

**BEFORE THE  
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

In the Matter of ) DOCKET UE-170717  
)  
PACIFIC POWER & LIGHT )  
COMPANY, )  
)  
2016 Power Cost Adjustment Mechanism. )  
)  
\_\_\_\_\_ )

**RESPONSE TESTIMONY OF BRADLEY G. MULLINS  
ON BEHALF OF BOISE WHITE PAPER, L.L.C.**

**(REDACTED VERSION)**

**January 25, 2018**

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1 **I. INTRODUCTION AND SUMMARY**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Bradley G. Mullins, and my business address is 333 SW Taylor Street, Suite  
4 400, Portland, Oregon 97204.

5 **Q. PLEASE STATE YOUR OCCUPATION AND ON WHOSE BEHALF YOU ARE**  
6 **TESTIFYING.**

7 A. I am an independent consultant representing large energy consumers in jurisdictions around  
8 the United States. I am appearing on behalf of the Boise White Paper, L.L.C (“Boise”),  
9 which receives electrical services from PacifiCorp d/b/a Pacific Power and Light  
10 (“PacifiCorp” or the “Company”) in Washington state.

11 **Q. PLEASE SUMMARIZE YOUR EDUCATION AND WORK EXPERIENCE.**

12 A. I received Bachelor of Science degrees in Finance and Accounting from the University of  
13 Utah. I also received a Master of Science degree in Accounting from the University of  
14 Utah. After receiving my Master of Science degree, I worked at Deloitte Tax, LLP, where  
15 I was a Tax Senior performing research and development tax credit studies. Subsequently,  
16 I worked at PacifiCorp as an analyst involved in regulatory matters, primarily related to  
17 power supply costs. I began performing independent consulting services in 2013 and have  
18 since been involved in regulatory matters on behalf of utility customers located in  
19 jurisdictions throughout the United States, including before the Washington Utilities and  
20 Transportation Commission (“Commission”). My list of regulatory appearances may be  
21 found in Exhibit BGM-2.

1 **Q. WHAT IS THE PURPOSE OF YOUR RESPONSE TESTIMONY?**

2 A. On October 2, 2017, both the Commission Staff and Boise submitted letters to the  
3 Commission requesting that this matter, the 2016 Power Cost Adjustment Mechanism  
4 (“PCAM”) of PacifiCorp, be heard in an adjudicative proceeding. The primary issue of  
5 concern cited in the respective letters was whether certain costs related to the failure and  
6 abandonment of the Joy Longwall Mining System were appropriately reflected in the  
7 PCAM deferral balance over the period January 1, 2016 through December 31, 2016 (the  
8 “Deferral Period”). PacifiCorp has proposed to include those costs as a component of the  
9 delivered cost of fuel from its Bridger Coal Company (“BCC”) affiliate to the Jim Bridger  
10 power plant. On October 26, 2017, Administrative Law Judge Gregory J. Kopta approved  
11 the requests of Staff and Boise to consider this issue in an adjudicative proceeding. The  
12 purpose of my Response Testimony is to evaluate the costs related to failure and  
13 abandonment of the Joy Longwall in the Deferral Period.

14 **Q. PLEASE SUMMARIZE YOUR PRIMARY CONCLUSIONS AND**  
15 **RECOMMENDATION?**

16 A. On a total-company basis, PacifiCorp has included approximately \$43,360,167 of direct  
17 and indirect costs related to the Joy Longwall failure and abandonment in the actual Net  
18 Power Costs (“NPC”) in the Deferral Period. These costs are somewhat unusual since the  
19 Joy Longwall has never been considered by the Commission to be used and useful utility  
20 plant necessary to provide services to Washington customers. The equipment failed  
21 catastrophically only a few months after being placed into service and was not included in  
22 rate base in PacifiCorp’s most recent rate proceeding, Docket UE-152253.<sup>1/</sup> Based on the

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<sup>1/</sup> Exh. BGM-4 at 15 (PacifiCorp’s Jan. 4, 2018 Resp. to Boise DR 002).

1 information I have reviewed, not only is it improper for PacifiCorp to seek recovery of  
2 abandonment and failure costs for plant which the Commission has never approved in rates,  
3 the costs resulted from a pattern of inadequate management and mining controls at the BCC  
4 mine. I recommend the Commission require PacifiCorp to remove all costs associated with  
5 the failure and abandonment in the Joy Longwall from the PCAM deferral balance  
6 calculation.

## 7 **II. THE JOY LONGWALL**

### 8 **Q. DID PACIFICORP OVER-COLLECT ACTUAL NPC IN THE DEFERRAL** 9 **PERIOD?**

10 A. Yes. As identified in Exhibit MGW-2 at Page 2, Line 11, PacifiCorp's PCAM claims over-  
11 collected NPC in the deferral period by approximately \$5,605,682, representing  
12 approximately 1.6% of total revenues. This over-collection exceeded the \$4,000,000  
13 deadband in the PCAM by approximately \$1,605,682, an amount which was further  
14 subjected to 75/25 percent sharing between customers and PacifiCorp. After applying the  
15 sharing bands, PacifiCorp proposes to credit customers only \$1,204,262. In total,  
16 PacifiCorp's calculation results in PacifiCorp retaining \$4,401,421 of over-collected NPC,  
17 in addition to recovering the full cost associated with the Joy Longwall failure in current  
18 base rates. Thus, removing the Joy Longwall costs means that PacifiCorp over-collected  
19 by an even greater amount than represented in its filing.

