies that is difficult to justify even when considered without reference to other contemporaneous EPA rulemakings

[1] O&O Agreement Section 3(b), Articles 6 11.

(e.g., the GHG Rule). As noted above, the MATS Final Rule significantly tightens the surrogate fPM standard for demonstrating compliance with the emissions limits for non-mercury ("non-HG") metal hazardous air pollutants ("HAPs") from 0.03 lb/MMBtu to 0.010 lb/MMBtu, among other related requirements.

33. Colstrip cannot comply with the more stringent fPM limits in the MATS Final Rule with its current pollution control equipment. Colstrip must undertake a massive and complex construction project to install new controls—either fabric filters, known as baghouses, or electrostatic precipitators ("ESPs")—to come into compliance with the MATS Final Rule. Installation of these new emissions control systems will be extremely expensive and potentially cost prohibitive for Colstrip. If deemed cost prohibitive, the MATS Final Rule would require Colstrip to prematurely retire by the rule's compliance deadline of July 8, 2027, approximately three years from now. The decision to retire (or to install controls) would be made long before litigation over the MATS Final Rule is concluded.

34. Based on the latest information, the MATS Final Rule will require expenditures of over $350 million to install new fabric filters or ESPs, with the most likely option the installation of fabric filters between the plant's flue gas reheat system and the stack. In addition to the capital expenditure, the annual operation and maintenance cost is estimated to be approximately $15 million annually. *See*

Burns & McDonnell, *Colstrip Particulate Matter Control Cost Evaluation Final* (Apr. 2024) (select excerpt included as Attachment A to this Declaration). Talen Montana is continuing to work on cost estimates and preliminary engineering on the pollution control equipment necessary to comply with the MATS Final Rule.

Absent a stay, it is almost certain that significant time and resources will be dedicated to addressing disputes over the expenditure of funds for compliance with the MATS Final Rule.

35. It is anticipated that the project to install new baghouses would take 36–42 months (i.e., three years minimum) to complete. Given that timeline, preliminary investigation and engineering work must begin the summer of 2024 (following contracting for such work) with detailed engineering and design in the fall of 2024. If approved, on-site construction work, such as laying foundations, would begin in spring of 2025 but federal permitting hurdles, environmental reviews, and potential challenges (e.g., by environmental organizations) could cause project delays.

36. Work in the balance of 2024 is expected to cost millions, and by the end of the first quarter of 2025, material purchasing will begin and multiple contract awards will ramp up commitments and spending rapidly on a $350 million project.

37. Given the anticipated timeframe for engineering and construction, even if the project could begin in the fall of 2024, it will be a challenge to complete by the July 8, 2027 compliance deadline, and may still be tight for a compliance even

if granted a one-year deadline extension under the rule. Schedules continue to slip due to supply chain disruptions and material and labor shortages.

38. Given these aggressive time frames, the MATS Final Rule affords Talen Montana no time to wait before beginning efforts to comply with the rule. Absent a stay, Talen Montana must start immediately. Accordingly, the MATS Final Rule requires that Talen Montana and the other five Colstrip owners decide in a short timeframe whether to go down a path that will lead to the commitment of hundreds of millions of dollars on new pollution control equipment or a premature retirement.

39. Importantly, any decision to proceed with the project would most likely be made by the Colstrip owners acting through the Project Committee established in their ownership agreement. As noted above, disagreements between the owners about compliance expenses could lead to disputes under the ownership agreement or otherwise. Without a stay, significant time and resources will be devoted to these potential disputes. Moreover, given the tight compliance schedule noted above, Talen Montana, as Colstrip operator, and possibly others, could face the prospect of having to spend hundreds of millions of dollars in compliance costs with its ability to recover those costs from the other owners in dispute.

EPA's GHG Rule significantly limits the time to recoup investments to comply with the MATS Final Rule.

40. Talen Montana, as a merchant generator, must consider how much time is available to recoup the costs of the investment (i.e., how long can the unit operate after installation of controls to pay for those controls) when deciding whether to invest in additional pollution control equipment or to retire the units (equipment lifespan and recoupment time is also a relevant factor for regulated utilities).

41. While Colstrip has no set retirement date, EPA's concurrent finalization of the GHG Rule under Clean Air Act Section 111(d) raises the stakes for Talen Montana because it significantly limits the time to recoup investments required to comply with the MATS Final Rule.

42. Under the GHG Rule, Colstrip can only operate beyond December 31, 2031, if it co-fires with natural gas before 2030 or installs carbon capture and sequestration ("CCS") before 2032.

43. As I set forth in my declaration in support of a stay motion in the GHG Rule (included as Attachment B to this Declaration), Colstrip cannot install CCS before 2032 or co-fire natural gas before 2030. This means that to comply with the GHG Rule (if upheld on appeal), it must permanently cease operation by the end of 2031.

44. As a result, accounting for the interaction of the Final MATS Rule and the GHG Rule, Talen Montana would have only from July 8, 2027 (or later if controls take longer to install, which is certainly possible) through the end of 2031

to recoup its share of the massive costs involved in MATS Final Rule compliance. Again, as a merchant generator, Talen Montana has no method to recoup these costs aside from generating revenue through the sale of power on the wholesale market.

45. The annualized costs of those expenditures, when spread over only approximately four years of operation after installation (or even fewer, if the operational date of controls is later), are staggering. Assuming 4.5 years of operation after installation of controls, the annualized capital costs would be approximately $109 million/year with the same discount rate assumptions made by EPA; if controls are installed subject to a one-year extension, the annualized capital costs would be approximately $133 million/year.

46. Given the volatile nature of wholesale power prices, it is highly uncertain whether the revenues available to Talen Montana in that four-year period will be enough for it to recoup its costs. While wholesale power prices in the Pacific Northwest are robust at present, should they revert to levels experienced as recently as 2020, Talen Montana will struggle to generate a profit on its share of Colstrip even before the hundreds of millions of dollars in compliance-related capital expenditures and millions of dollars per year in additional operating costs. The level of annualized costs to comply with the MATS Final Rule may be cost prohibitive and lead to a premature retirement of Colstrip.

47. In addition to depending on wholesale power prices to remain robust during the four-year period, Talen Montana's ability to recoup its investment is dependent on Colstrip's ability to operate during that timeframe. The complex power generation equipment used at Colstrip units will need to be offline for maintenance from time-to-time. Should those maintenance outages extend beyond anticipated durations, or should they occur during periods of high prices, Talen Montana could miss out on the revenues necessary to recover its investment. The relatively short recovery period of only four years exacerbates this operational risk.

48. Additionally, the cost to achieve a small incremental improvement in fPM removed is enormous. Colstrip already achieves 99.6 percent reduction of fPM with its existing wet venturi scrubbers.[12] The MATS Final Rule would require

[12] Since Colstrip Units 3 and 4 began commercial operations in the mid-1980s, Colstrip has continuously improved its methods for controlling air pollution. Colstrip has typically been able to remain below the current MATS limit of 0.030 lb/MMBtu of fPM. Since 2018, Colstrip has hired consultants and engineers to explore ways to further enhance the efficiencies of the venturi wet scrubbers. This work has made the venturi wet scrubber emissions more stable. Additionally, Colstrip implemented additional measures to address combustion conditions to help ensure that combustion of the coal occurs in a manner that prevents the formation of small fly ash particles that are difficult to remove in the wet venturi scrubbers. Together, these and many other comprehensive efforts reflect upgrades available to be implemented to the Colstrip scrubber/combustion process to reduce fPM, which has enabled Colstrip since 2018 to achieve consistent compliance with the current 0.030 lb/MMBtu fPM limit with an adequate compliance margin. In 2022, based on stack tests, Colstrip's two units combined achieved approximately 0.022 lb/MMBTU fPM on an annual basis—well below EPA's limit prior to the promulgation of the MATS Final Rule.

Colstrip to install an additional level of fPM control, at a cost exceeding $350 million, to further reduce fPM control from 99.6 percent to approximately 99.8 percent.

49. Moreover, the interaction of the MATS Final Rule with the GHG Rule and appellate challenges to those rules injects significant regulatory uncertainty into Talen Montana's planning process. The interaction between these rules forces Talen Montana and its co-owners to make immediate and consequential decisions about Colstrip's future, all of which will have ramifications not just for Talen Montana, but for Colstrip, the State of Montana, its citizens, and beyond. This decisional uncertainty inflicts immediate significant harm on Talen Montana, especially given its role as Colstrip operator, and could be avoided with a stay of the Final MATS Rule.

50. With a stay in place, Talen Montana would be able to operate from a set understanding, instead of absolute uncertainty, leading to rational decision-making about Colstrip's future with Colstrip's other owners.

TALEN MONTANA'S IMMEDIATE, IRREPARABLE HARMS

Absent a stay, compliance efforts with the MATS Final Rule would need to begin essentially immediately, which would be extremely challenging given Colstrip's unique ownership structure.

51. Absent a judicial stay, Talen Montana would be immediately and irreparably harmed for at least two reasons. First, absent a stay, compliance efforts

with the MATS Final Rule would need to begin immediately. Indeed, Talen Montana has already begun the process of expending funds to study the compliance options and timelines, and millions of dollars will be required to continue engineering and design efforts later this year. Second, these compliance efforts would involve a significant ramp-up in resources (i.e., time, effort, and coordination) this year, leading to major construction activities beginning by Spring of 2025, all of which might prove unnecessary and unrecoverable if the MATS Final Rule is overturned on appeal.

52. These decisions have far-reaching implications on Colstrip, Talen Montana, and beyond.

53. Regardless of Talen Montana's own decision-making process, Talen Montana must coordinate with the other five Colstrip owners with disparate ownership interests. As described above, several of Colstrip's owners likely would not favor investments to comply with the MATS Final Rule; and disputes amongst the owners are likely in the near future absent a stay. As Colstrip operator, Talen Montana will not only be harmed by the costs of contesting the dispute among the owners, but could also face the prospect of having to pay significant costs for complying with the MATS Final Rule without any certainty that Talen Montana can recover those costs.

54. Additionally, litigating the MATS Final Rule in a normal course would likely take a minimum of two to three years. Talen Montana and the Colstrip owners must make immediate and consequential decisions about Colstrip's future, with ramifications for Talen Montana, Colstrip, the State of Montana, its citizens, and beyond. These decisions must be made in the face of significant uncertainty over the Final MATS Rule (and the GHG Rule) given ongoing litigation. As described above, this decision uncertainty inflicts immediate significant harm on Talen Montana. If the MATS Final Rule is not stayed, yet is ultimately reversed on appeal, Talen Montana will have suffered the irreversible harm of either closing the plant prematurely or spending its share of hundreds of millions of dollars on unnecessary controls, by the time the legality of the MATS Final Rule is determined.

The consequences of early closure of Colstrip on Montana and its local economy are severe.

55. Early closure of Colstrip would cause significant economic harms to the local area and Montana.

56. Colstrip is pivotal to Montana. Colstrip is a primary source of safe, reliable electricity for Montanans and provides significant economic benefits in the form of direct and indirect jobs, tax revenue, and economic development. The impact of the MATS Final Rule, should it result in the premature closure of Colstrip, will extend well beyond the plant, the Rosebud mine, and the local community.

Early closure would put Montana's electric reliability at risk and could negatively affect Montana's economy.

57. Aside from its role in providing affordable, reliable electricity, Colstrip makes significant economic contributions to the local, county, and state economy.

58. A 2024 study conducted by Dr. Patrick M. Barkey, Ph.D. on the potential economic implications of the MATS Final Rule for Montana's economy (included as Attachment C to this Declaration) found that, if Colstrip were to retire prematurely, in 2028 alone (the first full year of closure for the mine and Colstrip):

a. Montana would have more than 3,000 fewer year-round jobs.

b. Montana households would experience more than $240 million lost income (more than $203 million disposable, after-tax income).

c. Montana would lose over a billion dollars in economic output, generally defined as gross receipts of business and non-business organizations. Of note, this revenue loss is felt by every industry in the economy.

d. Montana would lose more than $102 million in State tax revenue.

59. The study's conclusions are corroborated by other key financial measures which I am familiar with.

60. Colstrip is a large part of Montana's tax base. Colstrip pays approximately $60 million in state, county, and local taxes annually, accounting for 90 percent of municipal and 75 percent of county tax revenue. Colstrip's owners

pay an average of $70 million per year in taxes just for the fuel component of Colstrip, which includes Federal and State Royalties and Severance Tax.

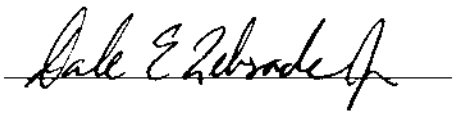
61. Colstrip's owners pay approximately $1.025 million per year directly to the Montana Department of Environmental Quality.

62. In short, Colstrip makes significant contributions to the State of Montana and is central to the State from an economic and social perspective.

CONCLUSION

63. For the reasons described above, Talen Montana is facing imminent and substantial harm if the MATS Final Rule is not stayed.

Executed on June 27, 2024,



Dale E. Lebsack, Jr.
President of Talen Montana, LLC
Chief Fossil Officer for
Talen Energy Corporation

Attachment A

to

Declaration of Dale E. Lebsack, Jr., President of Talen Montana, LLC and Chief Fossil Officer for Talen Energy Corporation

Select excerpts of Burns & McDonnell Study

CONFIDENTIAL

Colstrip Particulate Matter Control Cost Evaluation – Final

prepared for

Talen Montana
Colstrip, Montana

April 2024

Project No. 163860

prepared by

Burns & McDonnell

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1.0 EXECUTIVE SUMMARY

Burns & McDonnell has been retained to assess the cost of two particulate control options located between the reheat system and the stack to meet the proposed Mercury and Air Toxics Standards (MATS) Rule. The current system is compliant with the existing filter particulate limit of 0.030 lb/MMBtu. The proposed MATS rule would reduce this emission rate to between 0.006 and 0.010 lb/MMBtu. These rates cannot be achieved with the existing control technology or with modifications to the existing control technology. The primary objective of this evaluation is to provide an Association for the Advancement of Cost Engineering (AACE) Class 4 capital cost estimate, and an Operations and Maintenance (O&M) estimate incorporating site specific factors such as considering the power source for the new control system.

Burns & McDonnell evaluated the application of an Electrostatic Precipitator (ESP), or a fabric filter installed after the reheat system but prior to the stack. These options and placement in the flue gas path were selected in the previous Burns & McDonnell evaluation comparing various control technologies and installation locations. The previous study was an AACE Class 5 estimate that is primarily used for comparing relative options. This evaluation has included Colstrip site specific factors to help separate the two leading control options.

1.1 CAPITAL COST ANALYSIS

Burns & McDonnell requested vendor budgetary cost estimates for the ESP and fabric filter. Burns & McDonnell also requested a budgetary cost estimate for the ash handling system. The remaining equipment was estimated either using recent pricing from other projects or internal estimating tools. The vendor estimate for the ESP and fabric filter are supply and install estimates. The remaining equipment was estimated using manhours estimated internally and Union labor rates from RS Means for Montana.

Using this information capital, and O&M costs were then developed for both control technologies. The Total Project Cost is based on the assumption the project will be executed on a multiple contract, lump sum construction bid approach. The total costs do not include Owner's costs such as taxes, allowance for funds during construction, fees, permitting and Owner's contingency. Table 1-1 provides a summary of the two unit total capital costs.

Table 1-1: Summary of Capital Costs for Units 3&4

CAPITAL COST ESTIMATE
TALEN MONTANA
COLSTRIP POWER STATION
FABRIC FILTER AND ESP
COLSTRIP, MT
BMcD #163860

Area / Discipline	REHEAT FABRIC FILTER	REHEAT ESP
Engineered Equipment	$102,894,000	$86,794,000
Civil, Structural & Architectural	$128,820,000	$260,179,000
Mechanical	$7,270,000	$34,888,000
Electrical & I&C	$9,596,000	$10,542,000
Total Direct Cost	**$248,580,000**	**$392,403,000**
Engineering, Start-up, Commercial	$34,065,000	$54,012,000
Escalation	$14,377,000	$27,520,000
Contingency	$59,404,000	$94,787,000
Construction Management	Not Included	Not Included
EPC Fee	Not Included	Not Included
Total Indirect Cost	**$107,846,000**	**$176,319,000**
Total Project Cost	**$356,426,000**	**$568,722,000**
Owner Cost - General, Taxes & Fees	Not Included	Not Included
Owner Cost - Owner Contingency	Not Included	Not Included
Total Project Cost Incl. Owner Cost	**$356,426,000**	**$568,722,000**

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BURNS McDONNELL

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A percentage of the direct costs are included for Engineering, Start Up and Commercial costs. An overall project contingency, 20% of the direct and indirect costs, is included in the indirect costs. The Escalation is based on the project starting in the fall of 2024 and the second unit coming on line 42 months later. An annual escalation rate of four percent (4%) on engineered equipment, five percent (5%) on materials and four percent (4%) on labor and subcontracts has been included.

1.2 O&M COST ANALYSIS

Table 1-2 provides a summary of the two unit estimated operation and maintenance costs for each option.

Table 1-2: Summary of O&M Costs for Units 3&4

Reheat ESP	$19,820,000	$1,265,000	$21,085,000
Reheat fabric filter	$12,629,000	$2,157,000	$14,786,000

Table 1-3 provides a summary of all the capital and O&M costs plus the cost per ton of particulate removed. Items such as Owner's costs (performance bond, Owner's contingency, and taxes), permitting, funds during construction, are not included. The cost per ton of particulate removed is based on the annual levelized costs and tons of particulate removed from the average historical Colstrip emission rate. Total tons of material collected will likely exceed this amount as it is anticipated the particulate exiting the scrubbers will increase when the pressure drop across the scrubber is decreased to allow for the new control device.

Table 1-3: Particulate Control Cost Summary

Summary of Particulate Emissions Control Costs from Colstrip Units 3&4									
	PM	Emissions				Economic Impacts			
PM-10 Control Alternative (Ranked by PM-10 Rate)	Removal Efficiency %	Emission Rate lb/MMBtu	Hourly Emission Lbs/Hr	Annual Emission Tons/yr	Emission Reduction Tons/yr	Installed Capital Cost $1,000	Annual O & M Cost $1,000	Total Annual Cost $1000/yr	Average Control Cost $/ton
Reheat ESP	71.45	0.006	95	355	890	568,722	21,085	88,546	99,536
Reheat fabric filter	71.45	0.006	95	355	890	356,426	14,786	57,065	64,148
2022 Baseline (Scrubber)		0.0220	334	1245		N/A	N/A	N/A	N/A

Based on this evaluation the recommended MATS compliance approach for Colstrip Units 3 and 4 is the installation of fabric filters between the flue gas reheat system and the stack. The AACE Class 4 capital cost estimate for both units is a total of $356,426,000 (not including Owner's costs). The levelized annual operation and maintenance of the fabric filter option is $14,786,000 including the addition of a one full time equivalent staff member and 5-year bag replacement cycles. It is anticipated this project will take 36-42 months to complete depending on available outage windows. The anticipated tie in outages are 10 to 12 weeks for Unit 3 and 4 to 6 weeks for Unit 4.

* * * * *

2.0 INTRODUCTION

2.1 COLSTRIP STEAM ELECTRIC STATION

Talen Montana's operates the Colstrip Steam Electric Station in Colstrip, Montana. Units 3 and 4 are each 805 MW coal-fired steam electric generating units and were placed into service in 1984 and 1986, respectively. The units fire a low-sulfur PRB coal. The Colstrip units have particulate scrubbers installed for control of particulates and SO_2. Units 3 and 4 achieve a particulate matter emission rate of approximately 0.022 lb/mmBtu.

The EPA proposed updates to the MATS rule in May 2023. The current rule allows filterable particulate matter (fPM) emission rates of 0.030 lb/MMBtu as a surrogate for acceptable total non-mercury metal hazardous air pollutants (HAPS) emissions. The proposed MATS rule update could reduce this emission rate to as low as 0.006 lb/MMBtu.

A Phase 1 evaluation of several options to reduce fPM emissions at the facility to achieve compliance with the proposed updated MATS identified two compliance options for further evaluation. These options are installing an ESP or fabric filter downstream of the scrubbers and flue gas reheaters. This report presents the results of this further investigation including an AACE Class 4 cost estimate using budgetary quotations from major equipment suppliers. During the Phase 1 evaluation it was noted it is likely an electrical upgrade will be necessary as the plant cannot support the demand for a new ESP. This cost estimate has accounted specifically for this matter as well as other Colstrip specific factors.

2.2 COST DEVELOPMENT

Historically, a Class 4 study would utilize past project information and adapt that information to better fit the unique conditions at a specific site. However, over the last ten years the utility air pollution control market has seen a significant slowdown making past project data either limited or less relevant. To improve the accuracy of the cost estimate Burns & McDonnell contacted vendors that have remained active in the ash conveying and particulate control market either with utilities or at a scale akin to utilities. Southern Environmental Inc, and Industrial Accessories Company are the two companies Burns & McDonnell requested provide budgetary cost estimates for fabric filter. Southern Environmental Inc was also requested to provide a budgetary cost estimate for an ESP. UCC Environmental was contacted for budgetary pricing for the ash handling system.

The cost estimate addressed other equipment such as transformers, control cabinets, silos utilized cost information from more recent projects with these types of equipment. Commodity items such as steel, ductwork, foundations, earth work, etc. were included through quantities developed by Burns & McDonnell or cost factors based on Burns & McDonnell's experience on these types of projects.

2.3 LIMITATIONS AND QUALIFICATIONS

Estimates and projections prepared by Burns & McDonnell relating to schedules, performance, construction costs, and operating and maintenance costs are based on our experience, qualifications, and judgment as a professional consultant. Since Burns & McDonnell has no control over weather, cost and availability of labor, material and equipment, labor productivity, construction contractor's procedures and methods, unavoidable delays, construction contractor's method of determining prices, economic conditions, government regulations and laws (including interpretation thereof), competitive bidding and market conditions or other factors affecting such estimates or projections, Burns & McDonnell does not guarantee that actual rates, costs, performance, schedules, etc., will not vary from the estimates and projections prepared by Burns & McDonnell.