### 20 **Q. HOW DOES THE REMOVAL OF THE JOY LONGWALL COSTS IMPACT THE** 21 **PCAM DEFERRAL BALANCE?**

22 A. Page 1 of Exhibit BGM-3C details the PCAM balance calculation with the direct and  
23 indirect Joy Longwall costs removed. As can be identified from that exhibit, Washington-  
24 allocated NPC declines by \$9,790,835 as a result of removing the Joy Longwall costs.

1 Before application of the deadband and sharing elements, PacifiCorp actually over-  
2 collected NPC by approximately \$15,396,517 in the Deferral Period with the Joy Longwall  
3 costs removed. Of that over-collected amount, approximately \$6,189,652 is retained by  
4 PacifiCorp and \$9,299,497 is credited to customers after considering the application of the  
5 deadband, sharing mechanisms, and interest. Thus, even if the Commission requires  
6 PacifiCorp to exclude the extraordinary costs of the Joy Longwall Costs, PacifiCorp will  
7 still be allowed to recover \$6,189,652 or 63.2% of the extraordinary Joy Longwall costs as  
8 a result of applying the deadband and sharing bands.

9 **Q. PLEASE PROVIDE SOME BACKGROUND ON THE JOY LONGWALL.**

10 A. The Joy Longwall system was transferred from PacifiCorp's Deer Creek mine near  
11 Huntington, Utah to the Bridger Underground mine, where it began operation on  
12 September 1, 2015.<sup>2/</sup> The reason for transferring the Joy Longwall to the Bridger  
13 Underground mine was to gain access to areas in the mine where the coal seam was too  
14 narrow to be effectively mined with its existing DBT longwall system, manufactured by  
15 Caterpillar.<sup>3/</sup> The Joy Longwall was initially installed in the 14<sup>th</sup> Right longwall panel,  
16 and made only modest advancement before losing advancement capabilities, which  
17 occurred four months after beginning operations in the Bridger Underground mine.<sup>4/</sup>  
18 PacifiCorp's strategy of using the Joy Longwall to access areas of the Bridger Underground  
19 mine with low coal seam height ultimately failed, as the coal seam proved to be too narrow,  
20 and too complex, to be mined effectively with the Joy Longwall.

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<sup>2/</sup> Exh. BGM-4 at 8 (PacifiCorp's Sep. 27, 2018 Resp. to Boise DR 004 (j)).

<sup>3/</sup> See Exh. BGM-5C (Joy Longwall Justification Memo).

<sup>4/</sup> See Exh. BGM-6C (Internal Joy Longwall Root Cause Analysis).

1 **Q. PLEASE SUMMARIZE WHY YOU RECOMMEND THE COSTS RELATED TO**  
2 **THE JOY LONGWALL BE EXCLUDED FROM THE PCAM BALANCE?**

3 A. PacifiCorp was fully aware of the risks associated with mining into the soft claystone  
4 material beneath the floor of the coal seam.<sup>5/</sup> Notwithstanding, when confronted with the  
5 narrowing coal seam, [REDACTED]

6 [REDACTED]”<sup>6/</sup>

7 This action exposed the soft claystone and ultimately led to the immobilization of the  
8 shearer. It also led to a failed recovery effort that lasted approximately 10 months.<sup>7/</sup> Based  
9 on the evidence discussed below and presented as exhibits to my Response Testimony,  
10 however, I disagree that those extraordinary losses are appropriately included in the PCAM  
11 deferral balance for the Deferral Period.

12 **a. Cost of the Joy Longwall Failure**

13 **Q. WHAT WAS THE IMPACT OF THE ABANDONMENT AND FAILURE OF THE**  
14 **JOY LONGWALL ON NPC IN THE DEFERRAL PERIOD?**

15 A. PacifiCorp included the extraordinary losses that it incurred with respect to the Joy  
16 Longwall in the PCAM deferral balance as a component of the cost of fuel consumed at  
17 the Jim Bridger power plant. The extraordinary losses amount to approximately  
18 \$43,360,167 on a total-company basis, with approximately \$9,790,835 allocable to  
19 Washington results. The Washington-allocated amount represents approximately 2.8% of  
20 PacifiCorp’s annual revenues in Washington,<sup>8/</sup> and thus, is material.

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<sup>5/</sup> See Exh. BGM-7C at 5 (Geologic Report of 14th Longwall Panel).

<sup>6/</sup> See Exh. BGM-8C at 2 (MHSA Field Investigation).

<sup>7/</sup> See Exh. BGM-9C (External Review of Recovery Efforts).

<sup>8/</sup> Based on a Washington revenue requirement of approximately \$350 million.

1 **Q. PLEASE IDENTIFY THE JOY LONGWALL COSTS PACIFICORP INCLUDED**  
2 **IN THE PCAM BALANCE.**

3 A. In Table 1, below, I detail the direct and indirect costs associated with the Joy Longwall  
4 failure in the Deferral Period.

**TABLE 1**  
Impact of Joy Longwall Failure in the Deferral Period

	<u>Total-Company</u>	<u>WA-Allocated</u>
Abandonment Losses	\$ 12,503,830	\$ 2,823,396
Failed Recovery Efforts	7,383,939	\$ 1,667,312
Depreciation Expense	17,742	\$ 4,006
Lost Production Impact		
On Actual Tons Delivered	<u>23,454,656</u>	<u>\$ 5,296,120</u>
<b>Total</b>	<b>\$ 43,360,167</b>	<b>\$ 9,790,835</b>

5 **Q. PLEASE PROVIDE AN OVERVIEW OF THE AMOUNTS DETAILED IN**  
6 **TABLE 1.**

7 A. There is no dispute regarding the amount of direct costs PacifiCorp included in the PCAM  
8 balance in connection with abandonment losses, recovery efforts, and depreciation  
9 expenses.<sup>9/</sup> Since there was no longwall system in place in the underground mine for the  
10 majority of 2016, however, the failure also had a material impact on the unit cost of coal  
11 consumed at the Jim Bridger power plant. This is due to the fact that, between January  
12 2016 and August 2016, PacifiCorp had no active longwall system in place. The DBT  
13 Longwall, which had been idled in another section of the mine beginning around the time  
14 of the transfer of the Joy Longwall, did not resume coal operations for approximately 8  
15 months after the failure of the Joy Longwall occurred. Coal production during this period  
16 was accomplished using the continuous miner, which is less efficient and more expensive

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<sup>9/</sup> Exh. BGM-4 at 7 (PacifiCorp's September 27, 2017 Resp. to Boise DR 004(c)). See also, Exh. MGW-1T at 12:13-18.



1 than the longwall mining system that had been in place in the underground mine. As the  
2 tons delivered by the mine declined due to a less efficient mining system, the cost of  
3 operating the mine was spread over fewer tons. Accordingly, such costs are relevant when  
4 determining the total cost associated with the failure of the Joy Longwall system.

5 Nevertheless, when requested to quantify the impact of lost mine production on  
6 coal delivered in the test period, PacifiCorp stated that it had never performed such an  
7 analysis, and was not willing to “speculate” about what the impacts might be.<sup>10/</sup> I view  
8 the calculation to be important and relatively straightforward, so it was not clear to me why  
9 PacifiCorp had not performed such an analysis and was unwilling to do so. Exhibit BGM-  
10 3 quantifies those costs through an analysis that compares the budgeted unit costs of coal  
11 from the Bridger Underground mine to the actual unit cost of coal from the Bridger  
12 Underground mine in the Deferral Period.<sup>11/</sup>

13 **Q. HOW MUCH COAL WAS DELIVERED FROM THE BRIDGER**  
14 **UNDERGROUND MINE IN THE DEFERRAL PERIOD?**

15 A. In response to Boise Data Request 002(b), PacifiCorp provided BCC operating results for  
16 the Deferral Period.<sup>12/</sup> The relevant portions of those results have been included beginning  
17 on page 3 of my workpapers provided in Exhibit BGM-3C. As can be noted from that  
18 exhibit, the Bridger Underground mine actually delivered [REDACTED] tons of coal to the Jim  
19 Bridger power plant in the Deferral Period.<sup>13/</sup>

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<sup>10/</sup> Id. at 9 (PacifiCorp’s September 27, 2017 Resp. to Boise DR 004(q)).

<sup>11/</sup> Exh. BGM-3C at 2.

<sup>12/</sup> Exh. BGM-4 at 2 (PacifiCorp’s September 27, 2017 Resp. to Boise DR 002(b)).

<sup>13/</sup> Exh. BGM-3C at 5.

1 **Q. HOW MUCH COAL WAS EXPECTED TO BE DELIVERED FROM THE**  
2 **BRIDGER UNDERGROUND MINE IN THE DEFERRAL PERIOD?**

3 A. In response to Boise Data Request 002(a), PacifiCorp also provided operating budgets for  
4 the BCC mine for the period encompassing the deferral period, including the 2016  
5 operating budget for the Bridger Coal Company.<sup>14/</sup> That budget was prepared in July 2015,  
6 around the time that PacifiCorp made the decision to transfer the Joy Longwall to the  
7 Bridger Underground mine and has been included beginning on page 6 of my workpapers  
8 in Exhibit BGM-3C. As can be noted from that exhibit, PacifiCorp had budgeted to  
9 delivery of [REDACTED] tons of coal from the Bridger Underground Mine in the Deferral  
10 Period.<sup>15/</sup> Thus, actual production at the mine was only [REDACTED] % of the level PacifiCorp had  
11 forecast a few months prior to the Deferral Period.

12 **Q. WHAT WAS THE IMPACT OF THAT LOST PRODUCTION ON THE COST OF**  
13 **COAL?**

14 A. The impact of lost production on the cost of coal from the Bridger Underground mine was  
15 material. In actual operations, the total cost of the Bridger Underground mine was  
16 approximately \$ [REDACTED],<sup>16/</sup> excluding any of the direct cost impacts of the Joy  
17 Longwall. In Wyoming Docket 20000-514-EA-17, PacifiCorp confirmed in discovery that  
18 the abandonment losses of \$12,503,830 were never actually recorded in results of BCC.<sup>17/</sup>  
19 That non-confidential response, as well as several others from the Wyoming matter, have  
20 been included in Exhibit BGM-4.

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<sup>14/</sup> Exh. BGM-4 at 2 (PacifiCorp's September 27, 2017 Resp. to Boise DR 002(a)).

<sup>15/</sup> Exh. BGM-3C at 8.

<sup>16/</sup> Id. at 5 (When arriving at this amount, an extra line was added to PacifiCorp's workpapers to remove the direct removal and depreciation costs associated with the Joy Longwall failure).