* * * * *

3.0 EMISSION REDUCTION TECHNOLOGY DESCRIPTION

The two technologies evaluated further are the fabric filter (baghouse) and the electrostatic precipitator. This section describes these two control technologies that can be retrofitted to Colstrip to comply with the proposed MATS particulate emissions regulations. Both of fPM reduction technologies that are commercially available. However, neither of these technologies have previously been located at a utility in reheated flue gas downstream of a wet particulate scrubber.

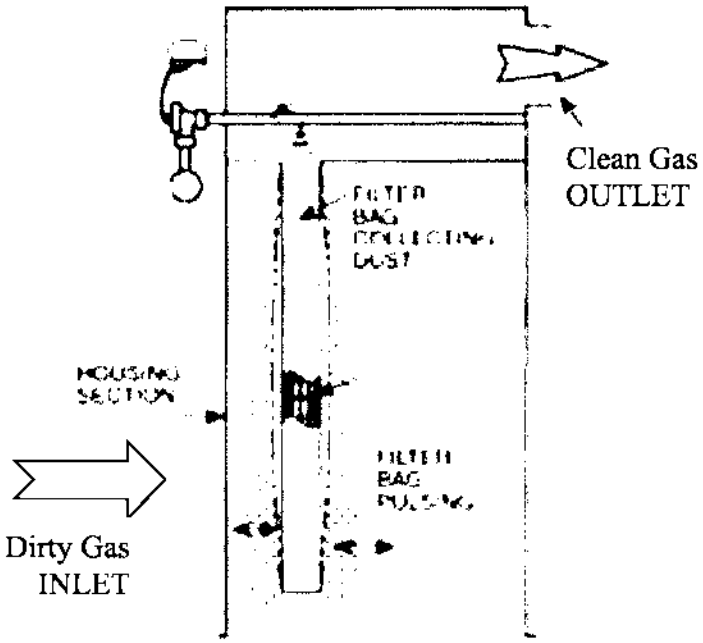
3.1 PULSE-JET FABRIC FILTER

A pulse-jet fabric filter is an effective particulate matter control technology that uses a fabric material to filter out particulate matter from flue gas. The use of filters to remove unwanted items from a system has been around for many centuries. Within the last century, fabric filters have been popular options for particulate control in coal-fired power plants. The process is simple, which is one reason why they are so common. There are multiple types of fabric filters, based on the cleaning method. The method discussed in this section is based on pulse-jet cleaning.

3.1.1 Process Description

A process flow diagram of a typical pulse-jet fabric filter system is provided in Figure 3-1

Figure 3-1: Typical Pulse-Jet Fabric Filter Process Flow Diagram



Pulse-jet fabric filters use the simple process of forcing the flue gas, which contains small particles, through a felted fabric. This process causes the particles to collect on the fabric, usually bags, by sieving. The material of the filter bags is determined by the operating conditions, namely the temperature of the flue gas. Also, the size of the filter bags is dependent upon the gas flow based on an air-to-cloth ratio, to avoid too great of a pressure drop from dust cake buildup.

As the dust cake buildup develops on the filter bags, they require cleaning. For pulse-jet fabric filters, the flue gas flows from outside the felted bags to the inside of the bags, and then the clean gas exhausts at the top of the bags. Therefore, the particles are collected on the outside of the bags. A wire cage is inserted inside the bags to prevent the bags from collapsing during normal operation. The bags are cleaned intermittently by pulse-jet cleaning, which is a short burst of high-pressure air directed at the top of the bag, which establishes a shock wave that proceeds down the bag. The wave-like vibration of the bag causes the particulate buildup on the outside of the bag to fall off the bags and into hoppers. As bags are periodically cleaned, the remaining bags take on the extra demand so that the system can continue to operate while bags are being cleaned. This also maintains a generally constant pressure drop across the system. After passing through the filter bags, the flue gas leaves the fabric filter free of almost all particulate matter.

3.1.2 Pulse-Jet Fabric Filter Advantages

Pulse-jet fabric filters have many advantages in comparison to other particulate matter control technologies:

- Brief cleaning pulse: The flow of flue gas through the bag does not have to be stopped during cleaning because the cleaning pulse is very brief, 0.03 to 0.1 seconds in duration.
- Constant pressure-drop: As some of the bags are being cleaned in the system the remaining bags take on the extra demand. This, along with greater frequency of pulse-jet cleaning, results in a nearly constant pressure drop across the system during operation.
- No isolation needed: Unlike other fabric filters, they do not need extra compartments to maintain necessary filtration because this method does not require isolated compartments of bags.
- Allows for higher gas flow rates and higher dust loadings: Since the pulse-jet cleaning is a very intense and frequent method, these fabric filters can treat higher gas flow rates and higher dust loadings than other fabric filters.
- Allows for smaller fabric filters: Since the pulse-jet cleaning method allows for higher gas flow rates and higher dust loadings, combined with dust cake buildup not being needed for efficient removal – the fabric filters can be smaller than other types of fabric filters in the treatment of the same amount of dust and gas, making higher air-to-cloth ratios possible.
- Uninhibited by gas stream fluctuations: These fabric filters are relatively insensitive to fluctuations in the flue gas stream conditions, so that efficiency and pressure drop are relatively unaffected by these fluctuations.
- Simple operation: Process is based on simple filtration, allowing for a simple operation.
- Simple maintenance: They do not require the use of high voltage, like ESPs do, which allows for simpler maintenance activities.
- Low and high resistivity collection: Fabric filters are effective at collecting particulate matter with either low or high resistivity, while ESPs have a difficult time collecting high resistivity ash.
- Flexible installation: There are many options for fabric filter configurations, allowing it to work for almost any plant set-up.

3.1.3 Pulse-Jet Fabric Filter Disadvantages

There are also various disadvantages to implementing pulse-jet fabric filters as the particulate matter removal technology:

- Ineffective for acid gas removal: Since the operation of fabric filters is based on filtration of solids, they are not effective at removing acid gases because the acid gases and some particulate matter are too small.
- Limited operation temperatures: If the temperature exceeds 550°F special refractory mineral or metallic fabrics are needed, which are expensive.
- Combustible hazard: If the dust being collected is readily oxidized, then the fabric material can burn.
- Relatively high maintenance: Fabric filters have relatively high maintenance needs because of bag replacement and cleaning method. Pulse jet filter bags require replacement more frequently than reverse gas filter bags.
- Dry environment: They do not operate in moist environments. So, they are limited to dry flue gas environments only. If the flue gas does not have sufficient reheat the bags could become wetted and likely require replacement. The proposed design includes bypass duct/dampers to avoid exposing the bags to flue gas during startup periods.
- Pressure drop: Some pressure drop is required for its functionality, around 8 to 10 in. w.c., which increases the load for the ID fan.
- High gas velocity problems: If the gas velocity is very high, then the dust can be drawn from bag to bag instead of falling into the hoppers, which causes the cake layer on the bags to become too thick. To prevent this, additional compartments are required which increases the capital cost.

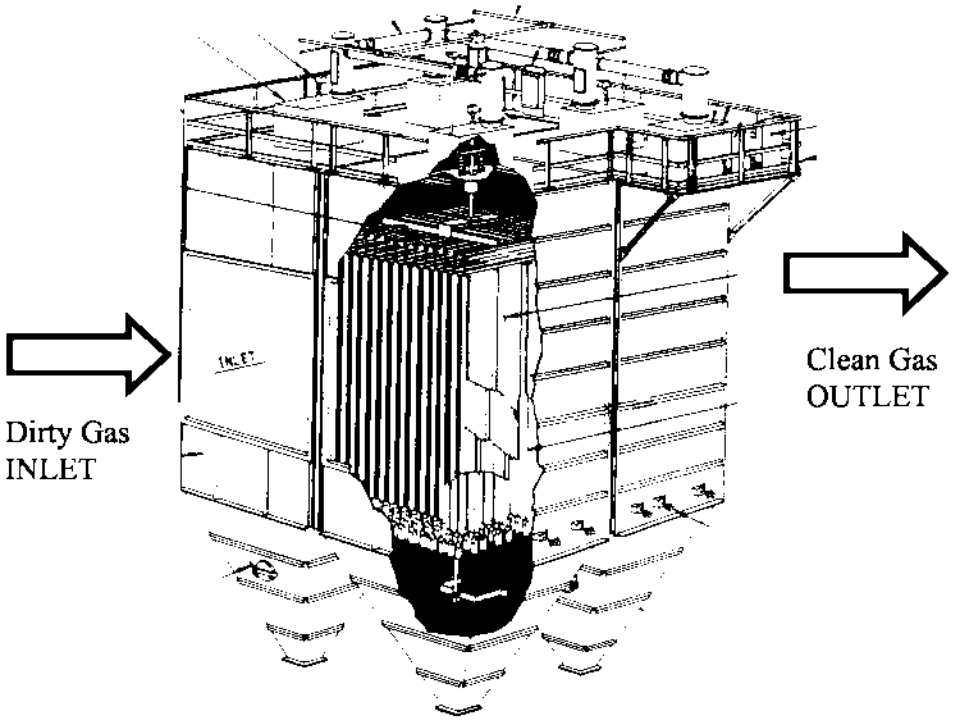
3.2 DRY ELECTROSTATIC PRECIPITATOR

An ESP is an effective particulate matter control technology that uses high voltage electric fields to collect particulate matter from flue gas. This technology is a well proven technology with decades of experience in utility applications. However, the nature of the particulate matter to be collected, specifically the electrical resistivity, can impair the operation of the ESP and the application of a dry ESP downstream of a scrubber on a coal fired boiler is unusual which could introduce unforeseen challenges.

3.2.1 Process Description

A process flow diagram of a typical ESP system is provided in Figure 3-3.

Figure 3-3: Typical Dry Electrostatic Precipitator Process Flow Diagram



ESPs offer an advantage of operating at a very low pressure drop across the system. The ESP is essentially a large box that slows the gas stream and uses an electrostatic attraction to collect the particulate. The ESP is arranged in a series of 'fields' which consist of negatively charged discharge electrodes and positively charged collection plates hanging in the gas stream. The discharge electrodes impart a negative charge to the particles in the gas stream. The negatively charged particles are then attracted to large positively charged plates. The particulate is collected on the plates and is periodically removed by "rapping" the plate. Most, but not all of the ash knocked off the plates will fall into the hoppers and will be removed by the ash handling system. Most of the particulate that is re-entrained in the gas stream during rapping is collected in subsequent sections of the ESP. Factors affecting the efficiency of the ESP include flue gas flow rate, resistivity of the ash, plate area, voltage and the number of fields.

ESPs are typically constructed of carbon steel and thus do not have significant corrosion resistance. In addition, the collection mechanism of the dry ESP requires dry particulate matter. If the collected materials were wet, the moisture would diffuse the induced charge and reduce the collection efficiency of the ESP. Also, wet materials would be difficult to dislodge from the collection plates, which would also

reduce collection efficiency. Therefore, dry ESPs are primarily filterable particulate collection systems intentionally operated under conditions that minimize condensation and collection of the resulting condensable particulate matter. Vendors indicate that guarantees for filterable emissions limits from an ESP are comparable to fabric filters.

3.2.2 Electrostatic Precipitator Advantages

An ESP is an efficient particulate matter removal device and has many advantages compared to other particulate matter control devices:

- Low pressure drop: An ESP only minimally hinders flue gas flow because of the lack of large obstructions in the flue gas resulting in a small pressure drop across the system.
- High removal efficiency: In a typical application they are capable of very high removal efficiencies of particulate matter removing between 99 and 99.9%.

3.2.3 Electrostatic Precipitator Disadvantages

There are also various disadvantages to an ESP compared to other particulate matter removal technologies:

- Very sensitive to gas flow: They are very sensitive to changes in flue gas stream conditions, so they are usually not suited for highly variable processes.
- Installation limitations: They are generally very large in order to obtain low gas velocities necessary for efficient removal, which causes problems when there is limited space for installation.
- Sophisticated maintenance requirement: They require relatively sophisticated maintenance personnel to operate and maintain because of the high voltages.
- Ozone production: During gas ionization, the negatively charged electrodes produce ozone.

* * * * *

4.0 EMISSION GUARANTEES

The typical location for either a dry ESP or fabric filter is immediately downstream of an air heater. This location is typical primarily due to the flue gas temperature in this location. The temperature after the air heater is much cooler than upstream but is still above the flue gas acid dew point (and well above the moisture dew point) during normal operation. The cooler temperature reduces the volume of the flue gas and thus the size/cost of the ESP and fabric filter but the temperature remains high enough to prevent liquid from condensing therefore protecting the ESP or fabric filter from liquid that could impact performance or reliability.

The application at the Colstrip facility is different from this typical configuration. The Colstrip units have a wet particulate scrubber that cools and saturates the flue gas while removing both particulate and sulfur dioxide. The existing system also includes a reheat system that warms the exiting flue gas and is designed to result in a dry flue gas. The proposed location for the new ESP or fabric filter is downstream of this reheat system and not in the typical location immediately downstream of the air heater. This location was selected in the previous study by Burns & McDonnell as the proposed location is a more cost-effective option. Due to the atypical nature of this design Burns & McDonnell made it a point to discuss this with the vendors to gain confidence the vendors would guarantee performance in this configuration.

In discussion with Southern Environmental Inc, they indicated that using either technology they are confident that both of the proposed MATS rates (0.010 or 0.006 lb/MMBtu) could be achieved, maintained, and guaranteed at the Colstrip facility. Preliminary discussions (not final) with Industrial Accessories Company indicated they are hesitant to commit to providing guarantees at Colstrip due to the fabric filter unusual application (gas path location).

Southern Environmental Inc is a long-term supplier of both ESP and fabric filter systems and has remained active in the large-scale market for these systems. Burns & McDonnell emphasized the importance of accurately stating if guarantees would be offered keeping in mind similar make right terms the Utility industry has historically required. Southern Environmental Inc acknowledged the point Burns & McDonnell was making and indicated they had considered that when stating the rates could be guaranteed.

* * * * *

5.0 COST EVALUATION

Included in this section of the report are the cost estimates for both control technologies evaluated for application at Colstrip. Both the capital cost and the O&M costs were estimated using vendor supplied budgetary cost estimates for the reheat fabric filter, reheat ESP, and ash handing systems. Burns & McDonnell in-house estimating software and tools were used to determine the supply and installation costs that were not otherwise supplied by vendors. Appendix B contains details from all the vendor quotations received.

5.1 CAPITAL COSTS

The Total Direct Costs (TDC) from Table 5-1 includes the capital costs plus balance of plant mechanical and electrical costs (i.e., ductwork, insulation, electrical upgrades, piping, etc.) and the cost for materials and labor required for installation. Total Project Cost in Table 5-1 includes the total direct costs plus indirect costs such as engineering, escalation, contingency, and other miscellaneous indirect costs. The Total Project Cost is based on the assumption the project will be executed on a multiple contract, lump sum construction bid approach. These costs do not include Owner's costs such as taxes, allowance for funds during construction, fees, permitting and Owner's contingency.

Additional details regarding what is included by the primary disciplines are outlined later in this section.

Table 5-1: Capital Cost Summary for Units 3&4

CAPITAL COST ESTIMATE
TALEN MONTANA
COLSTRIP POWER STATION
FABRIC FILTER AND ESP
COLSTRIP, MT
BMcD #163860

Area / Discipline	REHEAT FABRIC FILTER	REHEAT ESP
Engineered Equipment	$102,894,000	$86,794,000
Civil, Structural & Architectural	$128,820,000	$260,179,000
Mechanical	$7,270,000	$34,888,000
Electrical & I&C	$9,596,000	$10,542,000
Total Direct Cost	**$248,580,000**	**$392,403,000**
Engineering, Start-up, Commercial	$34,065,000	$54,012,000
Escalation	$14,377,000	$27,520,000
Contingency	$59,404,000	$94,787,000
Construction Management	Not Included	Not Included
EPC Fee	Not Included	Not Included
Total Indirect Cost	**$107,846,000**	**$176,319,000**
Total Project Cost	**$356,426,000**	**$568,722,000**
Owner Cost - General, Taxes & Fees	Not Included	Not Included
Owner Cost - Owner Contingency	Not Included	Not Included
Total Project Cost incl. Owner Cost	**$356,426,000**	**$568,722,000**

Rev.	Rev. Date
0	04/05/24

BURNS McDONNELL

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5.1.1 General Estimate Basis

A summary of the project cost estimate is included herein. The Project Cost Estimate is based on the site general arrangement (Appendix A) and multiple contract approach. Pricing for major equipment was obtained from equipment supplier budgetary quotes specific to this project. This includes equipment such as the ESP and fabric filter. Major electrical equipment was estimated using recent project costs for similar equipment. Minor equipment was estimated using recent project costs or in-house estimating methods. The majority of the materials have been estimated using current costs obtained from an in-house database or from recent, similar projects.

Union labor rates from RS Means for Montana were used to estimate the labor rate. The basis for the development of direct field hours is an in-house database, applying a working conditions factor unique to the Colstrip facility. The project is estimated assuming a 50-hour, 5 day work week during construction.

5.1.1.1 Indirect Costs

A percentage of the direct costs are included for Engineering, Start Up, and Commercial costs. An overall project contingency, 20% of the direct and indirect costs, is included in the indirect costs. The Escalation is based on the project starting in the fall of 2024 and the second unit coming on line 42 months later. An annual escalation rate of four percent (4%) on engineered equipment, five percent (5%) on materials and four percent (4%) on labor and subcontracts has been included.

5.1.1.2 Items Excluded from Estimated Costs

No Burns & McDonnell Construction Management has been included in the estimated costs. No construction facilities, parking, laydown, turnstiles, etc., have been included in the estimated costs. No Interest During Construction costs or financing fees are included in the estimate. No costs have been included for hazardous material remediation.

5.1.2 Discipline Information

The following are brief outlines of the information and scope of each discipline considered in developing the equipment cost estimate and quantities.

5.1.2.1 Electrical

For the ESP it was assumed the existing auxiliary electric system could not support the new electrical loading of the added ESP electrical loads. The ESP auxiliary electric systems are derived from the 115kV system east of the Unit 4 scrubber building with a new auxiliary transformer tapped from the existing

115kV line. A new relay panel for 115kV line and transformer protection in the existing unit 4 scrubber building was accounted for in the estimate basis. A new 4.16kV ESP switchgear was accounted for in the unit 4 ESP power distribution centers (PDC) to distribute power to 4.16kV/480V station service transformers for the unit 3 and 4 ESP units. Each unit then has local 480V switchgear, motor control centers (MCCs), panelboards, and local uninterruptable power supply (UPS)/direct current (DC) as required to support the ESP unit electrical loads.

For the fabric filter it was assumed the existing 3 and 4 scrubber auxiliary electric system has electrical loading capacity to support the new fabric filter electrical loading. New power feeds were accounted for from the scrubber units power distribution centers (PDC) to distribute power to 4.16kV/480V station service transformers for the unit 3 and 4 fabric filter units. It was assumed the existing scrubber 4.16kV switchgears had spare breakers that would need to be replaced or retrofitted due to relaying and arc flash requirements. For the new air compressors low voltage variable frequency drives (VFDs) would be required provided by the compressor vendor for motor starting. Each fabric filter unit PDC then has local 480V MCCs, panelboards, and local UPS/DC as required to support the fabric filter unit electrical loads.

For both fabric filter and ESP options the following estimate basis was used. That construction power would be available from the existing auxiliary power system. A local ground grid would be created for the ESP and fabric filter that would tie into the plant's existing ground grid. A spare 4.16kV/480V station service transformer was included. Unit 3 and 4 electrical systems were electrically separated at the 480V level and below. It was the plant has existing paging system, telecom, fire protection alarm systems that would be extended to the area. For estimating purposes the ESP or fabric filter vendor supplied all the wiring, raceway, lighting local from the ESP/fabric filter back to the PDCs.

5.1.2.2 Controls

For the ESP option, included in this rough estimate are the management, engineering, equipment, shipping, and field support costs to commission remote input / output (IO) cabinets into the existing distributed control system (DCS). This estimate assumes that existing DCS vendor on record is GE. This estimate includes the engineering and procurement of quantity four remote IO cabinets to be brought back into the existing DCS system. The four remote IO cabinets will contain a total of 845 system hardwired points (20% spares included) and datalink interface to supervisory system. Included in this estimate are spares and startup replacements that the field support may require while commissioning the system. estimate includes time for field support to power check, establish communication to existing system, and startup.

For the fabric filter option, included in this rough estimate are the management, engineering, equipment, shipping, and field support costs to commission remote IO cabinets into the existing DCS. This estimate assumes that existing DCS vendor on record is GE. This estimate includes the engineering and procurement of quantity four remote IO cabinets to be brought back into the existing DCS system. The four remote IO cabinets will contain a total of 825 system hardwired points (20% spares included). Included in this estimate are spares and startup replacements that the field support may require while commissioning the system. The estimate includes time for field support to power check, establish communication to existing system, and startup.

5.1.2.3 Structural

The conceptual design, layout, and material quantities for the ESP structure are developed per the plan and elevation views of the component provided within the vendor (SEI-Group) quote. The proposed structural layout plan and elevation views for the ESP structure are shown in drawings SKS003 and SKS004 respectively. The ESPs are located in the available space towards the South of the units. It is assumed that inlet branch lines are added to the existing flue duct at the elbows upstream of the stack for each unit at the existing elevations. The outlet from the ESP's would branch into the existing flue gas ducts just upstream of the reducers and prior to the main lines entering the stack.

The structural estimate includes the material quantities for the gas flue ductwork, duct support steel, ESP building steel, foundation concrete, and concrete reinforcement. The ESP building steel quantities are developed based on information regarding steel densities for a similar size plant. The ductwork quantities are developed based on the lengths calculated in the conceptual layout and the perimeter for the assumed duct cross section. The calculated surface area is then multiplied by an estimated weight per square footage value which is a proprietary metric developed based on experiential data from multiple past projects to develop the total tonnage of gas flue duct steel. The ductwork is assumed to be supported by support steel frames that are approximately 75' in height. The total length of the ductwork is multiplied by an estimated weight per cubic foot value which is a proprietary metric developed based on experiential data from multiple past projects to develop the total tonnage of support steel below the ductwork.
The foundation is assumed to be constructed using reinforced concrete spread footings on piles. The ESP building foundation is assumed to consist of spread footings on piles. Each spread footing consists of a pedestal and pile cap with five (5) piles per footing. The piles are estimated to be of 18" diameter concrete extending approximately 60' below grade. The foundation for the duct supports is estimated to be a 5'

pile cap supported by fifteen (15) concrete piles per support frame. The concrete piles for duct support steel are also estimated to be of 18" diameter concrete extending approximately 60' below grade.

The conceptual design, layout, and material quantities for the fabric filter are developed per the plan and elevation views of the component provided within the vendor (SEI-Group) quote. The proposed structural layout plan and elevation views for the fabric filter structure are shown in drawings SKS001 and SKS002 respectively. The fabric filter buildings are located in the available space towards the South of the units. It is assumed that inlet branch lines are added to the existing flue duct at the elbows upstream of the stack for each unit at the existing elevations. The outlet from the fabric filter structures would branch into the existing flue gas ducts just upstream of the reducers and prior to the main lines entering the stack.

The structural estimate includes the material quantities for the gas flue ductwork, duct support steel, steel, foundation concrete, and concrete reinforcement. The fabric filter building steel quantities are included in the vendor cost estimate and hence not included here. The ductwork quantities are developed based on the lengths calculated in the conceptual layout and the perimeter for the assumed duct cross section. The calculated surface area is then multiplied by an estimated weight per square footage value which is a proprietary metric developed based on experiential data from multiple past projects to develop the total tonnage of gas flue duct steel. The ductwork is assumed to be supported by support steel frames that are approximately 126' in height. The total length of the ductwork is multiplied by an estimated weight per cubic foot value which is a proprietary metric developed based on experiential data from multiple past projects to develop the total tonnage of support steel below the ductwork.

The foundation is assumed to be constructed using reinforced concrete spread footings on piles. The fabric filter building foundation is assumed to consist of spread footings on piles. Each spread footing consists of a pedestal and pile cap with five (5) piles per footing. The piles are estimated to be of 18" diameter concrete extending approximately 60' below grade. The foundation for the duct supports is estimated to be a 5' pile cap supported by fifteen (15) concrete piles per support frame. The concrete piles for duct support steel are also estimated to be of 18" diameter concrete extending approximately 60' below grade.

5.1.2.4 Mechanical

Both the ESP and fabric filter options include 2x100% air compressors per unit and a single receiver per unit. The size of the air compressors are much larger in the fabric filter option. Air piping has been

included to connect to all air users, and provide air connections around the perimeter of the top of the new equipment and between the rows of hoppers under the new equipment.

The ash handing system is a negative pressure conveying arrangement designed such that the ash from the hoppers will be conveyed in a single conveying line to a new common ash silo. At the ash silo there will be a single filter/separator on top of the silo with an 18" double gate valve. The filter separator will be operated intermittently and will be equipped with a vacuum breaker. Mechanical exhausters (2x100%), with automatic crossover valves, are included.

5.2 OPERATION AND MAINTENANCE, LEVELIZED COSTS

The O&M cost estimates for the various control technology options evaluated for Colstrip included in this study are summarized in Table 5-2.

Table 5-2: O&M Cost and Levelized Cost Summary

Summary of Particulate Emissions Control Costs from Colstrip for Units 3&4

PM-10 Control Alternative (Ranked by PM-10 Rate)	PM Removal Efficiency %	Emissions				Economic Impacts			
		Emission Rate lb/MMBtu	Hourly Emission Lbs/Hr	Annual Emission Tons/yr	Emission Reduction Tons/yr	Installed Capital Cost $1,000	Annual O & M Cost $1,000	Total Annual Cost $1000/yr	Average Control Cost $/ton
Reheat ESP	71.45	0.006	95	355	890	568,722	21,085	88,546	99,536
Reheat fabric filter	71.45	0.006	95	355	890	356,426	14,786	57,065	64,148
2022 Baseline (Scrubber)		0.0220	334	1245		N/A	N/A	N/A	N/A

5.2.1 O&M Cost Basis

O&M costs for the evaluated systems at Colstrip assuming the following parameters:

- Power cost of $45/MWh.
- Operating labor rate of $200,000 for one full time equivalent (FTE).
- Cost of Money 8.25%
- Levelization period, 15 years
- Waste disposal cost, $15/ton
- Unit 3 and 4 capacity factor of 85.0%
- Bag replacement every 5 years for the fabric filter.
- 5% of direct cost for average annual equipment maintenance

* * * * *

6.0 SUMMARY

6.1 SUMMARY

Burns & McDonnell has been retained to assess the cost of two particulate control options located between the reheat system and the stack to meet the proposed MATS Rule. The main objective of this evaluation is to provide an AACE Class 4 cost estimate incorporating site specific factors such as considering the power source for the new control system.

In Section 3, the two control technologies were described. In Part 4, the availability of Colstrip to have guarantees for the technologies was discussed. In Part 5, capital and O&M costs for the two options were estimated.

6.1.1 Balance of Plant Impact Analysis

The compliance plan selected will impact balance of plant equipment at Colstrip. Further detailed studies will be necessary to fully define the detailed scope of the project.

- An ash disposal study should be performed to determine the best method of ash disposal and placement of the ash handling equipment.
- A balance of plant utility interface study should be performed to determine the most cost effective approach on plant utilities such as instrument air, service air, etc.
- A draft system study should be conducted prior to execution of any retrofit technologies. This study would identify any ductwork that would need stiffening or replacement due to the changed pressure drop profile through the system.
- An electrical load study should be conducted to address the addition of the new air pollution control equipment to Colstrip that increases the power consumption at the plant. This study would confirm if the existing station transformers have the capacity to support the balance of plant (BOP) power needs and air compressors. It could also identify potential other, more cost effective, sources of power. For purposes of this study, it was assumed the ESP would be powered by a new transformer connected to the grid. The other systems would be powered from the existing MCC's in the scrubber building.

* * * * *

Attachment B

to

Declaration of Dale E. Lebsack, Jr., President of Talen Montana, LLC and Chief Fossil Officer for Talen Energy Corporation

Declaration of Dale E. Lebsack, Jr. in support of staying the GHG Rule

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

ELECTRIC GENERATORS FOR A SENSIBLE TRANSITION, *Petitioner*, v. U.S. ENVIRONMENTAL PROTECTION AGENCY, *Respondent*.	Case No.: 24-1128

DECLARATION OF DALE E. LEBSACK, JR.

I, Dale E. Lebsack, Jr., declare as follows:

1. I currently work as Chief Fossil Officer for Talen Energy Corporation ("Talen"). I am over the age of 18 years, and I am competent to testify concerning the matters in this declaration. I have personal knowledge of the facts set forth in this declaration, and if called and sworn as a witness, could and would competently testify to them.

2. Petitioners Talen Generation, LLC and Talen Montana Holdings, LLC (the "Talen Entities") are wholly owned subsidiaries of Talen. Talen is an independent power producer that owns and operates approximately 10.7 gigawatts of power infrastructure in the United States. Talen produces and sells electricity, capacity, and ancillary services

into wholesale U.S. power markets, including PJM Interconnection, LLC ("PJM") and the Western Electricity Coordinating Council ("WECC"), with Talen's generation fleet principally located in the Mid-Atlantic and Montana. Talen's generation fleet includes wholly owned and partially owned assets that use nuclear, coal, oil, and natural gas as fuels.

3. In my current position as Chief Fossil Officer at Talen, I am responsible for asset management and operations for Talen's fossil generating assets in PJM, WECC, and ISO New England. In that capacity, I also serve as President of Talen Generation, LLC, which indirectly owns the fossil generating assets in PJM and is an affiliate of Talen. I have worked for Talen and its predecessor companies for over 19 years. Over that time, I have held roles of increasing responsibility in multiple aspects of fossil power generation, including asset management, plant operations, engineering, environmental, health and safety, and project development. I have directly managed merchant generating assets in ERCOT, PJM, ISO-NE, NYISO, WECC, and SERC. The plants that I managed have utilized a wide range of technologies, including coal, gas, oil, and biomass-fired boilers; combined cycle units of varying configurations; and simple cycle gas turbines of differing designs.

4. This declaration is submitted in support of the Petitioner's motion for stay of the U.S. Environmental Protection Agency's final rule entitled *New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units;*

and Repeal of the Affordable Clean Energy Rule, 89 Fed. Reg. 39798 (May 9, 2024) (the "Final Rule" or "Rule"). I am familiar with the Talen Entities' operations, including generation, regulatory compliance, workforce management, and electric markets in general. I also am familiar with the Final Rule, and I am familiar with how the Final Rule will affect the Talen Entities.

5. Talen has ownership interests in coal-fired units that are projected to operate at relatively high capacity factors and will be subject to the Final Rule.

6. Talen is the operator of Units 3 and 4 at the Colstrip Steam Electric Station ("Colstrip") in Rosebud County, Montana. Talen also has a 15 percent ownership stake in these units, which currently consist of two active coal-fired generating units capable of producing up to 1,480 MW of electricity that have been operating for approximately 38 years. Each of the units has approximately 740 MW of generating capacity, and the adjacent Rosebud coal mine supplies Colstrip's low-sulfur subbituminous coal. Units 3 and 4 are the only remaining active units at Colstrip, as Units 1 and 2 recently retired in 2020. Units 3 and 4 have a useful life of at least another two decades.

7. Colstrip is one of the largest coal-fired electric generating facilities west of the Mississippi River, supplying electricity throughout Montana and the Pacific Northwest. Colstrip plays an integral role in maintaining operation of the NorthWestern Balancing Authority in Montana, especially during peak electricity demand events.

THE FINAL RULE

8. The Final Rule establishes, under Section 111(d) of the Clean Air Act, best systems of emission reduction ("BSERs") for existing coal-fired steam generating units

that States must use when setting CO_2 emissions limits for such units. 89 Fed. Reg. at 39,840. Under the provisions of the Rule, Colstrip Units 3 and 4 have three options: (1) retire by January 1, 2032; (2) meet an emission rate based on 40% natural gas co-firing by January 1, 2030, and retire by January 1, 2039; and (3) install and operate 90% efficient carbon capture and storage ("CCS") by January 1, 2032, which would allow the unit to operate after 2038. Based on Talen's assessment, the only compliance strategy available for Colstrip consists of shutting down the plant by January 1, 2032.

9. The CCS BSER established by the Final Rule for existing coal-fired steam units is not yet adequately demonstrated, is not achievable, and is not cost-effective. Further, EPA has established deadlines for incorporating this technology, or in the alternative gas co-firing, that are so unreasonable that they likely cannot be met—even if the technologies were adequately demonstrated and achievable. The end result is that owners and operators will have little choice but to retire such units prematurely.

IMPACT OF THE FINAL RULE ON COLSTRIP

10. The Rule requires major modifications to Colstrip Units 3 and 4 or premature retirement of the Units. Specifically, a decision must be made immediately between the three possible compliance choices (retire by 2032, co-fire gas by 2030, or install full CCS by 2032) in order to complete any retrofits in time for the Rule's compliance deadlines. Prematurely shutting down Colstrip would have significant economic impacts on Montana and beyond and raises serious concerns about grid reliability and transmission.

11. Feasibility and cost evaluations of each compliance option, not to mention financing, engineering, design and construction of the gas-cofiring and CCS options, require years of planning. Additionally, Colstrip is co-owned by six companies, including many utilities subject to PUC regulation in multiple states. The selection of a future compliance option must be agreed upon by a majority of ownership. After the evaluation of compliance options is complete, approval of an option will be difficult and take more time due to the plant's ownership structure.

12. If the CCS and gas co-firing compliance options are impossible or near impossible to meet the Rule's deadlines, or prove prohibitively expensive to undertake, especially in light of future uncertainty, the Rule requires retiring Colstrip Units 3 and 4 by January 1, 2032.

Feasibility and Cost Issues are Compounded by EPA's New MATS Rule

13. Furthermore, the compliance decision for the Rule is intertwined with the EPA's also recently-issued final rule entitled *National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review*, 89 Fed. Reg. 38,503 (May 7, 2024) ("MATS Rule").

14. For Colstrip to operate beyond 2027, under the MATS rule, additional costly filterable particulate matter ("fPM") controls must be installed, commissioned, and operable on Units 3 and 4 by July 8, 2027.

15. Colstrip would need to undertake a massive and complex construction project to install, test, and implement these new controls the costs of which are estimated to exceed $350 million.

16. If the only feasible compliance option for the Final Rule is found to be retirement, then the investment in fPM controls for just over four years (late 2027 to the end of 2032) would be even less justifiable than otherwise. Indeed, a return period of four years on a greater than $350 million investment in fPM controls would be extremely difficult to justify, thus likely requiring Colstrip to shut down by the MATS Rule's compliance deadline of July 2027.

CCS is Not Achievable at Colstrip

17. CCS is impracticable and infeasible at Colstrip. The Final Rule allows affected EGUs to remain in operation beyond 2038 only if they can achieve 90% capture of carbon using CCS by 2032. However, this is not possible at Colstrip for the following reasons.

18. The technology to reliably achieve 90% capture of CO_2 using CCS is not adequately demonstrated or readily available. As described above, CCS is an emerging technology that remains unreliable, as well as prohibitively expensive. And there is not enough time to undertake all of the evaluations and studies, design, engineering, and construction of a CCS system at Colstrip. Talen would not invest hundreds of millions of dollars in a technology that is at best uncertain to work and that, in fact, Talen believes will not work as EPA claims it would by the Rule's deadline.

19. Technological issues related to carbon capture are not the only reason Colstrip would be unable to rely on the CCS pathway to comply with the Final Rule. Even if 90% of CO_2 could be captured by 2032, it would need to be transported for storage and stored. Sequestration sites have not been adequately demonstrated in the vicinity of Colstrip and would require additional time, exploration, and significant cost to complete, in addition to the costs associated with transportation of the CO_2. Colstrip, located in eastern Montana, is not near to any developed CO_2 sequestration sites. It is not known whether the geological formations necessary for CO_2 sequestration exist in the vicinity of Colstrip, and additional drilling and exploration would be required to determine this. Further, no pipeline currently exists to carry captured CO_2 from Colstrip to a storage location.

20. In fact, a study referenced in the proposed Rule reports that the costs of transportation and storage for the purposes of CCS are much higher in Montana's Powder River Basin than in other states. CO_2 pipeline transportation and storage cost in 2018 was $22/tonne for the Powder River Basin. The other basins in the study were Illinois ($10/tonne), East Texas ($11/tonne) and Williston ($15/tonne).

21. On top of these prohibitive costs, there are a number of other challenges associated with evaluating, permitting, siting, designing, and constructing such a CO_2 pipeline. Permits and easements would need to be acquired. It is unlikely such a pipeline could be constructed and operational prior to the compliance date required by the Final Rule.

22. The provision allowing for a one-year extension in the compliance deadline where the delay is needed to complete installation of controls and where the company has taken all steps necessary to otherwise meet the deadline does not make a difference. It is equally unrealistic to expect CCS to be constructed and operational at Colstrip by January 1, 2032, as it is unrealistic to expect it by January 1, 2033.

23. For the reasons outlined above, CCS is not an option for Colstrip.

Gas Co-Firing is Not Achievable at Colstrip

24. As an alternative to CCS, the Final Rule allows affected coal-fired EGUs to remain in operation until January 1, 2039, if they begin co-firing with 40% gas by 2030.

25. A project to retrofit Colstrip to co-fire gas would be exceedingly complicated and expensive. According to preliminary evaluations, conversion of Units 3 and 4 to allow for co-firing of gas would cost in excess of $150 million.

26. In addition to the retrofitting, co-firing gas at Colstrip would require new infrastructure that does not exist. The closest gas transmission pipeline is over 100 miles away. Building such a pipeline would cost on the order of $200 million or more and is economically infeasible. In addition, there are a multitude of challenges and high-cost items, especially involving the need for easement acquisition and permitting for a pipeline estimated to be over 100 miles long.

27. Putting aside that gas co-firing at Colstrip is so costly that it is economically infeasible (*i.e.*, such a costly project would make the Colstrip plant financially unviable), it is also technically near impossible to execute by 2030. A 100-mile gas pipeline is a massive construction project that requires a long lead time for design,

permitting, siting, procurement, and construction. It is also the type of project that will engender protracted challenges. It is highly improbable such a project can be accomplished by the Final Rule's deadline.

28. The provision allowing for a one-year extension in the compliance deadline where the delay is needed to compete installation of controls and where the company has taken all steps necessary to otherwise meet the deadline does not make a difference. It is equally unrealistic to expect a 100-mile gas pipeline to be constructed for Colstrip by January 1, 2030, as it is unrealistic to expect it by January 1, 2031.

29. For the reasons outlined above, gas-co-firing is not an option for Colstrip.

Without a Stay, Talen will Suffer Immediate, Irreparable Harm

30. During the pendency of this litigation, the Talen Entities would sustain the following concrete, irreparable harms if a stay of the Final Rule is not granted:

a. The costs to immediately begin designing, constructing, and permitting a gas pipeline for the ability to co-fire gas at Colstrip and to retrofit the units to provide for co-firing with gas; or

b. The costs to retrofit Colstrip with CCS, to begin construction of a pipeline to transport CO_2 for sequestration, and to evaluate and develop an acceptable site for sequestration.

31. Talen personnel would immediately begin to dedicate substantial time, attention, and resources to tasks associated with evaluating, designing, and financing such projects, which would divert attention from other important duties.

32. Dollars spent on design, permitting, engineering, and other studies cannot be refunded once they are spent. The costs associated with implementing 40 percent natural gas co-firing or installing CCS to achieve 90 percent capture of CO_2 so that Colstrip can operate beyond 2032 are massive. Colstrip would need to spend significant time, resources, and investments to not only implement the technologies, but also to construct supporting infrastructure. When added to the costs associated with complying with the proposed requirements in other rulemakings that impact Colstrip, such as the 2024 MATS Rule, the investments required for Colstrip to operate beyond 2032 would cost many hundreds of millions of dollars. Such costs would likely render Colstrip financially unviable, given Colstrip's uncertain but limited future.

Premature Retirement is the Only Option for Colstrip

33. Given that the CCS and co-firing compliance options are nearly impossible to execute successfully by the Rule's deadlines, and given that the costs of these compliance options would be prohibitively expensive to undertake, especially in light of future uncertainty, the Rule requires retiring Colstrip Units 3 and 4 by January 1, 2032. As discussed above, moreover, the interplay between the Rule and the MATS Rule means that Colstrip would likely retire by July 2027.

34. This litigation is likely to take a minimum of 2 to 3 years. If the Rule is not stayed, Talen will have suffered irreparable harm by the time the legality of the rule is determined. Before we know whether the rule will be struck down, Talen would have to elect – within a year at the most – to shut down Colstrip, and it would have to actually shut down the plant by mid-2027.

35. A decision to retire Colstrip, especially if forced to be made quickly, will have irreversible impacts to the small community around the plant and the neighboring Rosebud Mine. The mine and the power plant are the only employers of any size within 50 miles and contribute immensely to the local economy and tax revenues.

36. In addition, the Talen Entities would face increased costs related to environmental remediation that is ongoing at Colstrip, pursuant to an Administrative Order on Consent between Talen and the Montana Department of Environmental Quality. The current groundwater remediation system reuses captured water at Units 3 and 4. If the Units are prematurely shut down, additional wastewater treatment systems would be needed, which would increase overall remediation costs by approximately $2.5 million per year during the period of the premature shutdown.

The Public will Suffer Irreparable Harm if Colstrip is Retired Prematurely

37. Further, Colstrip is vital to ensuring that Montanans have affordable and reliable electricity, especially during peak winter and summer months. Colstrip is one of Montana's most important energy assets, especially as demand for reliable baseload power in the western U.S. continues to grow.

38. The likely end result of the Final Rule on Colstrip is that its owners and operators, including the Talen Entities, will have little choice but to retire the units prematurely. Such decisions will change the makeup of the nation's electricity system and increase risks to electric and transmission system reliability.

39. Risks to electricity system reliability, driven in part by the early retirement of dispatchable, high-capacity factor thermal EGUs such as Colstrip, is a matter of

significant concern. WECC reports that current utility resource plans in the western interconnect "are not sufficient to meet future demand over each of the next 10 years," and that "starting in 2026, the number and magnitude of demand-at-risk hours increase by orders of magnitude."[1]

a. In statements made in comments on both the proposed MATS rule and the proposed version of this Rule in 2023, Northwestern Energy indicated that there will not be sufficient replacement power on the grid by 2027 if Colstrip must retire.

40. Colstrip Units 3 and 4 generated approximately 41 percent of the electricity generated in Montana in 2022 and represented 23 percent of total installed generating capacity. A decision to prematurely retire Colstrip, an important baseload generator serving at least five states, would cause significant reliability concerns. These concerns would apply well into the rest of the decade, even if the Rule is not stayed and is struck down by the courts at around the same time the plant would shut down.

Dale E. Lebsack, Jr.

Dated: May 24, 2024

[1] Western Electricity Coordinating Council, 2023 Western Assessment of Resource Adequacy (Nov. 2023), *available at* https://www.wecc.org/Administrative/2023%20Western%20Assessment%20of%20Resource%20Adequacy.pdf (Attachment A).

Attachment C

to

Declaration of Dale E. Lebsack, Jr., President of Talen Montana, LLC and Chief Fossil Officer for Talen Energy Corporation

Economic Study by Dr. Patrick M. Barkey, Ph.D.

The Economic Implications of MATS Rulemaking in Montana
Final Report

On April 25, 2024, the U.S. Environmental Protection Agency released a final rule significantly revising the Mercury Air and Toxics Standards (MATS) for coal-fired electric power plants. That rule would require substantial investment at the Colstrip Steam Electric Station (SES), Montana's largest electric generating facility located in Rosebud County in southeast Montana, to continue operation. Such an investment may not be technically or financially feasible for the facility. This would render the continued operation of the Colstrip SES beyond the date of July 8, 2027, when the applicable provisions of the new MATS go into effect, in doubt.