<sup>17/</sup> Exh. BGM-4 at 19.

1 In contrast, PacifiCorp's budget forecast total cost of the Bridger Underground  
2 mine in 2016 was \$ [REDACTED].<sup>18/</sup> Thus, mine production had declined by [REDACTED]%, whereas  
3 total costs declined by only [REDACTED]%, after removing the direct costs associated with the Joy  
4 Longwall failure, resulting in significant increases to the cost of electricity produced at the  
5 Jim Bridger Power Plant in the deferral period.

6 **Q. BASED UPON YOUR ANALYSIS, WHAT WAS THE COST IMPACT OF THIS**  
7 **REDUCED PRODUCTION IN THE DEFERRAL PERIOD?**

8 A. On Page 2 of Exhibit BGM-3C, I detail the cost per ton of coal in PacifiCorp's budget,  
9 compared to the cost per ton of coal produced in actual operations.<sup>19/</sup> As can be noted from  
10 the exhibit, the cost per ton of coal delivered to the Jim Bridger power plant, excluding any  
11 direct costs associated with the Joy Longwall recovery effort, increased from \$ [REDACTED]/ton  
12 to \$ [REDACTED]/ton. The budgeted \$ [REDACTED]/ton is hardly a favorable number when one considers  
13 that the market cost of coal is closer to \$12.00/ton. Notwithstanding, the delivered cost of  
14 coal had increased by [REDACTED]%.

15 Accordingly, had the coal delivered to the Jim Bridger power plant corresponded  
16 to the budgeted level of underground mine output, cost of power at the Jim Bridger power  
17 plant would have been \$35,181,984 lower than experienced in the Deferral Period on a  
18 total plant-basis, with approximately \$23,454,656 attributable to PacifiCorp on a total-  
19 company basis. I have used this value as my adjustment related to the indirect costs of the  
20 Joy Longwall failure, as discussed above. This value can be obtained by multiplying the  
21 actual delivered tons ([REDACTED]) by the difference between the actual cost per ton (\$ [REDACTED])

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<sup>18/</sup> Exh. BGM-3C at 8.

<sup>19/</sup> Id. at 2.

1 and the budgeted cost per ton (\$ [REDACTED]). This amount is then further reduced to account for  
2 PacifiCorp's 2/3rds share ownership of the BCC mine.

3 **b. Problems at the Bridger Coal Company Mine**

4 **Q. PLEASE PROVIDE BACKGROUND ON THE BRIDGER COAL COMPANY**  
5 **MINE.**

6 A. The BCC mine, located in Sweetwater County, Wyoming, is the primary source of fuel for  
7 the Jim Bridger power plant. The other source of fuel for the Jim Bridger power plant is  
8 the Black Butte mine, located in the same vicinity.

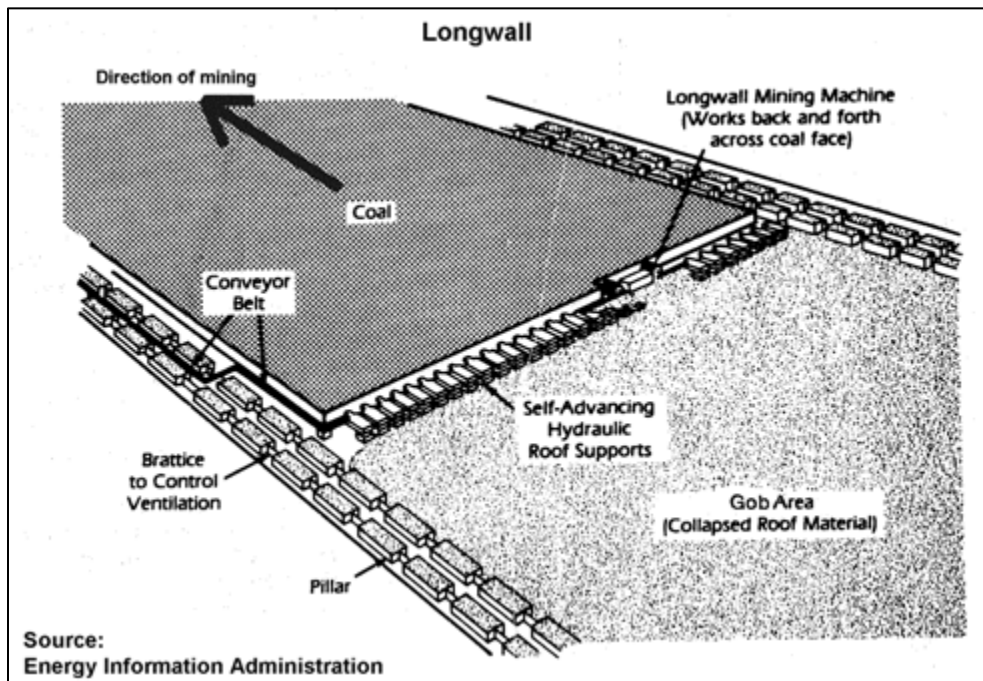
9 The BCC mine consists of sub-bituminous coal deposits in two, somewhat  
10 independent mining operations: the Bridger Surface mine and the Bridger Underground  
11 mine. The Bridger Surface mine has been in operation since approximately 1974, when  
12 the Jim Bridger power plant began operations. The Bridger Underground mine was  
13 developed more recently and began operations around 2004. The Bridger Underground  
14 mine originally was developed using a continuous mining technique, but in 2007,  
15 PacifiCorp invested and began operating the mine using a longwall mining system.

16 **Q. WHAT IS LONGWALL MINING?**

17 A. Longwall mining is a method of underground mining where rectangular areas, or "panels,"  
18 of underground coal are mined in a systematic process, involving the use of mechanized  
19 roof supports known as "shields." The longwall shields are installed end-to-end and  
20 advance into the coal panel as coal is mined using a piece of mining equipment called a  
21 "shearer." The shearer travels on a monorail system that is housed beneath the mechanized  
22 longwall shields, alongside a conveyor system. As the shearer travels along the monorail  
23 system, coal is cut from the face of the coal seam and transferred out of the mining area

1 using the conveyor. Once an area of the coal face has been mined with the shearer, the  
2 longwall shields, monorail, and conveyors advance forward to continue mining in the  
3 direction parallel to the long end of the rectangular longwall panel. As the longwall shields  
4 advance forward, the roof area behind the shields is allowed to cave-in, creating an unstable  
5 rocky area referred to as “gob.” Figures 1 and 2, below, provide visual illustrations of this  
6 process:

**FIGURE 1**  
EIA Illustration of Longwall Mining



**FIGURE 2**  
Image of Underground Mining Operations



1           Several references exist, which provide detailed overviews of the longwall mining  
2 process. One such document can be found in Exhibit BGM-10, a Department of Energy  
3 report published in 1995 that provides a relatively comprehensive overview of the longwall  
4 mining technique and its application in the United States. As of the time of writing this  
5 testimony, Caterpillar published a video online, providing a basic illustration of the  
6 longwall mining process:

7 [http://www.cat.com/en\\_US/articles/solutions/mining/longwall-principals-video.html](http://www.cat.com/en_US/articles/solutions/mining/longwall-principals-video.html).

8 **Q. WHAT IS A COAL SEAM?**

9 A. The nature of a coal seam is of particular importance to the issues related to the failure of  
10 the Joy Longwall. The coal seam is the layer of underground coal that is mined in an  
11 underground coal mine. A coal seam can possess varying degrees of thickness, although

1 “thin seam longwalls tend to be less productive than thicker seam operations.”<sup>20/</sup> The top  
2 of the seam is referred to as the roof, and the bottom of the seam is referred to as the floor.<sup>21/</sup>  
3 It is notable that “[t]he mine floor must provide a firm base for the movable roof supports  
4 used in longwall mining.”<sup>22/</sup> In addition, in the process of underground longwall mining,  
5 care must be taken to avoid mining out of the coal seam, and cutting into the roof or floor  
6 of the coal seam. Doing so materially reduces the quality of coal mined, increasing ash  
7 content and reducing the heat (MMBtu) content of coal delivered to, and consumed at, the  
8 generating facility. Mining out-of-seam can also result in additional wear and tear on, and  
9 possibly damage to, mining equipment. Finally, as PacifiCorp experienced with the Joy  
10 Longwall, mining into the floor of the coal seam can produce geological and safety  
11 concerns, resulting in destabilization of the longwall shields. The many problems  
12 encountered with respect to longwall mining out-of-seam are probably one of the factors  
13 that has contributed to “the clear trend away from thinner seam longwall mining.”<sup>23/</sup>

14 **Q. IS THE BCC A COMPETITIVE MINE?**

15 A. Far from it. The BCC mine is unequivocally the most expensive source of coal in  
16 Wyoming. Figure 3 below, demonstrates the weighted average delivered cost of coal from  
17 each of the coal mines located in Wyoming:

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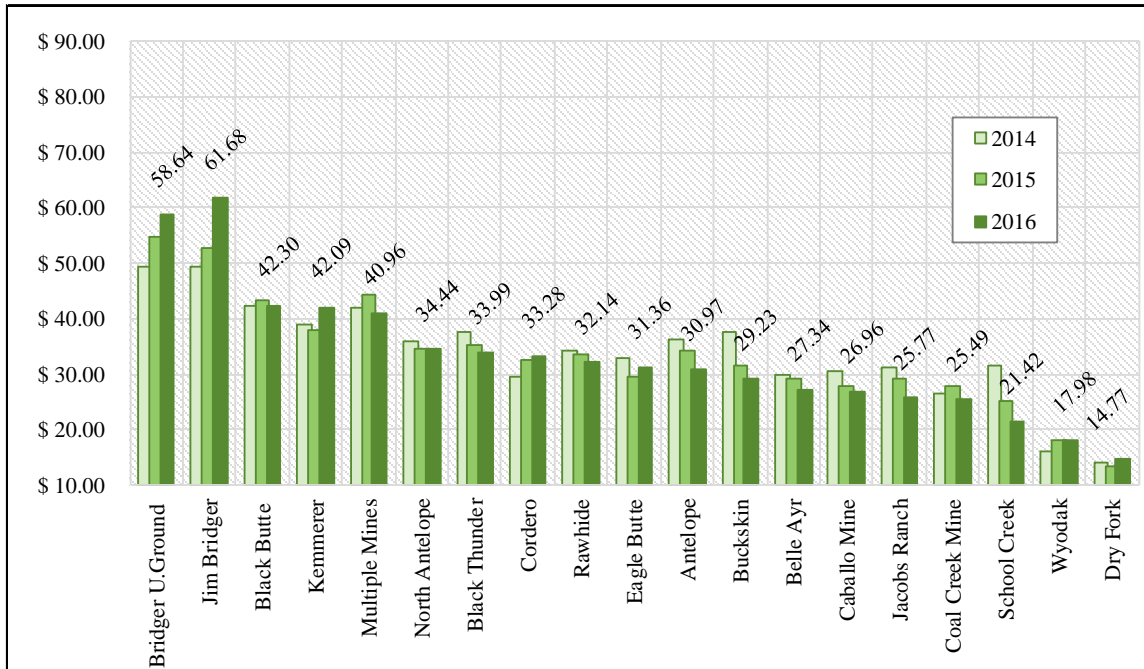
<sup>20/</sup> Exh. BGM-10 at 7.