Should the MATS rulemaking result in the premature closure of the Colstrip SES, it would be a significant economic event. This was demonstrated by a 2018 study published by the University of Montana Bureau of Business and Economic Research (Bureau of Business and Economic Research, 2018), which found that an early closure of the coal-fired generator would have sizable impacts on jobs, incomes, tax revenue and population.

A key factor that contributed to the size and scope of the impacts identified in that study is the close relationship of the generating station to the adjacent Rosebud coal mine, owned and operated by Westmoreland. The Colstrip SES is a mine mouth plant, receiving its coal via a dedicated conveyor from the mine. With no rail access to ship its coal to the broader market, any circumstance that terminates electricity generation at the Colstrip SES would bring about the closure of the mine.

The purpose of this report is to bring those estimates of economic impacts up to date, using the most current operating information and conforming to the specific timetable of the MATS rulemaking. The research question addressed is: what would be the consequences for the Montana economy, in terms of jobs, income, spending, output and population, if the new MATS rulemaking brought about the closure of the Colstrip SES in mid-2027?

The basic approach of this research is to compare two futures for the state economy. The baseline projection is a status quo scenario where the generating station and the adjacent mine continue to operate as today. The alternative scenario is premature retirement of the two facilities, with production ceasing in mid-2027. In the alternative scenario, the economic flows ultimately supported by the production of electricity from the Colstrip SES, are removed from the economy, with important implications for those who receive those flow and spend again in the economy.

The difference between these two projections of the future of the Montana economy is the economic impact of the Colstrip SES closure. We produce these projections with an economic model that has been constructed and calibrated for this purpose, leased from Regional Economic Models, Inc. (REMI). The REMI model, described in more detail in Appendix B of this report, has been extensively documented and utilized in both peer-reviewed and other research studies. The model combines a detailed, 70-sector economic output model, a multi-equation econometric model and a demographic model to serve as a powerful tool to assess policies and events affecting the economy (Cassing & Giaratini, 1992).

About This Study

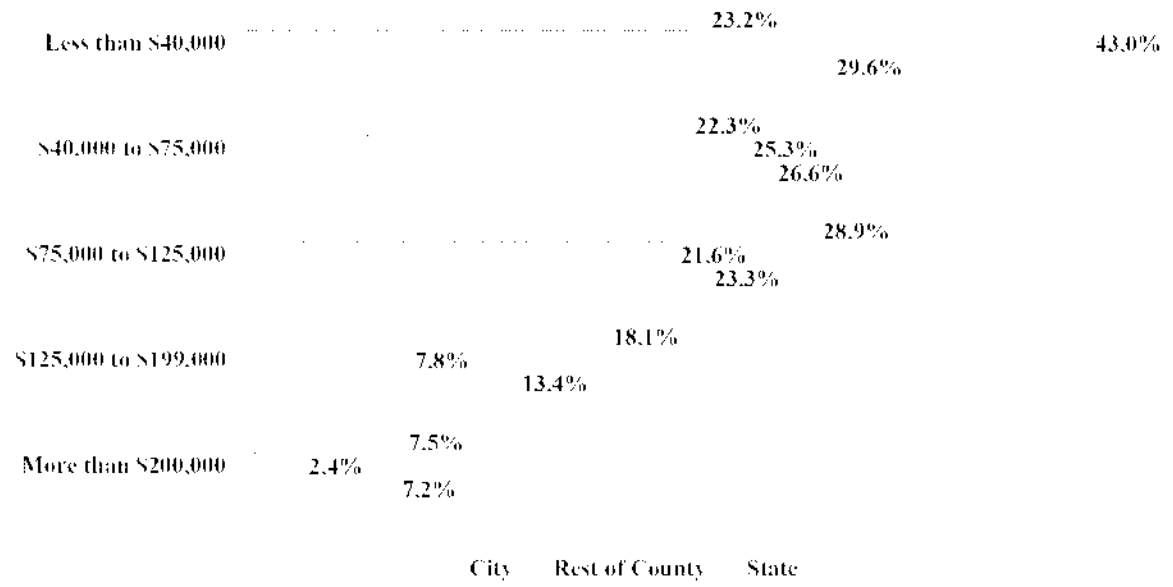
This study was produced by Patrick M. Barkey, Ph.D., who has been retained by Baker Botts and Baker & Hostetler LLP. The research was conducted in June of 2024. The study has benefited from operational and financial information on actual operations of both the Colstrip SES and the Rosebud Mine provided by the facilities themselves. All findings of this study, as well as any errors or omissions, are solely the responsibility of Dr. Barkey, who produced all the research findings in this report.

The Colstrip SES and the Rosebud Mine

The city of Colstrip in Rosebud County in southeast Montana is home to two of the largest and highest paying industrial facilities in the entire state the Colstrip SES and the Rosebud Mine. The economic prosperity that is enjoyed in the community today because of the presence of these major employers is evident from the earnings data from the American Community Survey conducted by the Census Bureau shown in Figure 1.

Figure 1

2022 Household Income



Compared to the state and especially to the remainder of Rosebud County, household income in the city of Colstrip is tilted to the upper side of the income distribution. Almost 29 percent of Colstrip households earn between $75,000 and $125,000 in annual income. All the earnings categories shown in the Figure above those amounts contain higher percentages of Colstrip households than elsewhere as well, which stands in stark contrast to most other communities in the eastern third of Montana.

Summary of Findings

The basic finding of this research is that the premature closure of the Colstrip SES (which also necessitates the closure of the adjacent Rosebud Mine) would be a significant setback for the economy of the state of Montana. Based on a comparison of economic activity that is projected under a status quo, no-closure scenario, the research shows that an economy where the closures take place is smaller by:

- 3,262 permanent, year-round jobs in the year 2028, the first full year of closure for the mine and the generating station. The lost jobs occur across a wide spectrum of industries and occupations.

- $240.3 million dollars in income received by households during the year 2028, due to the loss of jobs and people in the smaller state economy that results from the closure of the facilities. The loss of $203.4 million in disposable, after tax, income received by households in 2028 represents a considerable decline in spending power in local economies throughout the state.

- Over a billion dollars in economic output, generally defined as gross receipts of business and non-business organizations. The loss of revenue from sales is felt by every industry in the economy, from health care to retail sales.

- $102.8 million in selected tax and non-tax revenues to Montana state government in 2028, due not only to the reduction in the size of the overall economy, but also to the loss of specific tax revenue from coal and utility operations in the wake of closures at the Colstrip SES and the Rosebud Mine.

- 1,305 people in 2028, growing to more than 4,100 people in year 2040, who leave the state due to the loss of economic opportunity due to MATS rulemaking-induced closures in Colstrip.

Table 1

The Economic Implications of MATS Rulemaking in Montana
Impacts Summary

		Impacts by Year		
Category	Units	2028	2035	2040
Total Employment	Jobs	-3,262	-3,020	-2,890
Personal Income	$ Millions*	-240.3	-284.8	-310.0
Disposable Personal Income	$ Millions*	-203.4	-244.9	-268.5
Selected State Revenues	$ Millions*	-102.8	-120.4	-126.8
Output	$ Millions*	-1,011.4	-1,006.3	-1,016.8
Population	People	-1,305	-3,647	-4,106

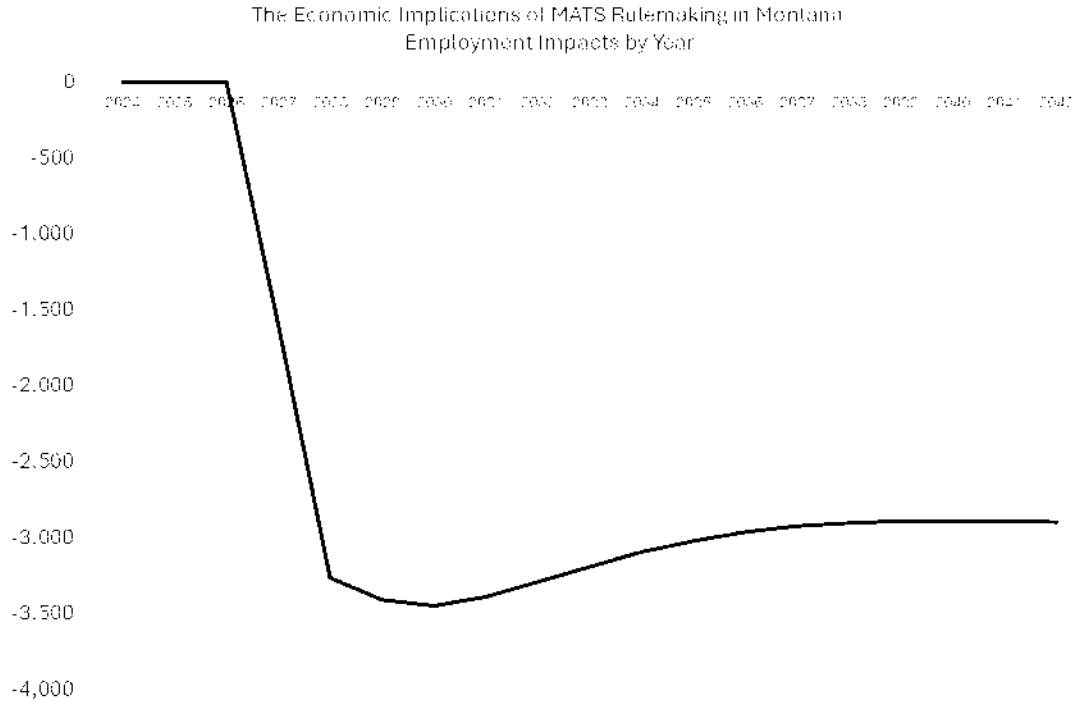
*All dollar amounts are inflation-corrected, expressed in terms of 2024 dollars

Each of these specific impacts represent the difference in economic activity between a status quo, no closure economy and the economy that is expected to emerge after the closure of the Colstrip SES and the Rosebud Mine.

As shown in Table 1, the impacts of MATS rulemaking are expected to evolve over time over the next 15 years. These changes over time are the product of several different forces. Productivity gains over time slightly reduce the expected employment losses but result in income losses that are larger. The out-migration of Montanans who leave for other states (or those who would move here except for the closures) rises over time, with deleterious effects on everything from income to tax revenues.

The evolution of these impacts is shown graphically in Figure 2 for employment impacts. With the closures assumed to take place at the midpoint of year 2027, the first year with ceased operations at the mine and the generation station is 2028. Employment impacts grow in absolute value beyond that year as industries like construction suffer from the oversupply of structures. The low point is the year 2030, when employment impacts are 3,486 jobs.

Figure 2



As is the case for most situations where jobs are created or lost in a regional economy, the number of jobs ultimately lost in the overall economy shown in Figure 2 exceeds the number of jobs eliminated at the mine and the generating station due to their closure. These knock-on effects in the overall economy occur as the lost revenue of those who previously received the employee and vendor spending of the facilities propagates through their own spending and employment. Nonetheless, the additional job losses that are expected to occur in the wake of MATS rulemaking-induced closures in Colstrip are large.

Three factors account for the magnitude of job losses that occur.

The first is the nature of the jobs at the mine and the generating station. These are capital-intensive, high value-added businesses that compensate their employees very well – average compensation at each facility is more than twice as high as the Montana average earnings per job.

Secondly, the production of coal and electricity involves a high fraction of inputs that are made in Montana. Thus, vendor spending of the facilities is more likely to be directed within the state, instead of being lost to the economy when purchases of goods and services are directed to suppliers located elsewhere.

Finally, there is the special tax treatment of production in natural resources in Montana, especially coal mining. Table 1 shows state revenue losses exceeding $100 million as a result of closures of the mine and generating station. These revenue losses result in a loss of government spending or possibly higher tax rates on the rest of the economy, which contribute to lower employment as well.

The impacts on the state economy that are caused by the MATS rulemaking-induced closure of the Colstrip SES and the adjacent Rosebud Mine that are summarized in Table 1 are sizable, yet they are likely to understate the losses that actually occur. This is because this analysis does not take into account

other factors and events that would occur in the wake of the loss of the state's largest producer of electricity. These include:

- The implications of the loss of property tax revenues to local governments
- The electricity rate implications of the stranded capital costs borne by the Montana investor-owned utility that is partial owner of the Colstrip SES
- The implications for pricing and reliability of electricity supply as Colstrip generation is lost
- The cost of building replacement generation

None of these factors are considered in the closure analysis presented here.

Detailed Findings

Further insights on how the overall decline in the state economy caused by the MATS rulemaking-induced closures of the Colstrip SES and the Rosebud Mine can be gleaned from an examination of the impacts in greater detail.

Tables 2-7 on the following pages report on impacts for employment by industry, personal income, compensation and earnings, economic output, selected state tax and non-tax revenues, and population, respectively.

The employment impacts in Table 2 clearly show how the losses in utility and mining employment associated directly with the closures in Colstrip propagate to the broader economy.

Table 2

The Economic Implications of MATS Rulemaking in Montana
Employment Impacts (Jobs)

	Impacts by Year		
Industry	2028	2035	2040
Construction	-592	-362	-254
Manufacturing	-44	-27	-23
Mining	-328	-323	-319
Utilities	-270	-266	-265
Retail Trade	-260	-242	-230
Transportation and Warehousing	-66	-52	-49
Professional and Technical Services	-171	-164	-160
Administrative and Waste Services	-163	-147	-141
Health Care and Social Assistance	-196	-174	-184
Arts, Entertainment, and Recreation	-49	-36	-37
Accommodation and Food Services	-169	-199	-212
Other Services, except Public Administration	-130	-115	-116
Other	-823	-913	-898
Total	-3,262	-3,020	-2,890

Personal income is the income received by households. The detail on the components of the impacts on personal income shown in Table 3 reveals that while most of the losses stem from declines in earnings related to job losses, there are also sizable impacts on non-labor source of income that results from the smaller post-closure economy.

Table 3

The Economic Implications of MATS Rulemaking in Montana
Personal Income Impacts (Millions of Dollars*)

Category		Impacts by Year 2028	2035	2040
Total Earnings by Place of Work		**275.4**	**274.8**	**273.2**
	Total Wage and Salary Disbursements	188.4	192.1	192.2
	Supplements to Wages and Salaries	49.6	58.3	60.5
	Employer contributions for employee pension and insurance funds	31.6	37.2	38.6
	Employer contributions for government social insurance	17.9	21.1	21.9
	Proprietors' income with inventory valuation and capital consumption adjustments	37.4	24.4	20.5
Less:				
	Contributions for government social insurance	37.1	39.9	40.2
	Employee and self employed contributions for government social insurance	19.1	18.8	18.4
	Employer contributions for government social insurance	17.9	21.1	21.9
Plus:				
	Adjustment for residence	0.7	0.7	0.6
	Gross In	0.1	0.3	0.3
	Gross Out	-0.6	-0.4	-0.4
Equals	**Net earnings by place of residence**	**-237.6**	**-234.2**	**-232.3**
Plus				
	Property Income	-7.9	-31.4	-42.6
	Dividends	-3.4	-13.7	-18.7
	Interest	-2.9	-11.5	-15.3
	Rent	-1.5	-6.3	-8.6
	Personal Current Transfer Receipts	-8.1	-19.1	-35.2
Equals:	**Personal Income**	**-240.3**	**-284.8**	**-310.0**
Less:				
	Personal Current Taxes	36.8	40.0	41.5
Equals:	**Disposable Personal Income**	**203.4**	**244.9**	**268.5**

*All dollar amounts are inflation corrected, expressed in terms of 2024 dollars.

The additional detail on wages, compensation and earnings impacts shown in Table 4 show how income losses are borne by both wage and salary workers as well as business proprietors. The average earnings for the total of all jobs lost, as shown in the table, far exceeds the average earnings of jobs overall in Montana.

Table 4

The Economic Implications of MATS Rulemaking in Montana
Earnings and Compensation Impacts (Millions of Dollars*)

Category	Units	Impacts by Year 2028	2035	2040
Wages and Salaries	$ Millions	-$188.4	-$192.1	-$192.2
Compensation	$ Millions	-$238.0	-$250.4	-$252.7
Earnings	$ Millions	-$275.4	-$274.8	-$273.2
Earnings per Job, Lost Jobs	$ Dollars	$84,425	$91,017	$94,520

*All dollar amounts are inflation-corrected, expressed in terms of 2024 dollars.

Economic output is defined as gross receipts of business and non-business organizations, with the exception of retail and wholesale trade, where markup is used. The output impacts in Table 5 show how the revenues of Montana industries are significantly affected by closures occurring in Colstrip. Including the lost revenues of the mine and generating station, these exceed $1 billion.

Table 5

The Economic Implications of MATS Rulemaking in Montana
Output Impacts (Millions of Dollars*)

Industry	Impacts by Year 2028	2035	2040
Construction	-95.7	-64.6	-48.1
Manufacturing	-30.5	-18.0	-15.7
Utilities	-310.9	-324.7	-335.9
Mining	-258.5	-254.4	-252.4
Retail Trade	-31.2	-35.8	-39.3
Transportation and Warehousing	-16.9	-14.1	-14.4
Professional and Technical Services	-28.9	-32.4	-34.6
Administrative and Waste Services	-18.6	-19.7	-20.7
Health Care and Social Assistance	-29.5	-31.0	-35.8
Arts, Entertainment, and Recreation	-4.4	-3.6	-3.8
Accommodation and Food Services	-16.5	-20.6	-23.2
Other Services, except Public Administration	-9.8	-9.8	-10.4
Other Private	-94.4	-88.4	-92.1
Government	-65.5	-89.2	-90.4
TOTAL	-$1,011.4	-$1,006.3	-$1,016.8

*All dollar amounts are inflation-corrected, expressed in terms of 2024 dollars.

The smaller economy that results from the MATS rulemaking-induced closures in Colstrip yields a lower revenue base for the state. Revenues are also affected by the loss of production taxes at the Rosebud Mine and the Colstrip SES, which are categorized as selected sales taxes shown in Table 6. Not all revenue sources shown in the table are general fund revenues subject to the discretion of the legislature. Taken as a whole, they exceed $100 million per year.

Table 6

The Economic Implications of MATS Rulemaking in Montana
Selected State Revenue Impacts (Millions of Dollars*)

	Impacts by Year		
Category	2028	2035	2040
Intergovernmental Revenue	-5.3	-14.9	-16.8
Selective Sales Tax	-46.9	-47.3	-47.5
License Taxes	-1.1	-1.3	-1.4
Individual Income Tax	-10.7	-11.6	-12.0
Corporate Income Tax	-3.4	-3.4	-3.4
Other Taxes	-2.6	-3.0	-3.3
Current Charges	-3.5	-4.1	-4.5
Miscellaneous General Revenue	-2.8	-3.3	-3.6
Utility Revenue	-0.3	-0.3	-0.4
Liquor Store Revenue	-0.7	-0.8	-0.8
Insurance Trust Revenue	-25.6	-30.3	-33.0
Total	**-$102.8**	**-$120.4**	**-$126.8**

*All dollar amounts are inflation-corrected, expressed in terms of 2024 dollars.

An important factor in all of these detailed impacts is the change in population that is expected to occur due to the closures in Colstrip. This is not a prediction of overall population decline, but a population level that is lower than what would have occurred if the closures did not take place. As shown in Table 7, the population impacts increase substantially over time, and are dominated by those of working age and their children.

Table 7

The Economic Implications of MATS Rulemaking in Montana
Population Impacts (People)

	Impacts by Year		
Age Cohort	2028	2035	2040
Ages 0-14	-318	-923	-1,014
Ages 15-24	-279	-452	-507
Ages 25-64	707	2,192	2,421
Ages 65+	2	81	164
Total	1,305	3,647	4,106

Conclusion

This report has summarized and documented the findings of an analysis of the economic implications of the MATS rulemaking in Montana. Specifically, it addresses how the MATS rulemaking-induced closure of the Colstrip Steam Electric Station (SES) in Rosebud County in southeast Montana due to the physical or economic infeasibility of meeting the reduced mercury emission threshold in the new final MATS rule would affect the economy of the state. The potential for economic harm from the rulemaking is made greater due to the tight coupling between the Colstrip SES and the immediately adjacent Rosebud Mine that serves the generation station with its coal supply via conveyor belt. This is because without substantial new development in rail infrastructure, the continued production of coal with the closure of the generating station would be impossible and its closure would occur as well.

The basic finding of this study is that implementation of the new MATS standard would be a significant negative event for the Montana economy. The loss of the high-paying jobs at the two facilities, and the cessation of the significant vendor spending and tax revenues associated with their operation, would ultimately precipitate a loss of 3,262 jobs in 2028, the first full year of closure after the new standards take effect. This impact represents the difference between what employment in the state would have been in a no-closure scenario and the post-closure job total. This employment impact grows to 3,446 jobs in 2030.

Other dimensions of economic vitality are presented in this report. All underscore the overall conclusion that a Montana economy that is required to meet the final rule of the U.S. Environmental Protection Agency's MATS regulation is smaller, less prosperous, and less populous than would occur if the current rules remained in effect.