<sup>21/</sup> Exh. BGM-7C provides an overview of these characteristics in the area of the mine where the Joy Longwall lost advancement capability.

<sup>22/</sup> Exh. BGM-10 at 5.

<sup>23/</sup> Exh. BGM-10 at 7.

**FIGURE 3**  
Weighted Average Delivered Coal Cost (\$/ton) by Wyoming Coal Mine  
BCC Coal Cost Excludes Longwall Abandonment Charge



1 **Q. PLEASE DESCRIBE THE DATA USED TO DEVELOP FIGURE BGM-3.**

2 A. Figure 3 is based on public data from Energy Information Administration (“EIA”) Form  
3 923, a filing that large power producers must make to provide information on their fuel  
4 supply, including pricing terms and volumes for coal contracts. The EIA cost data used to  
5 develop the above figure includes all of the rail transportation costs necessary to deliver  
6 coal from the mine to the power plant where the coal is ultimately consumed. The Joy  
7 Longwall abandonment charge of approximately \$18,755,745 (\$12,503,830 of which is  
8 attributable to PacifiCorp) was not included in the costs reported to the EIA for 2016. For  
9 that and other accounting reasons the \$/ton cost of coal from the Bridger Underground  
10 mine reported to the EIA is different than the \$/ton cost of coal reported in PacifiCorp’s



1 results that I used to calculate the lost cost of production associated with the longwall  
2 failure above.

3 **Q. WHAT CONCLUSION DO YOU DRAW FROM FIGURE 3?**

4 A. The coal prices in Figure 3 represent the “delivered cost” and include rail transportation  
5 costs to areas as distant as the Charles P. Crane Generating Station in Bowleys Quarters,  
6 Maryland. The coal from BCC, on the other hand, requires no transportation costs to  
7 deliver coal to the Jim Bridger power plant. Thus, BCC coal is the most expensive coal  
8 currently being produced in Wyoming because its cost exceeds the average cost of coal  
9 from every other coal mine located in Wyoming, including the cost of transportation.

10 **Q. HOW DOES COAL FROM BCC COMPARE TO THE MARKET PRICE FOR**  
11 **COAL?**

12 A. With market prices for coal in 2017 from the Powder River Basin hovering around  
13 \$12.00/Ton,<sup>24/</sup> costs of around \$60.71/ton (before considering the abandonment charge)  
14 for coal is extraordinarily problematic for ratepayers, particularly when one considers that  
15 PacifiCorp has resorted to mining risky areas of its mining reserves.

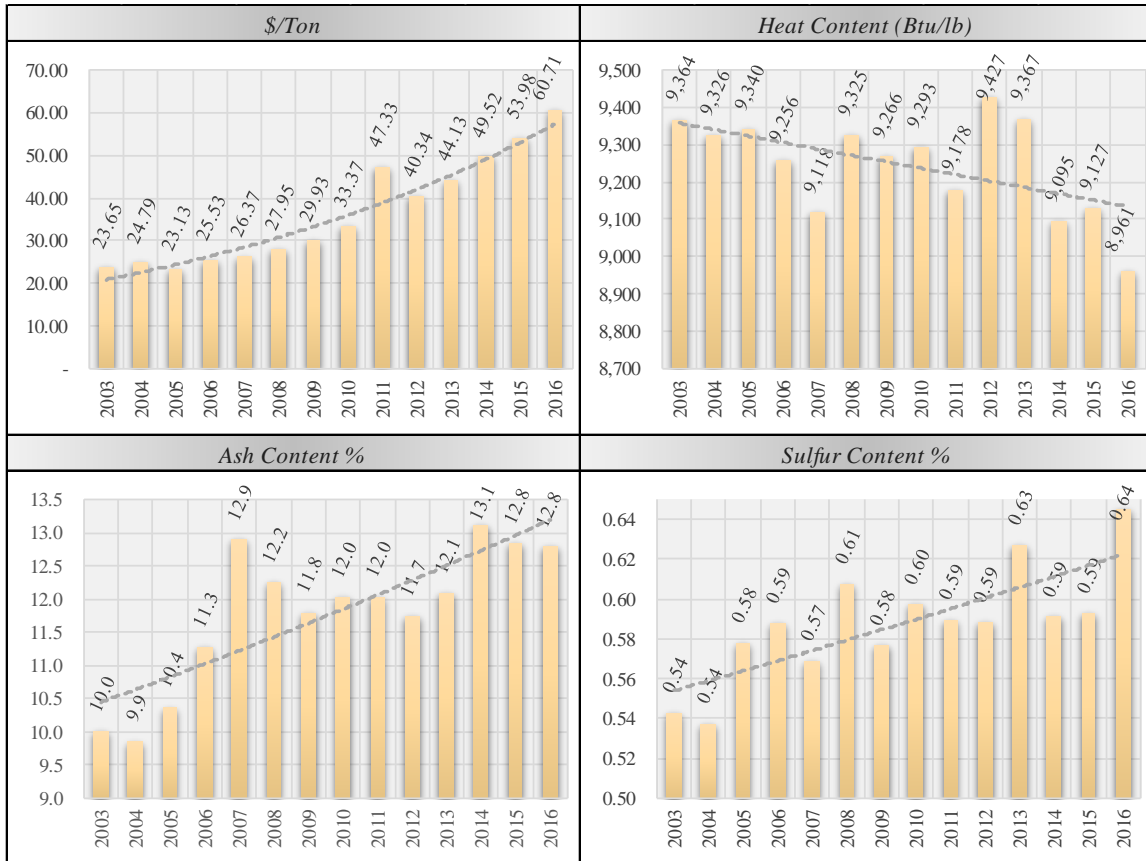
16 **Q. HAVE THERE BEEN OTHER PROBLEMS AT BCC BESIDES COSTS?**

17 A. Yes. In recent years the quality of coal produced at BCC has also been problematic. In  
18 fact, the poor coal quality at the underground mine was one of the factors PacifiCorp cited  
19 to justify the transfer of the Joy Longwall from the Deer Creek mine. Specifically, the  
20 mine has suffered from issues related to high ash content, which can be noted in Figure 4,  
21 below.

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<sup>24/</sup> See, e.g., <https://www.eia.gov/coal/markets/> (accessed Jan. 23, 2018).

**FIGURE 4**  
**Historical Attributes of Coal from Bridger Coal Company**  
**Source: EIA Form 923**



1 **Q. PLEASE EXPLAIN FIGURE 4.**

2 A. Figure 4 details certain attributes of the coal from BCC over the period 2003 through  
 3 2016.<sup>25/</sup> On every measurement, the BCC mine has been trending unfavorably. Costs are  
 4 up. Heat content is down, dropping to 8,960 btu/lb in the test period.<sup>26/</sup> Ash content is up.  
 5 Sulfur content also increased over the period. This is viewed over a period when coal

<sup>25/</sup> Note there are slight differences between the cost per ton reported in EIA Form 923 and the amounts described in testimony above, presumably due to the way that information gets reported to the EIA. I did not attempt to reconcile the two cost calculations as a part of preparing this testimony.

<sup>26/</sup> Of note, the declining heat content is likely another indirect cost associated with the Joy Longwall failure, which has not been reflected in the indirect costs I have calculated as a part of this testimony

1 mines have been struggling to compete, and many have been forced to cease operations.  
2 Notwithstanding, there appears to have been no improvement, and in fact, worsening  
3 conditions at BCC. This is evidence of inadequate management at the mine. Indeed, were  
4 BCC not supported by ratepayers, there is little doubt it would have closed by now as well.

5 **Q. HOW DOES HIGH ASH CONTENT IMPACT OPERATIONS AT A COAL**  
6 **PLANT?**

7 A. Ash content negatively impacts the operation of a coal plant in several ways. First, high  
8 ash coal can produce slag, a black glass-like substance that can cause problems by  
9 accumulating around the boiler. It can also cause other harmful coal combustion residuals,  
10 requiring expensive remediation efforts to correct. High ash coal also tends to have lower  
11 heat content, making it more expensive to burn. In addition, high ash coal can produce  
12 opacity problems, making it difficult for a plant to comply with haze requirements. All of  
13 these factors contribute to making high ash coal more expensive to consume at a coal plant  
14 relative to low ash coal, and many of those costs may not be known for many years until a  
15 site undergoes remediation efforts.

16 **Q. DID HIGH ASH COAL HAVE AN IMPACT ON THE OPERATIONS OF THE JIM**  
17 **BRIDGER POWER PLANT IN THE DEFERRAL PERIOD?**

18 A. Yes. My understanding is that the Jim Bridger Power Plant was derated for a major portion  
19 of the Deferral Period as a result of burning high ash coal.

20 **Q. WHEN DID LONGWALL MINING ORIGINALLY BEGIN AT THE BRIDGER**  
21 **UNDERGROUND MINE?**

22 A. Longwall operations began in 2007, when PacifiCorp invested in the DBT longwall system  
23 manufactured by Caterpillar.<sup>27/</sup> Following the transfer of the Joy Longwall—which

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<sup>27/</sup> Exh. BGM-4 at 10 (PacifiCorp's September 27, 2017 Resp. to Boise DR 004(s)).

1 derives its name from the manufacturer, Joy Global—the DBT longwall was idled  
2 beginning around July 27, 2015.<sup>28/</sup> Following the failure of the Joy Longwall in late  
3 December 2015, the DBT longwall did not return to service until August 2016.  
4 Accordingly, for an approximate 8-month period in 2016, PacifiCorp had no active  
5 longwall mining operation in the underground mine. This factor, along with the  
6 abandonment losses and costs associated with the failed recovery effort associated with the  
7 Joy Longwall compounded to make worse what was already a bad situation at BCC.

8 **Q. IS PACIFICORP MANAGING THE MINE IN THE BEST INTEREST OF**  
9 **RATEPAYERS?**

10 A. In my opinion no. Ratepayers have been concerned with the excessive costs and poor  
11 quality of coal from the BCC mine for many years, yet PacifiCorp has been reluctant to  
12 properly analyze the mine in conjunction with the Jim Bridger power plant in a way that  
13 makes sense for ratepayers. In Oregon, PacifiCorp expects to complete a long-term fuel  
14 plan, including an analysis of continued operation of the Bridger Underground mine, within  
15 the next few months.