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Appendix A

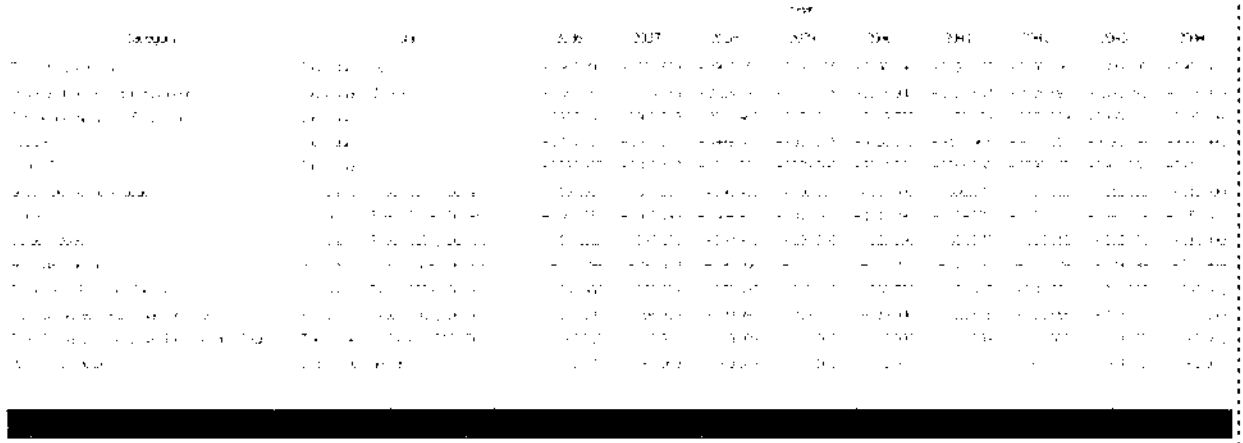
REMI Model Output

MATS rulemaking impacts - Economic Summary

		Year								
Category	Units	2027	2028	2029	2030	2031	2032	2033	2034	2035
[redacted]										

Comparison Type: Montana - Forecast: Differences - Comparison Forecast: MATS rulemaking impacts

MATS rulemaking impacts - Economic Summary

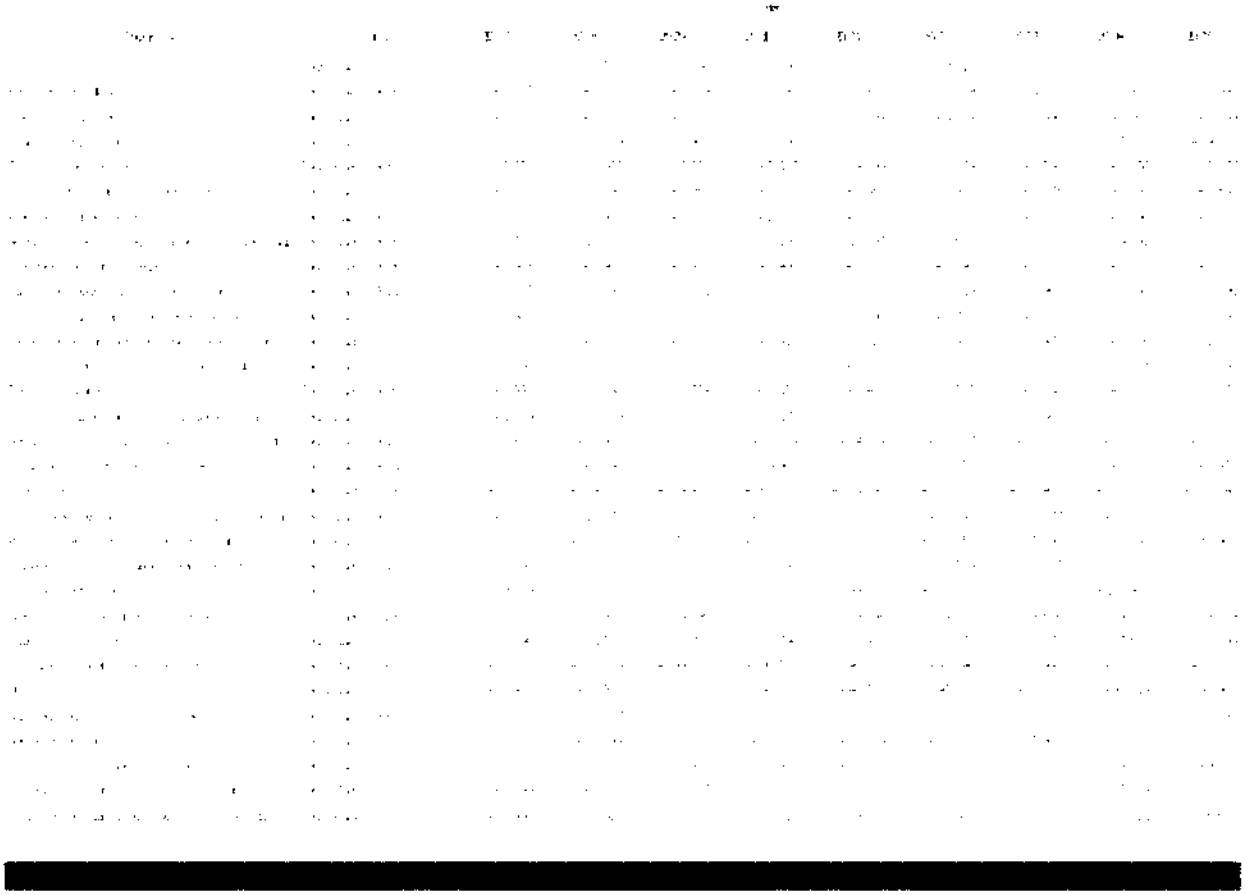


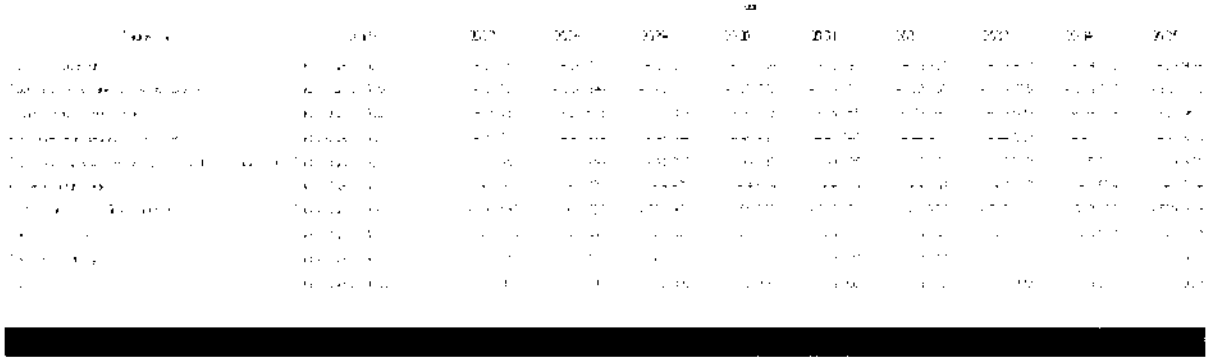
Comparison Type: Montana - Forecast: Differences - Comparison Forecast: MATS rulemaking impacts

MATS rulemaking impacts - Industry Profile

All industries	Total industry labor	+1594.041	+3261.849	+3410.891	+3446.125	+3389.968	+3293.942	+3190.278	+3095.574	+3019.622

[redacted]





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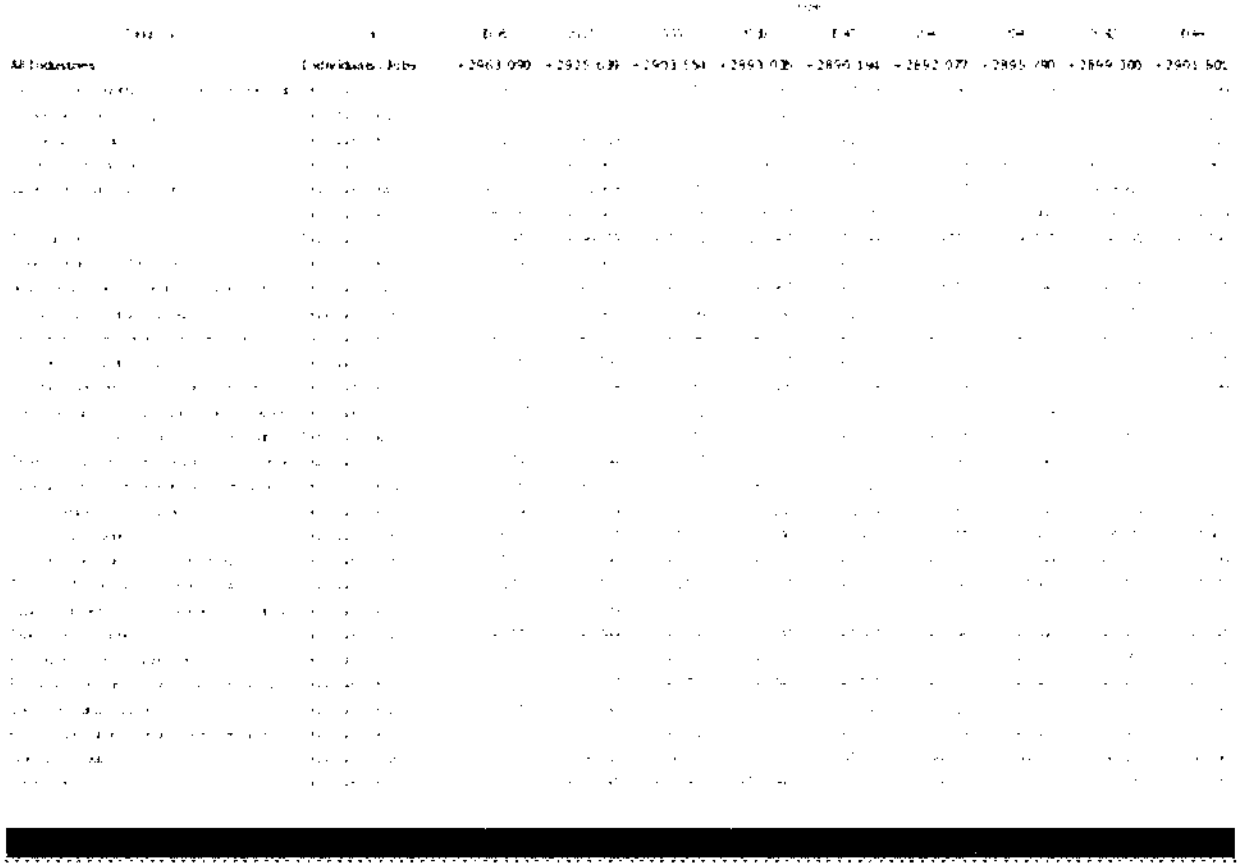
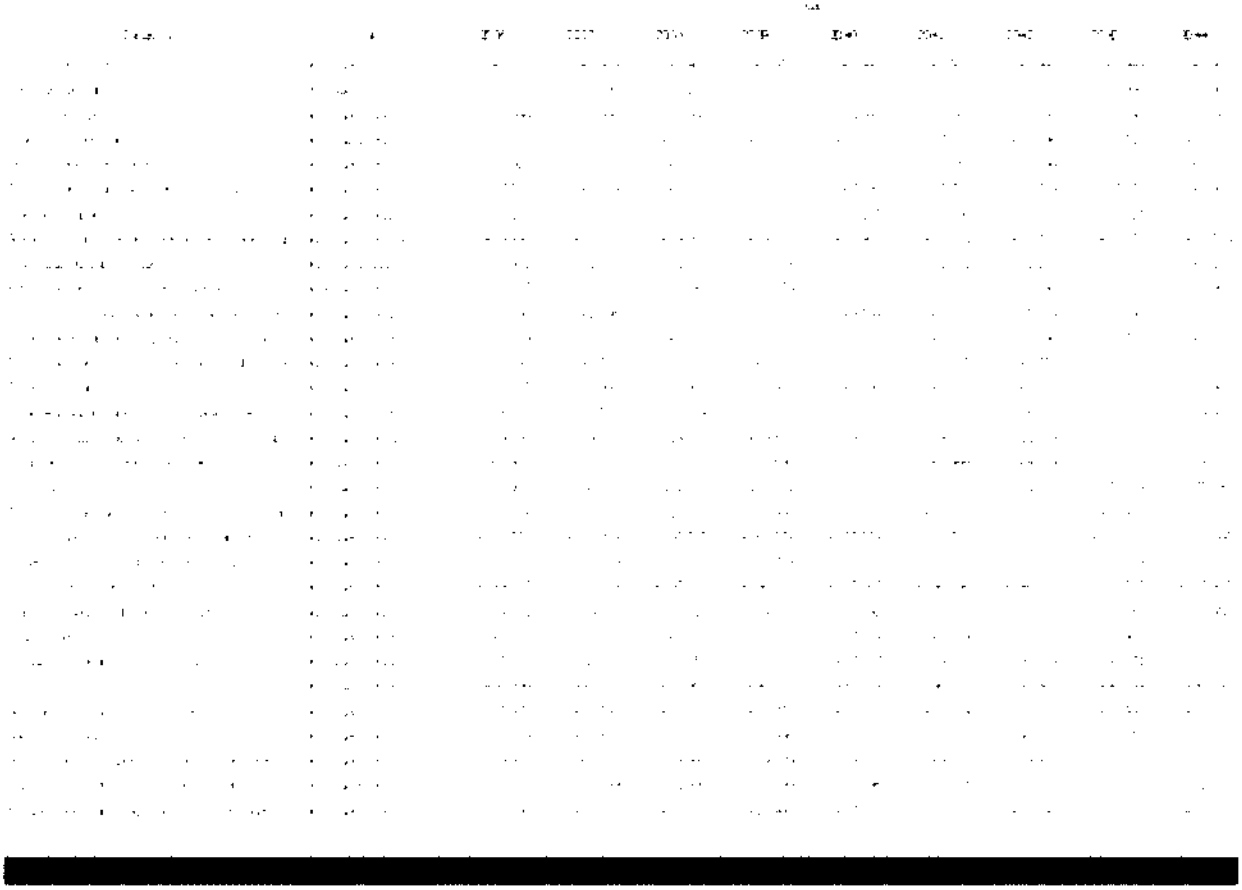
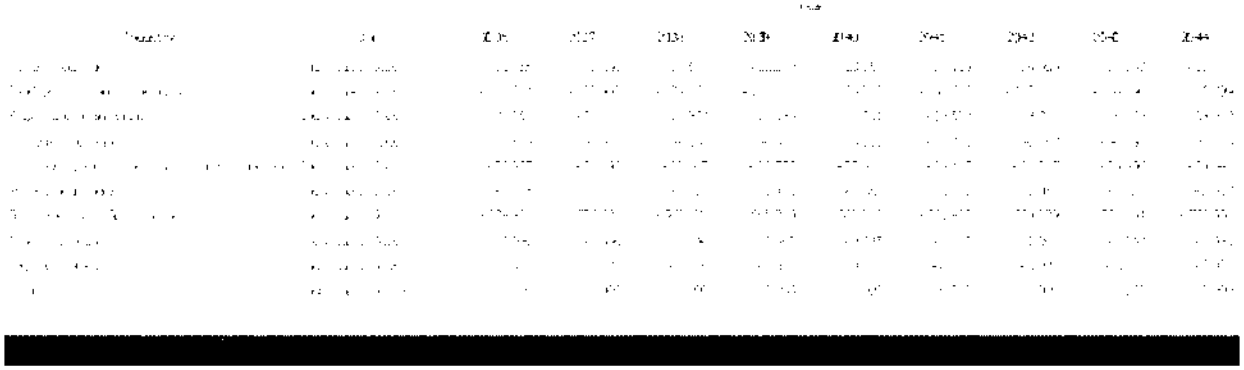
MATS rulemaking impacts - Industry Profile







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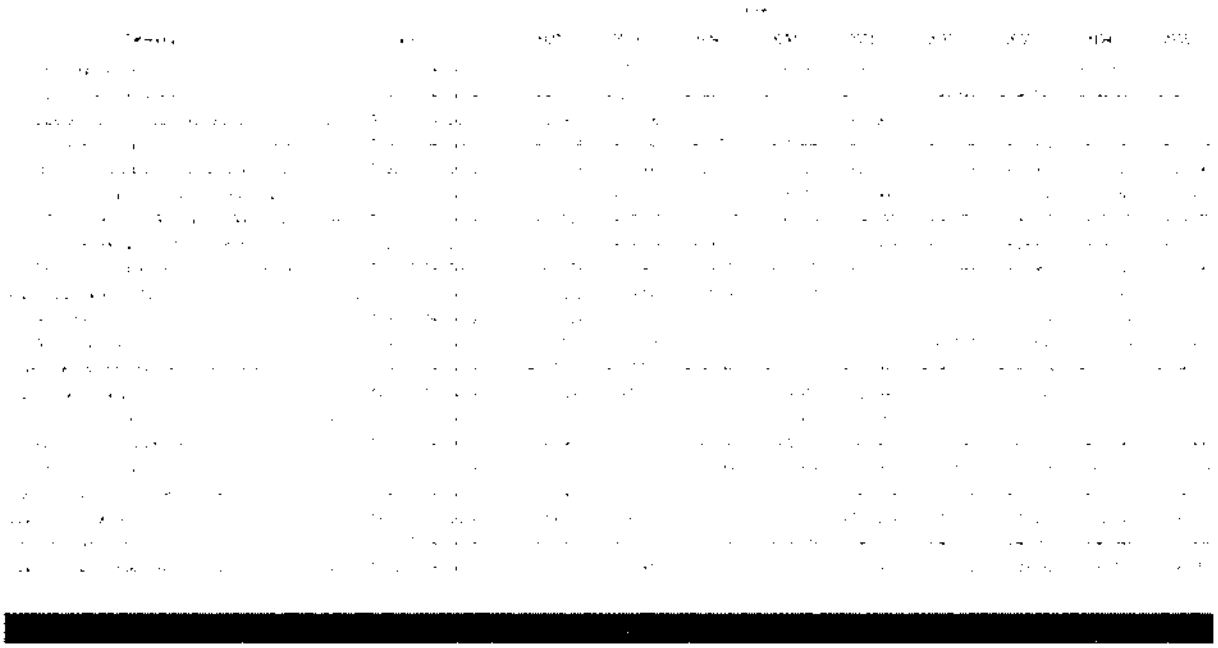
MATS rulemaking impacts - Income Profile



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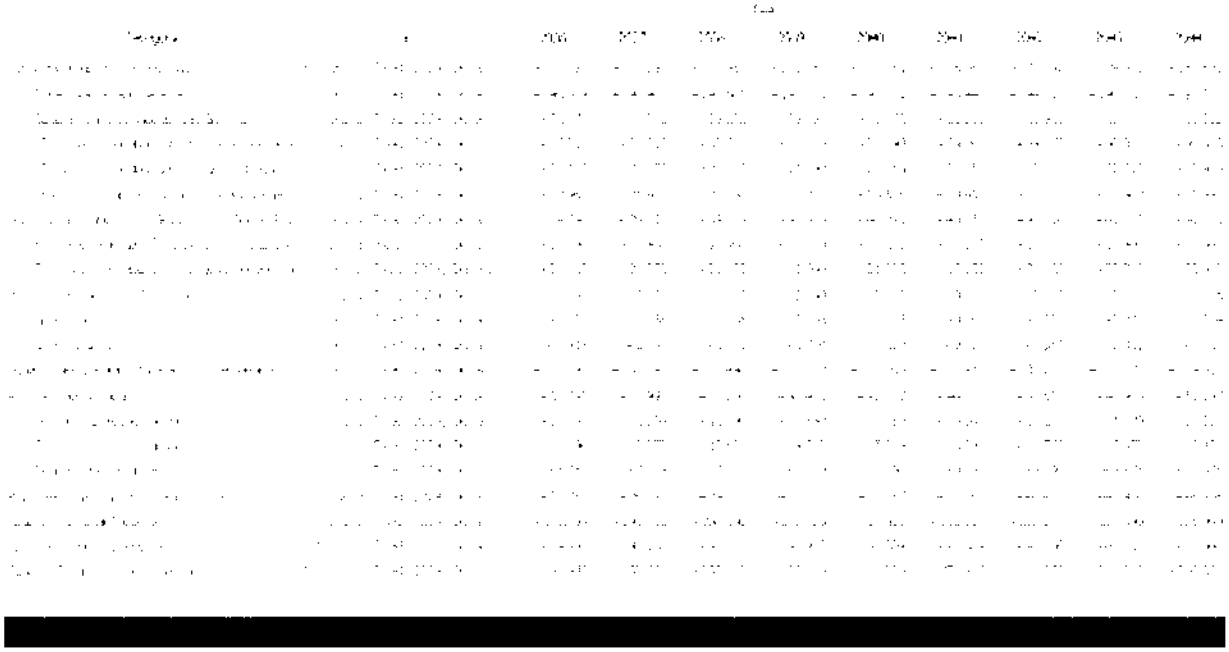
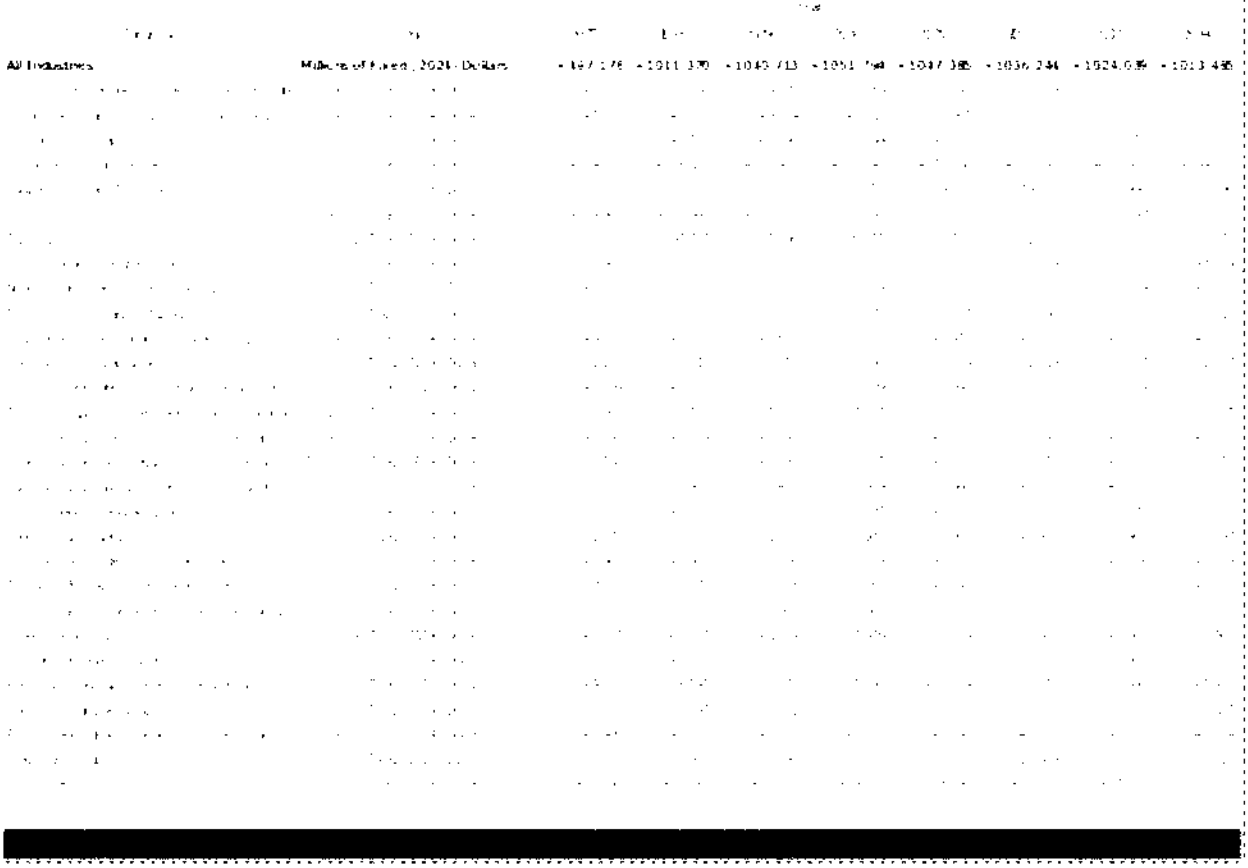
MATS rulemaking impacts - Income Profile



MATS rulemaking impacts - Output



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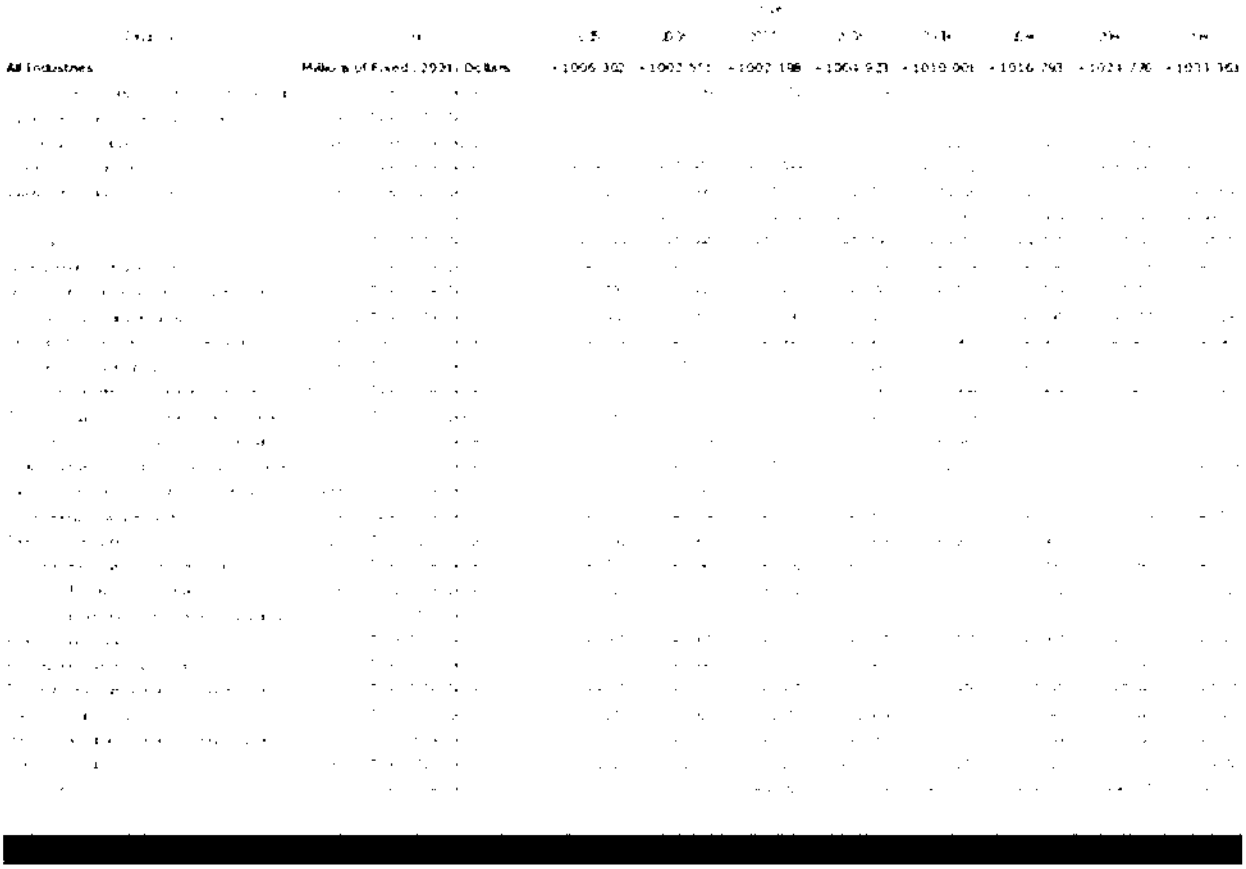
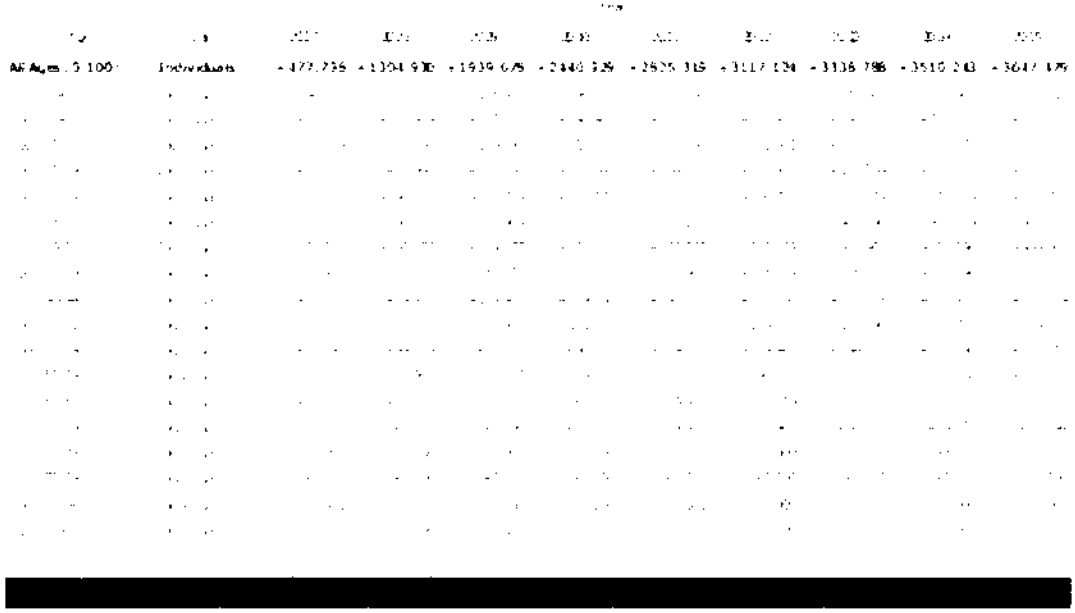


MATS rulemaking impacts - By Age



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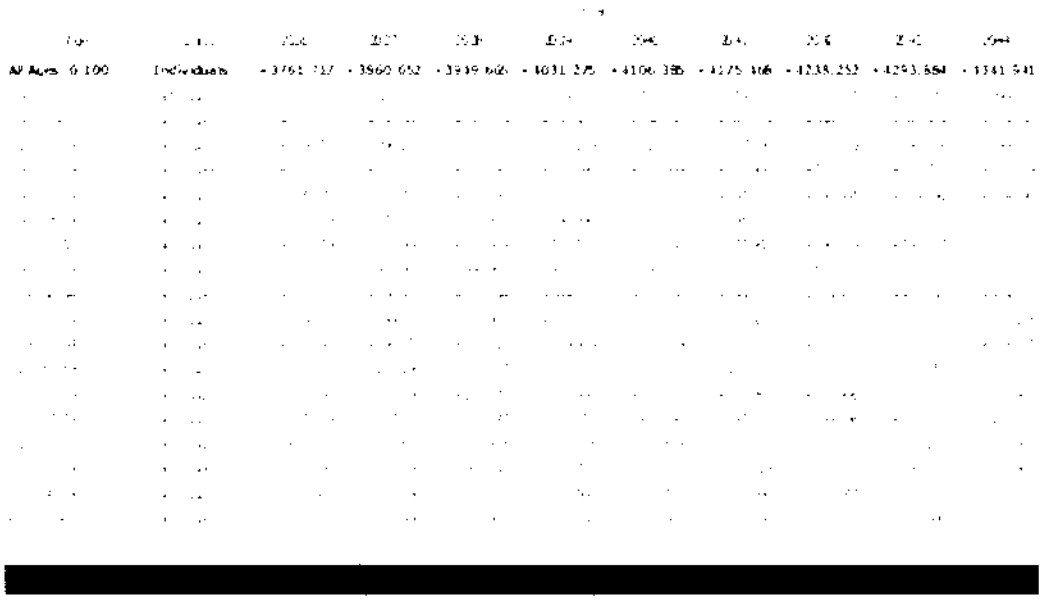
MATS rulemaking impacts - By Age



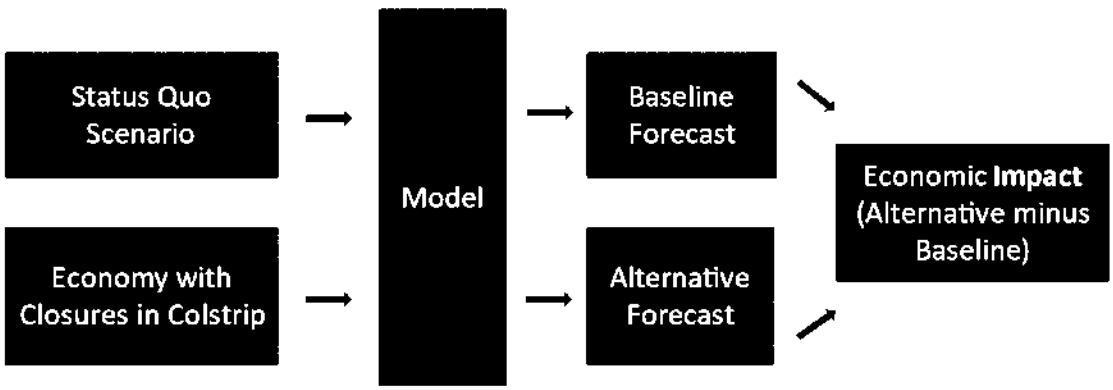
Category: Montana - Race: Population - Gender: All Races - Comparison Type: Total - Forecast: Differences - Comparison Forecast: MATS rulemaking impacts

Appendix B
Description of the REMI Model

The REMI Modeling Methodology

The basic approach of using the REMI model to produce the results for this study is illustrated in Figure B.3, below. The analysis started with a baseline projection for the Montana economy, where the Colstrip SES and Rosebud Mine are present. Next, the analysis employed the REMI model a second time, simulating an alternative scenario where the two facilities are closed and their associated economic activity are absent from the Montana economy.

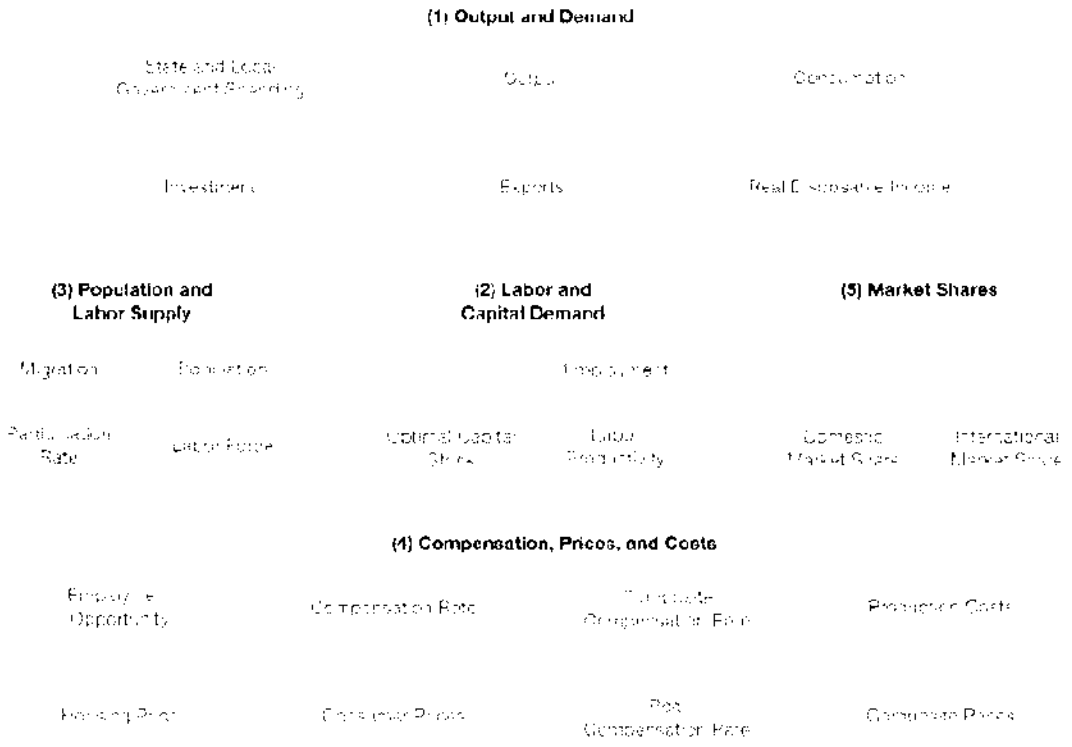
Figure B.3. Policy Analysis Using the REMI Model



The difference between the two economic projections represents the economic impact of MATS-induced rulemaking in Montana.

The REMI model utilizes historical data on production, prices, trade flows, migration, and technological advances to calibrate the relationship between five basic blocks of the state economy: 1) Output and Demand; 2) Labor and Capital Demand; 3) Population and Labor Supply; 4) Compensation, Prices and Costs; and 5) Market Shares. These linkages are shown in Figure B.4, below.

Figure B.4. Schematic Model of REMI Linkages



The differences in production, labor demand, and intermediate demand associated with the closure of the Colstrip SES and the Rosebud Mine impact these blocks, causing them to react to the changes and adjust to a new equilibrium. This new equilibrium constitutes the alternative scenario referred to above the closure of the facilities.

The underlying philosophy of the REMI model is that regions throughout the country compete for investments, jobs, and people. When events occur in one region, they set off a chain reaction of events across the country that causes dollars to flow toward better investment and production opportunities, followed over time by workers and households toward better employment opportunities and higher wages.

The REMI model consists of an 70-sector input/output matrix that models the technological inter-dependence of production sectors of the economy, as well as extensive trade and capital flow data. Together, these components enable the estimates of the shares of each sector's demand that can be met by local production. Simplified illustrations of the schematic model in Figure B.4 are provided on the following pages, in figures B.3 through B.7.

Figure B.5. Output Linkages

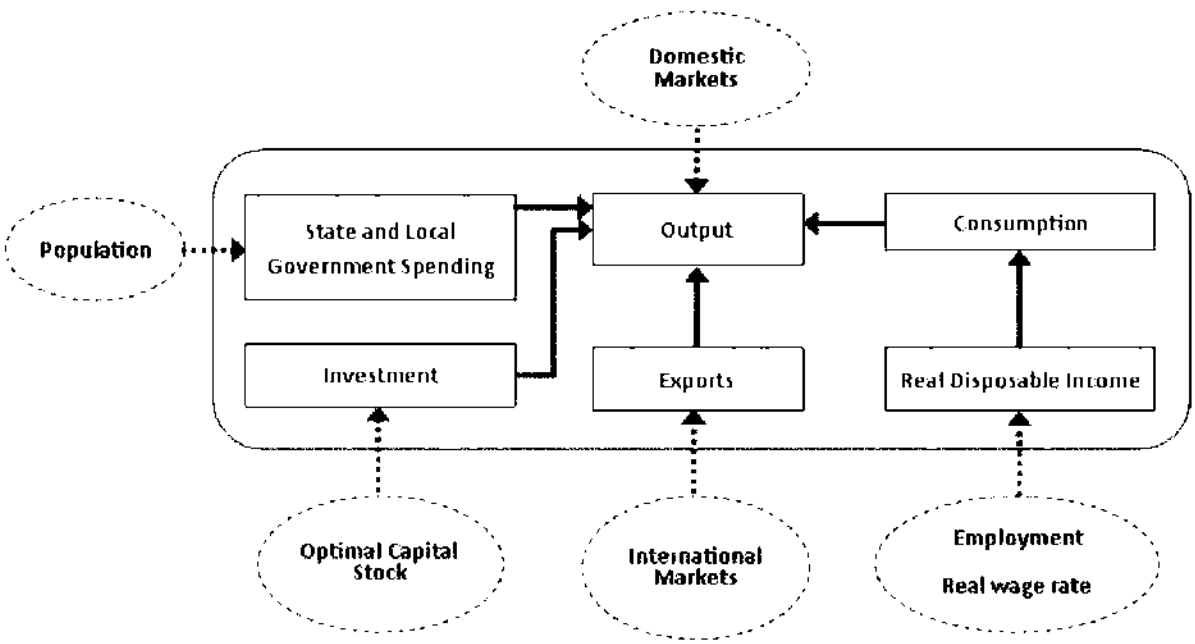


Figure B.6. Labor and Capital Demand Linkages

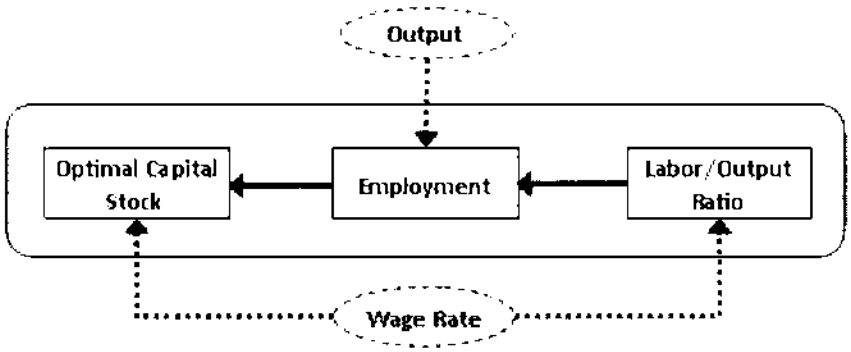


Figure B.7. Demographic Linkages

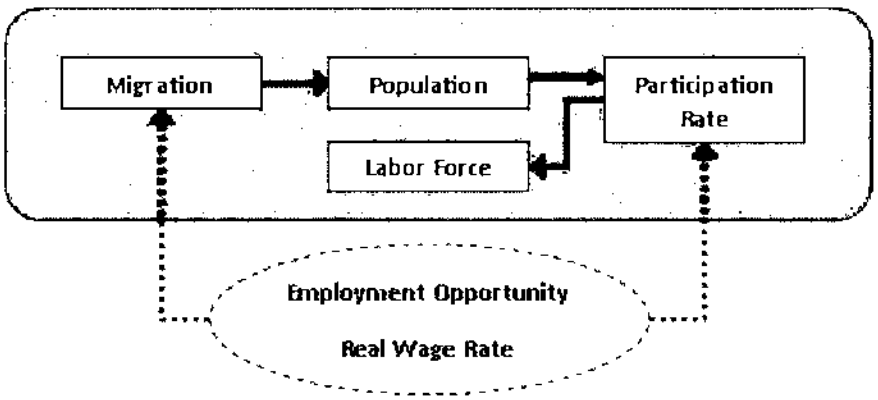


Figure B.8. Wages, Prices and Production Costs Linkages

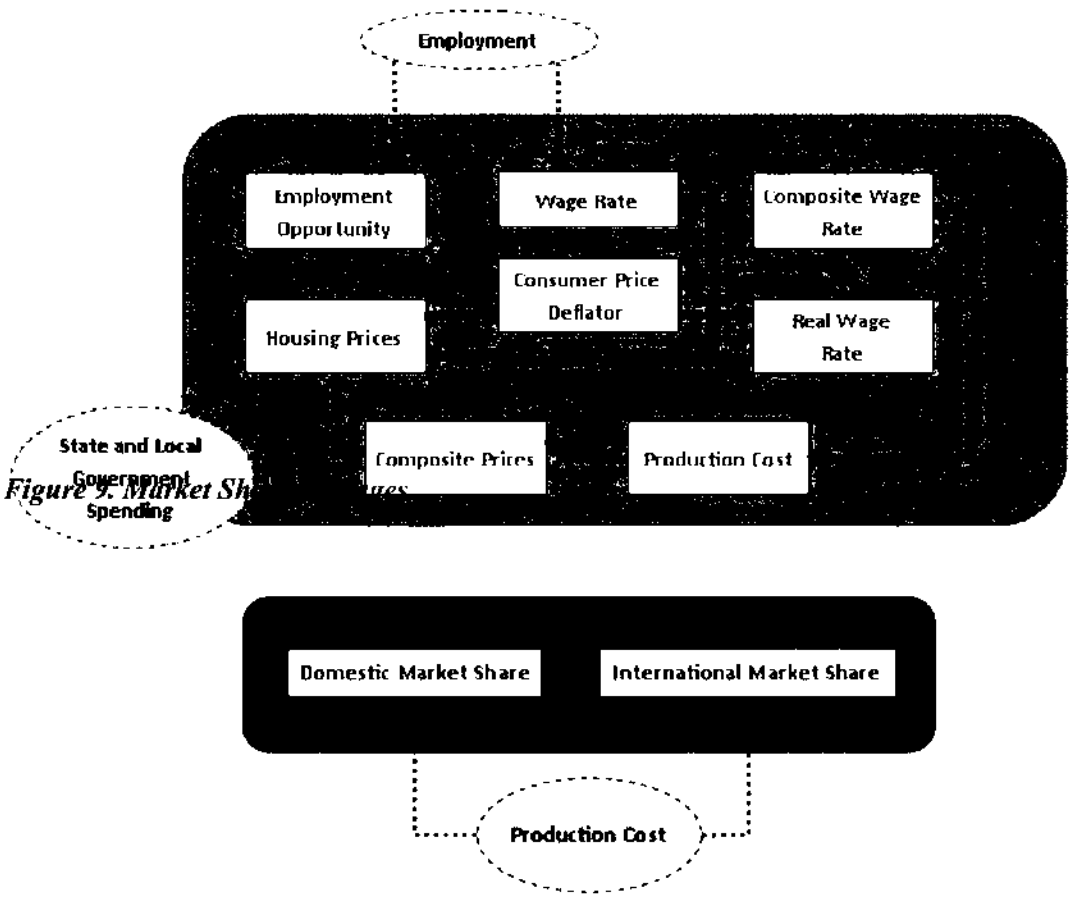


Figure 9. Market Sh

As powerful and flexible as this tool is, the output it provides is only as good as the inputs provided. The majority of the work for this study was to carefully craft the inputs used to construct a scenario for the economy that faithfully represents all of the events, income flows, and the direct and indirect activity that would occur in the event that the Colstrip SES and the Rosebud Mine were closed in mid-2027.

Exhibit 4

Hines Declaration

("Exhibits" referenced in the Declaration have been excluded)

Declaration of John D. Hines
In Support of Petitioners' Motion to Stay Final Rule

I, John D. Hines, having been duly sworn and upon my oath, hereby declare and state as follows:

1. My name is John D. Hines and I am NorthWestern Corporation d/b/a NorthWestern Energy's ("NorthWestern") Vice President – Supply, Environment and Montana Government Affairs. I have been the executive responsible for NorthWestern's energy supply since 2011 and have worked in the energy industry since 1989.

2. I am over the age of 18 and I make this Declaration based on my personal knowledge.

3. As NorthWestern's Vice President Supply, Environment and Montana Government Affairs, I am responsible for ensuring that NorthWestern has the power generation resources required to meet the electrical power needs of its customers reliably, affordably, and safely in a sustainable manner consistent with all applicable laws and regulations. As part of my responsibilities, I oversee NorthWestern's resource planning function and the development of NorthWestern's Electric Supply Resource Procurement Plans as required by Montana law and operations of our generation fleet and a marketing function that buys and sells electricity depending on the status of the portfolio. I am also responsible for lands management, permitting, and environmental compliance, as well as NorthWestern's governmental affairs in Montana.

4. On June 23, 2023, NorthWestern provided comments to the United States Environmental Protection Agency ("EPA") on the Proposal on National Emissions Standards for Hazardous Air Pollutants: Coal and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review, published in the *Federal Register* on April 24, 2023, at 88 Fed. Reg. 24,854 ("Proposed MATS2 Rule" (referred to as "MATS2" because it is a

revision to the original MATS Rule promulgated in 2012). I assisted in the development of these comments ("NorthWestern MATS2 Comments")). A copy of the NorthWestern MATS2 Comments is attached as Exhibit A.

5. On August 8, 2023, NorthWestern also provided comments on the New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule. The proposal was published in the *Federal Register* at 88 Fed. Reg. 33,240 (May 23, 2023). I assisted in the development of these comments ("NorthWestern GHG Rule Comments"). A copy of the NorthWestern GHG Rule Comments is attached as Exhibit B (omitting exhibits that are duplicative of the exhibits to the NorthWestern MATS2 Comments).

6. On December 20, 2023, NorthWestern also provided comments on the Initial Regulatory Flexibility Analysis ("IRFA") on reliability concerns arising from EPA's proposed New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units ("EGUs"); and Repeal of the Affordable Clean Energy Rule. The rule proposal was published in the *Federal Register* at 88 Fed. Reg. 33,240 (May 23, 2023) ("Proposed Rule"), and the solicitation for supplemental comments on the IRFA was published in the *Federal Register* at 88 Fed. Reg. 80,662 (Nov. 20, 2023) ("NorthWestern Supplemental Reliability Comments"). I assisted in the development of the NorthWestern Supplemental Reliability Comments, and I also provided a declaration in support of the comments. A copy of the NorthWestern Supplemental Reliability Comments is attached as Exhibit C (again omitting exhibits duplicative of those in Exhibits A and B).

7. For this Declaration, I reiterate the primary points from the earlier comments and provide additional updated facts. I have also evaluated the changes from the Proposed MATS2 Rule to the final rule announced on April 25, 2024 and published in the Federal Register on May 7, 2024, "National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review" 89 Fed. Reg. 38,508 (May 7, 2024) ("MATS2 Rule"). The MATS2 Rule is a complex regulation that NorthWestern continues to evaluate.

8. Nevertheless, there are certain conclusions that can be drawn at present regarding the impacts of the MATS2 Rule on NorthWestern, its customers, and the rate paying citizens of Montana. My comments here focus principally on the implications of the MATS2 Rule on the future of NorthWestern's ownership share in the Colstrip Steam Electric Station, located in Colstrip, Montana ("Colstrip") and thus the potential effects on our portfolio. Presently NorthWestern owns 222 MW and starting in 2026 it will acquire an additional 222 MW for a total of 444 MW of capacity in Colstrip Units 3 & 4. Colstrip Units 3 & 4 are coal-fired electric generating units ("EGUs"), and other than small waste-coal units not relevant to the MATS2 Rule, the only coal-fired EGUs in NorthWestern's Montana electric generation portfolio.

9. In this Declaration, I make the following points:

a. NorthWestern has analyzed various potential closure dates for Colstrip through its public Integrated Resource Planning ("IRP") process. Prior to the finalization of the GHG Rule and MATS2 Rule, NorthWestern had planned for reliance on Colstrip through 2042. Finalization of the GHG and MATS2 Rules creates two additional closure scenarios: July 8, 2027 (when compliance with the MATS2 Rule is required, unless the State grants a one year extension), and January 1,

2032 (when, under the GHG Rule, existing coal-fired EGUs must close if they have not installed carbon dioxide capture, utilization, and storage ("CCUS")).

b. Installation of additional controls at Colstrip to meet the 0.010 lb/MMbtu filtered particulate matter ("fPM") standard in the MATS2 Rule would require extremely large capital investments and annual operating costs, neither of which are cost-effective under the 2032 Colstrip closure scenario. The additional costs associated with the GHG Rule are so large that NorthWestern cannot envision operating Colstrip beyond January 1, 2032, in the event the GHG Rule is not vacated.

c. Because the additional MATS2 controls are substantial and not cost-effective, it is not clear that NorthWestern can obtain rate recovery approval from the Montana Public Service Commission ("MPSC") for the costs.

d. If NorthWestern cannot obtain rate recovery, NorthWestern will directly experience material irreparable harm.

e. Even if NorthWestern can obtain rate recovery, the costs will result in material increases in electricity rates for Montana ratepayers, to no environmental or incremental power benefit.

f. Because of these uncertainties and risks, NorthWestern is seeking advance rate recovery approval for MATS2 Rule compliance costs from the MPSC, but NorthWestern will not know the outcome of that proceeding before binding commitments must be made to meet the applicable compliance deadline.

g. NorthWestern cannot develop replacement electrical generation or transmission capacity for Colstrip under either the 2027 or 2032 closure scenarios.

h. Closure of Colstrip under either the 2027 or 2032 closure scenarios will materially impair Montana electrical grid reliability and our ability to reliably serve our customers.

i. EPA has not articulated an identifiable path to extend Colstrip's life beyond January 1, 2032. EPA has misinterpreted the various legal and administrative authorities it claims could provide relief from the MATS and/or GHG Rules, absent a stay of both Rules.

These points are discussed in further detail in the remainder of this Declaration.

Colstrip lifespan and closure scenario in the absence of the MATS2 Rule

10. Colstrip Units 3 & 4 have been in operation since 1984 and 1986, respectively. Although the Units have been well maintained and are capable of years of continued operations, they are in the latter stages of their operational life, which factors into the economic justification for major capital investments. NorthWestern in its current Montana resource planning has forecasted Units 3 & 4 would cease operation in 2042.

11. This forecast was significantly influenced by several factors. First, replacement capacity has long planning, permitting, and construction times. Second, there are promising developing alternatives to baseload fossil fuel energy sources, but these require additional time to mature. Third, and critically in relation to the MATS2 Rule, EPA found as recently as 2020 that further controls on Hazardous Air Pollutants were not warranted to protect human health, and there had been no developments that would warrant further controls. Consequently, NorthWestern could reasonably focus on improving and integrating its renewables portfolio and investing in similar infrastructure needs without the immediate need to replace Colstrip's capacity or budget for major additional pollution controls.

12. In fact, in early 2023 (prior to announcement of the Proposed GHG and MATS2 Rules), NorthWestern and Avista Corporation ("Avista") entered into an agreement whereby NorthWestern will acquire Avista's 222 MW combined shares of Colstrip Units 3 & 4 ("Avista Agreement"). NorthWestern determined that acquisition of additional Colstrip capacity was needed to address ongoing reliability and supply needs, for the reasons detailed later in this Declaration.

Extent of compliance Investments and cost-effectiveness of the MATS 2 Rule

13. In its NorthWestern MATS2 Comments, NorthWestern joined Talen Montana, LLC's ("Talen") contemporaneous comments that compliance with the 0.010 lb/MMbtu standard would require the installation of a new baghouse, in the most likely configuration (Reheat Fabric Filter) at an estimated cost of $350 million in capital and $15 million in annual operational/maintenance costs, annualizing to $57 million per year under an assumed 15 year operational life. This contrasts with EPA's original estimate of $38 million/year. I have seen no meaningful rebuttal of Talen's cost estimates from EPA.

14. NorthWestern and Talen further commented that the combination of the MATS2 Rule and GHG Rule would, given today's technology, force early closure of Colstrip. Assuming that Colstrip obtains the one-year compliance extension allowed for in the final MATS2 Rule, which can only be granted if reasonable progress is being made on installing the emission controls, Colstrip would need to come into compliance by July 8, 2028. Further, under the final GHG Rule, Colstrip would need to come into compliance with the GHG Rule's CCUS requirements or close by December 31, 2031. Consequently, if Colstrip closes by December 31, 2031, then the costs of the MATS Rule would be amortized over less than 3.5 years, rather than the 15 assumed by EPA. Even accounting for the reduced years of operational and maintenance

expenses, annualized costs would soar to approximately $120 million under Talen's cost estimates.

15. NorthWestern cannot envision a scenario in which it could operate Colstrip beyond December 31, 2031, if the GHG Rule is not vacated. As stated in NorthWestern's GHG Rule Comments, CCUS is not sufficiently demonstrated to provide confidence that the required GHG control rates could be reliably achieved, and even if they were, the costs of compliance would be astronomical in relation to Colstrip's remaining useful life. In addition, even if NorthWestern were to propose implementing CCUS to extend the life of Colstrip beyond 2031, there is a high likelihood the MPSC would conclude the investment would be imprudent and deny cost recovery. For these reasons, in this Declaration I principally examine and contrast various MATS2 implementation scenarios through 2031.

16. Under the applicable Ownership and Operation Agreement for Colstrip Units 3 & 4 and the Avista Agreement, NorthWestern would bear 30% of the MATS2 compliance costs. Using Talen's cost estimates, this translates to $36 million in new annualized costs for NorthWestern alone for the short period the fPM controls would be in use.

17. As explained in Talen's comments on the MATS2 Rule, the MATS2 Rule would result in extraordinary costs per ton of $92,000/ton for fPM removal for a Reheat Fabric Filter operating from EPA's 0.0195 lb/MMbtu performance baseline. Per-ton compliance costs would more than double with a 2031 closure date. I further note that Montana has more stringent mercury emission standards than the MATS2 Rule, and Colstrip already complies with the Montana mercury standard. Consequently, the MATS2 Rule will provide no material benefit with regard to Colstrip's mercury emissions.

The MATS2 Rule will materially increase electricity-delivery costs in Montana, and it is uncertain whether those will be recoverable in electrical rates

18. As a regulated utility, NorthWestern can only charge electricity rates to customers approved by the MPSC, after the completion of statutory and administrative processes. Mont. Code Ann. § 69-3-101; *see also id.* § 69-3-302; Admin. R. Mont. 38.5.101, *et seq.* The MPSC supervises, regulates, and controls public utilities, including NorthWestern. Mont. Code Ann § 69-3-102.

19. The processing of a proposal to increase electricity rates is referred to as a "rate case" or "rate review." Under general utility regulation law and ratemaking principles, any utility capital investment or facility must be used and useful to the rate paying public before a regulatory commission may permit a utility to recover costs through customer rates for the investment. Further, any cost or investment must be determined by the regulatory authority to be prudently incurred before cost recovery is authorized. With some limited exceptions for common recurring costs, such as supply costs or property tax adjustments, NorthWestern must apply to the MPSC in a formal rate review to recover any costs already incurred. NorthWestern often experiences what is known as "regulatory lag," where the company cannot timely recover costs for important investments made which serve customers and help provide safe, reliable, and affordable energy. This delay happens between rate cases, which are expensive and extremely resource consumptive to undertake. In recent years, NorthWestern has experienced harm from regulatory lag and has argued and demonstrated to the MPSC that the company's creditworthiness is impacted by delays in cost recovery.

20. NorthWestern began scoping its last rate case in 2021 and filed the case in in August 2022, based on investments made up through 2021. *See* MPSC Docket No. 2022.07.078 ("2022 Rate Case"). There were more than 600 docket entries in the administrative record over the course of the 2022 Rate Case, including thousands of discovery requests, a deposition, a six-

day-long evidentiary hearing, motions for summary judgment, an on-site audit, motions for reconsideration after the MPSC's decision, and additional proceedings. The Commission issued its order on reconsideration in the 2022 Rate Case in early 2024.

21. At the conclusion of the 2022 Rate Case, the MPSC approved a 28% increase in residential electricity rates. NorthWestern is relatively small utility, with a Montana electric customer base of approximately 400,000. Tens of millions of dollars in new capital and operating costs has a material effect on Montana electricity rates. A substantial annualized increase in compliance costs attributed to the MATS2 Rule would be presented to the MPSC to be added to rates. Importantly, to the extent that NorthWestern needs to purchase additional electricity from other Colstrip owners during periods of high demand, the MATS2 Rule costs would be reflected in their market rates as well.

22. Even assuming NorthWestern would close Colstrip by December 31, 2031 to avoid the exorbitant costs associated with the GHG Rule, NorthWestern is facing other substantial electricity-related costs through 2031. These include continued investments in much-needed transmission to accommodate increased renewable generation, wildfire mitigation initiatives, and rate recovery for other ongoing capital and operational projects. During this period, it is reasonably foreseeable that other rate increases will be needed to cover other electricity-related costs. In that context, MATS2 Rule implementation costs would be punitive to ratepayers, especially those of lesser means.

23. Conversely, if the MPSC denies rate recovery for MATS2 Rule compliance costs, $120· million in non-recoverable costs, with the capital component incurred over the next four years, would have a material impact on NorthWestern's financial viability.

24. NorthWestern is commencing a new rate case in July, 2024. Because of the high consequences of the MATS2 Rule, NorthWestern will be asking the MPSC for an accounting mechanism to address MATS2 Rule compliance costs. Given required statutory and administrative processes and prior experience, it is not plausible that this proceeding will be completed prior to the date by which binding commitments are necessary to install the required controls in time to meet the 2027 or 2028 compliance deadlines. The decision points and timelines associated with fPM control contracting and installation are discussed in more detail in the declaration of Dale Lebsack. NorthWestern and its rate paying customers therefore face financially significant uncertainty no matter how the MPSC ultimately rules. If the MPSC allows rate recovery, then the rate paying public will face substantial electric rate increases. If the MPSC does not, then NorthWestern could be financially devastated. And NorthWestern cannot know the answer before the investment decisions must be made.

Electric grid reliability consequences of closure of Colstrip by the end of 2031 or earlier

25. One option to avoid the preceding conundrum would be to simply close Colstrip by the MATS2 Rule July 2027 compliance date. But closure of Colstrip prior to the mid-2030s, and especially by mid-2027, would create other types of potentially catastrophic and irreparable risks and harms.

26. NorthWestern addressed the electrical grid reliability implications of early closure of Colstrip in its NorthWestern MATS2 Comments, its NorthWestern GHG Rule Comments, and its NorthWestern Supplemental Reliability Comments.

27. In simplest form, when Colstrip is closed its generating capacity must be replaced. Capacity can be replaced in one of two principal ways: (1) new generation facilities can be built, or (2) electricity can be purchased from third-parties in the electricity market. Existing Montana

sources of market electricity purchases are either fully utilized, or equally affected by the MATS2 Rule (in the case of the shares of Colstrip Units 3 & 4 that are not owned by NorthWestern). The following paragraphs discuss NorthWestern's portfolio and its ability, or the lack thereof, to replace Colstrip's capacity with new generation or increased transmission from other sources.

28. NorthWestern and its South Dakota affiliate supply electrical energy and capacity to customers in Montana, including Yellowstone National Park and South Dakota. This Declaration focuses on Montana. As explained in the accompanying prior Declaration of Michael Cashell, NorthWestern's Vice President – Transmission (the content of which was included in the NorthWestern MATS2 Comments and submitted again in declaration form as Exhibit B to the NorthWestern Supplemental Reliability Comments), generation sources in Montana and the Dakotas are located in different Interconnection Regions, and electricity cannot readily be transmitted between the two Regions. NorthWestern provides electricity to customers in its Montana service area and also serves as the "Balancing Authority" in that part of Montana, which means that NorthWestern is responsible for ensuring that the supply of and demand for electricity within its Balancing Authority Area are constantly in equilibrium or "balanced."[1]

29. The MPSC has set forth the following objectives that Montana utilities should meet: (a) reliability; (b) affordability; (c) environmental responsibility; (d) optimality; and (e) transparency.

[1] In its South Dakota service area, NorthWestern participates in the Southwest Power Pool ("SPP"), which is a Regional Transmission Organization serving as a single Balancing Authority for interconnected electric utilities in 14 states. In 2015, NorthWestern ceded functional control of its South Dakota transmission facilities, and SPP is now responsible for operating the grid.

30. NorthWestern thus has legal obligations to reliably and affordably supply electricity to our customers in Montana and to do so cost-effectively while seeking to reduce adverse environmental impacts. In addition to those legal obligations, NorthWestern recognizes that as a practical matter its customers count on NorthWestern to provide the cost effective electricity used to power their homes and businesses and the critical infrastructure upon which they rely.

31. Under Montana law, NorthWestern, as a regulated public utility, is required to prepare and file a plan every three years for meeting the requirements of its customers in the most cost-effective manner consistent with its obligation to serve under the law. Mont. Code Ann. § 69-3-1204(1)(a).

32. The plan must include:

a. an evaluation of the full range of cost-effective means for the public utility to meet the service requirements of its Montana customers, including conservation or similar improvements in the efficiency by which services are used and including demand-side management programs in accordance with 69-3-1209;

b. an annual electric demand and energy forecast developed pursuant to commission rules that includes energy and demand forecasts for each year within the planning period and historical data, as required by commission rule;

c. assessment of planning reserve margins and contingency plans for the acquisition of additional resources developed pursuant to commission rules;

d. an assessment of the need for additional resources and the utility's plan for acquiring resources;

e. the proposed process the utility intends to use to solicit bids for energy and capacity resources to be acquired through a competitive solicitation process in accordance with 69-3-1207; and

f. descriptions of at least two alternate scenarios that can be used to represent the costs and benefits from increasing amounts of renewable energy resources and demand-side management programs, based on rules developed by the commission.

33. Planning for reliable service requires NorthWestern to ensure that it has enough electricity generation resources to meet its customer demands every hour of the year, even with changing weather, generation output and demands. As a matter of physics, for the electric grid to operate reliably, the amount of energy generated ("generation") and the consumption of that energy ("load") must be equal or in balance. Generation and load must be in balance year-to-year, month-to-month, day-to-day, hour-by-hour, and minute-by minute for the electric grid to remain stable. Because of the long lead times needed to build or acquire new electrical generation or transmission assets or negotiate power purchase contracts, NorthWestern, like other electric utilities, makes plans for our supply of electricity years in advance. This long-term IRP is also required by law. In Montana, NorthWestern prepares formal, written plans that are filed with the MPSC. *See* NorthWestern MATS2 Comments, Exhibit D (NorthWestern May 2023 Integrated Resource Plan).

34. NorthWestern began to serve customers in Montana when it purchased transmission and distribution assets of the former Montana Power Company in 2002. Initially, NorthWestern did not own any generation assets to serve Montana customers. This situation was not ideal and was risky to customers as it required NorthWestern to purchase from the market all

the electricity needed to serve customers. These purchases were and continue to be from a market that reflects growing risk to customers and that has increasingly volatile pricing and potential supply shortages. These purchases also rely upon adequate transmission to move the electricity from the place of purchase to NorthWestern's transmission and distribution systems. Availability of such transmission presents yet another risk to greater reliance on market purchases.

35. Since 2002, NorthWestern has acquired various types of electricity supply resources, including its interests in Colstrip. Notably, in 2014 NorthWestern purchased a portfolio of hydroelectric facilities in Montana. NorthWestern has also made significant investments in wind power. NorthWestern has more wind owned and under contract than its existing share of generation from Colstrip and the share it is contracted to acquire from Avista. NorthWestern currently owns approximately 882 MW of generation capacity, has under construction or agreements in process for another 392 MW, and has long-term contracts for another 764 MW.

36. NorthWestern's current generation portfolio is a diverse and balanced mix of resources necessary to be reliable, the majority of which are renewable. The portfolio includes 497-MW of hydroelectric maximum delivered capacity, 455-MW of maximum delivered wind capacity, 222-MW of coal capacity at Colstrip, 202-MW of natural gas capacity, 92.5-MW of waste coal capacity (which under PURPA we are required to purchase), and 177-MW of solar capacity. The Company also has market capacity contracts for 410 MWs which have significant price or market exposure. In summary, NorthWestern's current portfolio has 202 MW of natural gas capacity, 315 MW of coal and waste coal based capacity, and 1,128 MW of renewable fueled

generation. As noted, under the Avista Agreement, NorthWestern is also scheduled to acquire ownership of another 222-MW of capacity at Colstrip commencing in 2026.

37. The table below lists NorthWestern's existing owned generation facilities and contracted generation resources along with some additional resources that the Company expects to bring online, including the Yellowstone County Generating Station ("YCGS") that is nearing full operational status and is expected to reliably serve NorthWestern's customers beginning July 1, 2024

MT Portfolio Resources
Thompson Falls
Cochrane
Ryan
Rainbow
Holter
Morony
Black Eagle
Hauser
Mystic
Madison
Turnbull Hydro LLC
State of MT DNRC (Broadwater Dam)
Tiber Montana LLC
+ QF Hydro Resources
Basin Creek
DGGS 1 -3
Yellowstone County Generating Station (Laurel)
Colstrip 30% U4
Yellowstone Energy Limited Partnership (BGI) (QF)
Colstrip Energy Limited Partnership (QF)
Judith Gap Energy LLC
Spion Kop Wind
Two Dot Wind Farm
+QF Wind Resources

+QF Solar Resources
Powerex (3 yr) Contingency Reserves (60 MW) - expires 12/31/2024
Powerex (5 yr) (100 MW) - expires 12/31/2027
Heartland (10 yr) - (150 MW) - expires 12/31/2032

38. NorthWestern currently has over 200 percent more wind generation than Colstrip generation. In terms of generation asset nameplate capacity, its two largest, by far, are hydroelectric assets and the fleet of wind farms, both of which are carbon free. NorthWestern's portfolio of solar generating facilities has also been increasing in recent years. At the same time, it is critical to note the difference between "nameplate" and "accredited" capacity. Nameplate capacity refers to the maximum electrical generating output (in MW) that a generator can sustain over a specified period of time when not restricted by seasonal or other "deratings" (events that reduce effective output), as measured in accordance with the United States Department of Energy standards. In contrast, accredited capacity means the electrical rating given to generating equipment that meets the Utility's criteria for uniform rating of equipment. These criteria include but are not limited to reliability, availability, type of equipment and the degree of coordination between the Distributed Generation and the Utility. Wind and solar accredited capacities are much lower than their nameplate capacities, because of the seasonal and weather variability of those generation sources. Hydroelectric generation also has a gap between nameplate and accredited capacity, reflecting periods when generation is restricted by stream flows. All this is reflected in the table below:

Hydro Generation - Online

Total	497	341
Thermal/Natural Gas Generation - Online		
Total	202	195
Thermal/Coal Generation - Online		
Total	315	309
Wind Generation - Online		
Total	455	109
Solar Generation - Online		
Total	177	11
Short Term Contracts - Max		
	410	410

39. NorthWestern's proportion of generation resources that are renewable compares highly favorable to other utilities. In 2021, 56% of NorthWestern's electric generation was from carbon-free resources, which compares to about 42% generated by the U.S. electric power industry as a whole.

40. Despite the significant improvement in NorthWestern's generation capacity, including acquisitions of hydroelectric plants and wind farms, NorthWestern's resource portfolio of owned resources and long-term contracts is not yet sufficient or "reliable," as defined by regional planning organizations, including the Western Regional Adequacy Program ("WRAP"), of which NorthWestern is a founding member.

41. In periods of peak loads, NorthWestern often does not have sufficient capacity, meaning that NorthWestern must make market purchases of capacity and energy to meet customers' needs.

42. Periods of peak load are those times when customers' demand for electricity is particularly high. This tends to occur during periods of extreme weather, during the coldest winter days (below 10 degrees Fahrenheit) when more electricity is used for heating purposes and during the hottest summer days (above 90 degrees Fahrenheit) when more electricity is used

for cooling. The availability or unavailability of other resources can also be a significant factor. For example, the amount of rain during a season or snow during a preceding winter impacts the generation of our hydroelectric facilities. Similarly, there are periods when more or less wind power is generated. Unfortunately, in Montana this extreme weather typically occurs with high pressure systems, meaning our wind generates very little to zero power during these critical conditions. Those instances when there is both high demand for electricity, due to the extreme temperatures, and less available renewable generation can be particularly challenging from both a reliability and customer affordability perspective. Thus, NorthWestern is forced to rely on a market that has significant price volatility, as a reflection of the scarcity of on-demand generation. There is also increasing concern regarding the scarcity of firm transmission during these extreme weather events.

43. There are significant disadvantages to being reliant on market purchases to manage peak demand periods, especially considering the declining availability of capacity resources in the region.

44. As an initial matter, prices for electricity tend to increase when there is greater demand. Typically, NorthWestern's periods of high demand coincide with those of other utilities in the region. At the same time market prices are increasing during the critical weather events, especially winter, the available wind and solar generation frequently diminishes, sometimes to near zero. The same weather patterns that impact Montana also frequently impact other states in the region. As a result, the demand for electricity is high during such periods, which drives up the prices. Those higher prices increase our costs and ultimately lead to higher bills for customers, which impacts their household and business finances and the broader Montana economy. Importantly, the costs of electricity obtained through power purchase contracts are

substantially passed directly through to consumers. NorthWestern's lower income and smaller business customers tend to be most sensitive to the impacts of increased electric costs.

45. In addition to pricing, there is also the question of availability. Simply put, it is not prudent to assume that there will always be sufficient out-of-state power that can be both purchased and transmitted to Montana. In his Declaration, Michael Cashell discusses the limitations of the transmission system and how those impact NorthWestern's ability to bring electricity into Montana to serve NorthWestern's customers.

46. In brief, Mr. Cashell explains that there is insufficient existing transmission capacity to replace Colstrip's capacity through increased importation of electricity. It is also not plausible to permit and construct significant additional transmission capacity, much less enough to replace lost capacity at Colstrip, prior to the mid-2030's. This was a major driver of the Avista Agreement providing NorthWestern with more reliable, highly-accredited electricity during the bridge period between now and when other sources of electricity to replace Colstrip will be reasonably available.

47. For my part, I will discuss that availability of electricity to purchase, setting aside the increasing uncertainty of whether it can be transmitted to Montana.

48. In recent years, several large power plants in Montana and adjacent states have closed. J.E. Corette, with a 163-MW nameplate capacity, was closed in 2015. Colstrip Units 1 and 2, each with nameplate capacities of 307 MWs, ceased operation in early 2020. That same year, the Boardman plant in Oregon, 601 MWs, and Unit 1 of the Centralia plant in Washington, 730 MWs, both closed. Idaho Power ended its participation in Unit 1 of the Valmy facility, 254 MWs, in 2019 and the operations there completely halted in 2021.

49. In addition to those significant retirements that have already taken place, more retirements are anticipated in the near future. In particular, Unit 2 of the Centralia plant, 670 MWs, is scheduled to cease operation in 2025, as is North Valmy Unit 2, which is 289 MWs.

50. The retirement of these necessary on-demand generation is occurring at the same time forecasters are predicting a significant increase in demand driven in part by electric vehicles and artificial intelligence development.

51. In addition, several existing dams in the Pacific Northwest are being considered for removal, constraining the future availability of hydroelectric resources.

52. In summary, there is much less reliable electrical generation available in Montana and the Pacific Northwest (the market) than in the past, and the closures scheduled for 2025 are expected to result in the loss of an additional 959 MWs of nameplate capacity by the end of that year. Importantly these losses of nameplate capacity are all for facilities for which their accredited capacity is very close to their nameplate capacity. As a result, the regional portfolio is shifting away from high-accredited to low-accredited generation sources. A difficult situation is expected to get worse and grave reliability concerns are no longer just the province of states like California and Texas that have had well publicized blackouts. A recent article by a former Federal Energy Regulatory Commissioner noted that this reliability concern has spread to over two-thirds of the Country. Given these circumstances, Colstrip is a critically important facility for NorthWestern and its Montana customers.

53. Equally importantly in terms of timing and supply, 100 MW of NorthWestern's current market contract capacity will be expiring in the near future. Given the retirements of facilities throughout the region, it cannot be assured that NorthWestern will be able to renew or replace these contracts when they expire, especially under as favorable of terms. To the extent

any can be replaced, market conditions indicate that they will be at much higher costs, which will be passed directly on to our customers.

54. As noted above, NorthWestern engages in long-term electricity supply planning.

55. These historical and upcoming developments have left NorthWestern in a critically tenuous position of potentially not being able to reliably serve its customers' needs during periods of peak loads, such as hot summer and most critically, cold winter days. Reliance upon market purchases is becoming increasingly risky in terms of reliability and affordability and is expensive and uncertain, especially during critical weather events that absent resource sufficiency, places lives at risk. This is in spite of NorthWestern acquiring a substantial amount of generation since 2011.

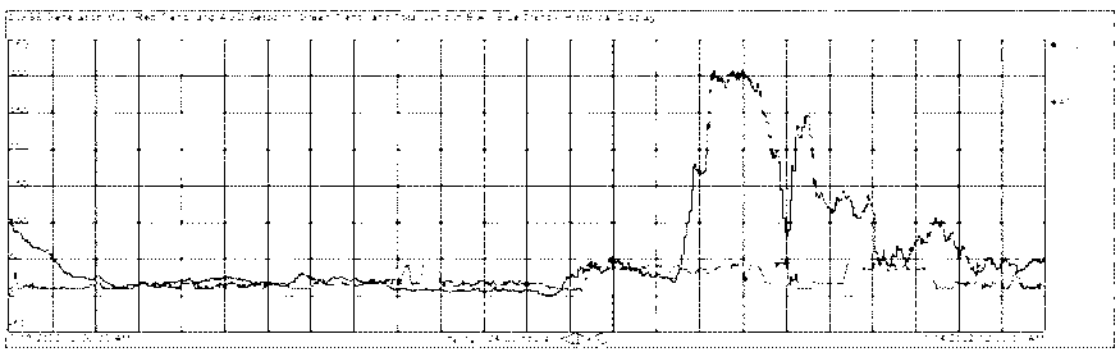
56. Based on those identified needs, NorthWestern issued a Request for Proposals (RFP) in 2020. This RFP was explicitly for **any** type of generation that was able to provide capacity for those three distinct duration categories. This RFP was conducted by an independent and respected third party. NorthWestern was not directly involved in the evaluation process. The Yellowstone County Generating Station – a natural gas fired facility, was selected as providing the best combination of attributes to supplement NorthWestern's portfolio.

57. Wind and solar have some positive attributes as sources of electricity. They do not have fuel costs, do not create emissions, and their capital costs have declined over the past decade (though current inflationary trends and supply chain issues are having large cost and availability impacts, as in other areas of the economy). However, like any other type of electric generation, they also have downsides. In terms of reliably serving our customers, one important disadvantage of intermittent generation renewables is that the amount of electricity they generate varies significantly based on the weather. This is reflected by the previously discussed large

difference between their nameplate and accredited capacities – values determined outside of NorthWestern by regional planning agencies.

58. Battery storage (4 hour duration) is also a tool utilities, especially in the Southwest, are using. This resource works well for helping address daily 4 *hours* of peak demand. Montana's system has a 4 *day* problem wherein the storage would only work for 4/96ths hours. To replicate how storage operates in state like California, NorthWestern would to have 24 times the quantity of storage to serve these events, which is cost prohibitive.

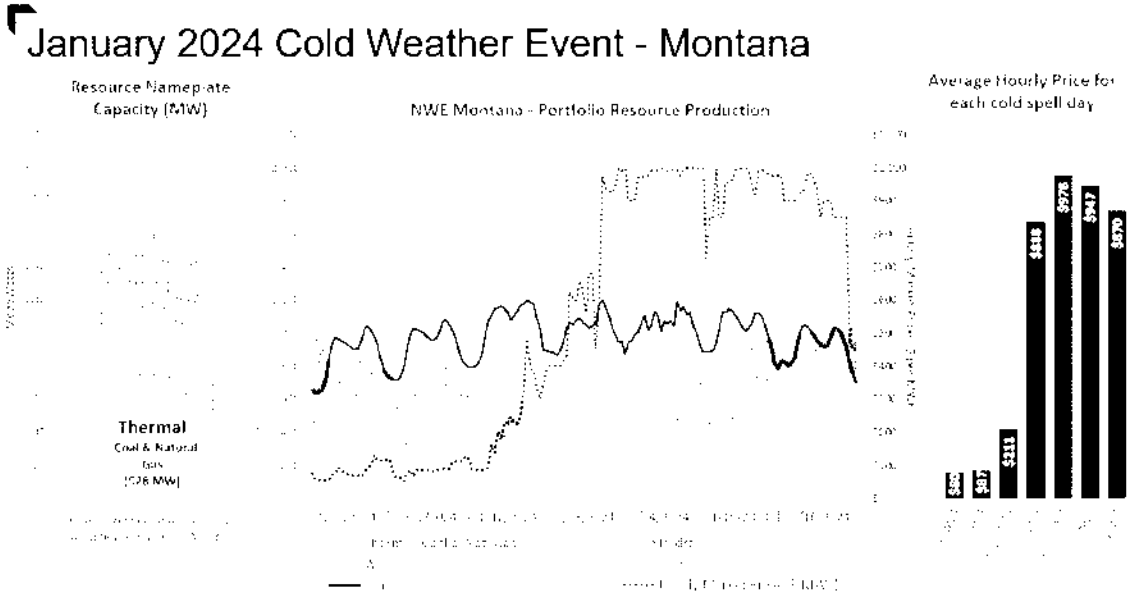
59. To illustrate that point, I have included two charts below. The first chart shows the amount of electricity generation, in MW, over a 24-hour period on July 13, 2022 from (1) all the wind generation resources within the NorthWestern Balancing Authority, which is depicted in blue, and (2) the generation from NorthWestern's Dave Gates Generating Station, depicted in red. The y-axis, with the values in ascending order on the left side, represents MWs of generation. The x-axis represents hours of the day.



60. Focusing on the wind, the chart shows that after about 2:00 am there was little to no electricity from wind generation on the system until the afternoon. Then, following a slight increase in the early afternoon, wind generation jumped from less than 50 MWs to more than 300 MWs between 3:30 and 4:30 pm. It then declined to less than 100 MWs at 5pm before ramping up again once more between 6:00 and 7:00 pm and then declining. As this example

shows, the amount of electricity generated by wind facilities can quickly and significantly change. NorthWestern, however, must continue to balance at all times the electricity demands of customers with the amount of electricity supplied. This balancing is imperative; deviations between generation and customer demand of relatively tiny percentages for even a small amount of time (seconds to minutes) will lead to system instability, customer equipment damage, and blackouts.

61. During the Winter of 2023-2024, thermal generation, especially Colstrip, played a key role in helping provide reliable and affordable service. The variable cost of operating Colstrip was about $23/MWh. Unfortunately, NorthWestern's customers were subject to extreme market prices from NorthWestern's market contracts. As an example, market contracts cost our customers up to $900/MWh. NorthWestern purchased about $40 million of power during this 6 day critical weather period, which had wind and solar underperforming, even less than their accredited capacity.



Once again during the recent cold spell (1/10/24 to 1/16/24), energy prices surged when wind and solar weren't providing capacity. And once again, NorthWestern had to be dependent on the market to meet customer needs, with the average price of a megawatt hour over $900 for the last 4 days (13th-16th) of the cold spell.

62. As of December 8, 2023 future prices for heavy load electricity for the months of July, August and September, 2024 are trading at $130, $180, and $136 per MWh respectively. Further contracted prices have ranged from $200 to $900 per MWh during recent peak events. The actual cost for purchasing electricity in December 2022 was around $250 per MWh; for the three highest load days (December 21-23), the actual purchase cost averaged about $440/MWh. To provide a simplified illustration of the impact of such a potential difference in cost to serve customers, consider a hypothetical three-day event during which NorthWestern's share of Colstrip would produce about 15,000 MWh. If the difference between the market price and the variable cost of Colstrip is $400/MWh, the cost of market purchases for the three day period would be about $6 million more than the cost of generation ($400 x 15,000 MWh = $6 million). Such extra costs of a contracted capacity resource would be passed on to customers.

63. My statements in the preceding paragraphs assume that a capacity contract is even available. However, I stress again that this may not be the case given the recent and planned

closures of multiple plants in neighboring states. I also do not believe that transmission would be available even if we located a source from which we could purchase capacity (especially with the closure of Colstrip), which Michael Cashell addresses in his Declaration.

64. As undesirable as it would be for NorthWestern to have to purchase capacity on the market as an alternative to Colstrip, the scenario in which we are not able to obtain needed capacity (and/or are not able to obtain transmission for such capacity) is much worse. Under this scenario, the possibility of rolling blackouts during periods of extreme weather becomes more likely. The rolling blackouts in California during the summer of 2020 and the multi-day blackout in much of Texas during February, 2021 show that utility systems in the United States can experience significant and damaging capacity shortfalls. During the cold snaps in the winters of 2022-23 and 2023-24, the Montana electrical grid was stressed to the maximum. A significant transmission or supply generation resource failure would have likely led to being unable to serve customers.

65. Equally importantly to the raw amount of electricity available, Colstrip plays a critical voltage-maintenance function. Closure would therefore require major investments in voltage maintenance, independently of the concerns about market electricity availability and transmission capacity. These concerns are discussed in more detail at page 59 of the 2023 IRP.

66. If NorthWestern is not allowed to obtain the capacity it needs, customers and communities could also suffer from blackouts. Blackouts cause serious property damage, business disruption, and even death. It is estimated that approximately 250 people died in Texas as a direct consequence of the 2021 power disruptions. This was when temperatures were in the teens. This past January our Montana service territory experienced temperatures as low as -45°F in our towns. Rural areas likely experienced even colder temperatures.

67. Customers rely on electricity to power their health care and other personal devices, cool their homes, heat some homes (often our lower-income customers living in mobile homes and apartments with electric baseboard heating), and power important infrastructure, including gas pumps. Natural gas appliances also rely on electricity for ignition and, in the case of forced air furnaces, fans.

68. Even when customers have generators, as some critical infrastructure customers do, there is a limit to how much fuel is stored on site at each individual location. These factors all contribute to a significant environmental justice component to reliable electrical supply.

69. NorthWestern also cannot realistically construct 444 MW of new capacity in Montana to replace our current and future (starting in 2026) interest in Colstrip by the MATS2 compliance date of July 2027. This arises from both timing and regulatory constraints. From a timing perspective, it takes several years to bring new generation on-line. As illustrated by YCGS – the most recent significant generation project – the YCGS development process commenced in 2019 and YCGS is only now coming on-line. 444 MW of capacity would be more than double YCGS and correspondingly more difficult to construct and permit.

70. Additional renewables would not reliably replace Colstrip, because of the associated intermittency issues. Additional coal capacity is infeasible for the same reasons as will result in result in shutdown of Colstrip by the end of 2031 under the GHG Rule. And additional natural gas capacity is problematic, both because of the CCUS requirements on new natural capacity under the GHG Rule, and because there is insufficient natural gas supply and pipeline capacity in Montana to bring hundreds of additional MW on line by the end of 2031, much less mid-2028.

71. NorthWestern is seriously examining using a small nuclear facility as a long-term facility to replace Colstrip, but no such facility presently has been constructed or can realistically be constructed and operational prior to the mid-to-late 2030s, at the earliest.

72. For the foregoing reasons, Colstrip's capacity cannot reasonably and timely be replaced prior to the mid-2030's. Closure of Colstrip before then would create significant grid reliability risks in Montana.

EPA's Responses to NorthWestern's Comments on the MATS2 Proposed Rule were incorrect or non-responsive.

73. NorthWestern made all the reliability-oriented points discussed in Paragraphs 23-71 in its NorthWestern MATS2 Comments. EPA very briefly responded to these concerns on pages 52-53 of EPA's "Summary of Responses to Comments and Reponses on Proposed Rule." (EPA-HQ-OAR-2018-0794-6922). The entirety of EPA's response is the following:

> Regarding comments about the impact of closing Colstrip on reliable electrical service, facilities may request an additional time extension through the Department of Energy under the Federal Power Act section 202(c), which are made on a case-by-case basis based on a substantial need for grid reliability. In addition, as other commenters have noted, NorthWestern Energy has recently joined the Western Resource Adequacy Program ("WRAP"), a regional reliability planning and compliance program in the West.

74. Turning first to EPA's observation that NorthWestern has joined WRAP, this is a correct statement, as discussed in detail in NorthWestern's 2023 IRP at Section 3.4. NorthWestern is a founding member of WRAP, and as the IRP states: "One of the program objectives is to leverage the geographic diversity benefits of the larger region to enhance planning and operations during times of peak energy demand. The ability of WRAP participants to pool and share resources during tight operating conditions is expected to lead to increased reliability and potential savings opportunities." A condition of a utility's ability to even participate in WRAP is a portfolio that can already meet WRAP's reliability criteria. WRAP has

never and in fact specifically excludes the function of serving as a capacity market alternative. It is only intended to provide economic efficiency. None of this changes the fact that NorthWestern is transmission-and-capacity constrained, as is the Western Interconnection. Indeed, NorthWestern's ability to comply with its WRAP commitments is premised on continued operation of Colstrip at least through the mid-2030's. Participation in WRAP does not alter or mitigate any of the consequences of early closure of Colstrip or the cost-effectiveness of compliance with the MATS2 Rule.

75. This leaves EPA's invocation of Federal Power Act section 202(c) ("FPA Section 202(c)"). EPA raised this supposed avenue for a compliance extension to NorthWestern during discussions following the close of the comment period, during the pendency of the Proposed Rule. NorthWestern has reviewed historic examples of the use of Section 202(c), and none are in any way comparable to the compliance issues facing Colstrip and NorthWestern. In all but one historical example, FPA Section 202(c) orders were granted to temporarily waive existing capacity limits or operation of *existing* installed pollution controls. The single historical counter-example dates from twenty years ago, and only provided an emergency exemption for a few months. FPA Section 202(c) has never been used to provide a significant extension to EPA-imposed deadlines on the installation of pollution controls in the first instance. Moreover, in this context an extension that does not take NorthWestern all the way to the GHG Rule end-of-2031 retirement deadline (and thereby allow NorthWestern to avoid installation of the fPM controls altogether) would not result in any significant cost savings, and indeed would make the MATS2 Rule even less cost-effective than it already is. Further errors in the EPA invocation of FPA Section 202(c) authority are addressed by counsel.

I declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the foregoing is true and correct.

DATED this 27th day of June, 2024.

By: s/ John D. Hines
John D. Hines