16 **c. The Joy Longwall Transfer**

17 **Q. WHY DID PACIFICORP TRANSFER THE JOY LONGWALL SYSTEM TO THE**  
18 **BRIDGER UNDERGROUND MINE?**

19 A. Attached as Exhibit BGM-5C is the memorandum PacifiCorp relied upon to justify  
20 transferring the Joy Longwall to BCC. Several pertinent facts can be ascertained from that  
21 document. The first relates to the timing of the decision. That memorandum was issued  
22 on [REDACTED],<sup>29/</sup> although [REDACTED]

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<sup>28/</sup> Id. (PacifiCorp's September 27, 2017 Resp. to Boise DR 004(t)).

<sup>29/</sup> Exh. BGM-5C at 4.

1 [REDACTED]<sup>30/</sup> Having been  
2 involved in the proceedings in Oregon surrounding the closure of the Deer Creek mine that  
3 occurred in early 2015, this timing was surprising to me.<sup>31/</sup> In the Deer Creek proceeding  
4 PacifiCorp insisted that it planned to retire the Joy Longwall, which was assigned little to  
5 no salvage value. PacifiCorp made no mention of the alternative of transferring the Joy  
6 Longwall to the BCC mine in the Deer Creek proceeding, yet [REDACTED]  
7 [REDACTED] to when  
8 PacifiCorp filed its applications regarding the closure of the Deer Creek Mine in December  
9 2014. Based on this timing one would appropriately conclude that the omission of the  
10 potential transfer of the Joy Longwall in the Deer Creek Mine proceeding was due to the  
11 fact that, [REDACTED]  
12 [REDACTED], PacifiCorp did not yet believe the alternative of transferring the Joy  
13 Longwall to be viable at the time of its application, only to subsequently make a different  
14 decision on the matter.

15 **Q. DID PACIFICORP MAKE AN AFFILIATED INTEREST FILING IN**  
16 **WASHINGTON WHEN THE JOY LONGWALL WAS TRANSFERRED?**

17 A. Not that I am aware of.

18 **Q. DID PACIFICORP HAVE A FINANCIAL INCENTIVE TO TRANSFER THE JOY**  
19 **LONGWALL TO BCC?**

20 A. Yes. Because the Deer Creek mine was subject to regulatory accounting in jurisdictions  
21 other than Washington, transferring the equipment to BCC resulted in more favorable rate

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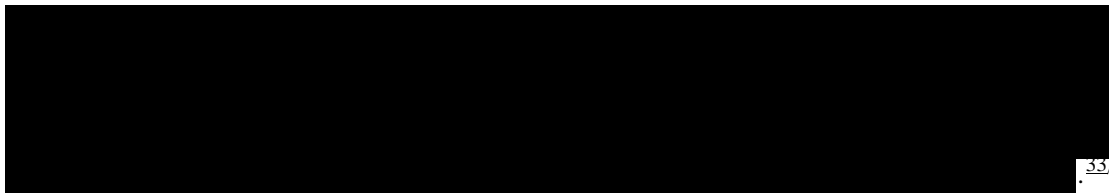
<sup>30/</sup> See Exh. BGM-11C.

<sup>31/</sup> See In re PacifiCorp, dba Pacific Power, Application for Approval of Deer Creek Mine Transaction, Or.PUC Docket No. UM 1712.

1 treatment to PacifiCorp. For this reason, PacifiCorp had a financial incentive to transfer  
2 the Joy Longwall, rather retiring the assets as it had originally planned. In addition, since  
3 Washington uses a different allocation system, PacifiCorp had the ability to recover  
4 approximately 115%<sup>32/</sup> of any costs incurred related to the Jim Bridger power plant,  
5 making it more attractive for PacifiCorp to invest in rate base through the Jim Bridger  
6 power plant than other coal facilities. Plus, PacifiCorp never actually removed the existing  
7 DBT longwall from rate base, providing it with the ability to earn a return on two longwalls  
8 within the BCC mine at the same time, even though it never used more than one at any  
9 given time.

10 **Q. WHAT WAS THE REASON FOR TRANSFERRING THE JOY LONGWALL TO**  
11 **THE BRIDGER UNDERGROUND MINE?**

12 A. The reason for transferring the Joy Longwall was to access areas of the mine with low coal  
13 seam height. PacifiCorp noted the following in the executive summary of Exhibit BGM-  
14 5C:

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<sup>32/</sup> Based on the “JAM” model in Docket No UE-152253 approximately 22.7% of the cost of Jim Bridger is allocated to Washington under the West Control Area method based on the “JBE” factor. Under the 2017 Protocol used by the other states, 92.3% of the cost of Jim Bridger was allocable to states other than Washington based on the “SE” factor. This means that PacifiCorp receives 115% cost recovery for the Jim Bridger Power Plant based on the difference between the two allocation approaches.

<sup>33/</sup> Exh. BGM-5C at 4.

1 **Q. HAD PACIFICORP COMPLETED ANY GEOLOGICAL ASSESSMENT OF**  
2 **USING THE JOY LONGWALL, PRIOR TO MAKING THE DECISION TO**  
3 **TRANSFER IT?**

4 A. No. PacifiCorp has not provided any evidence of having conducted any geological  
5 assessment associated with transferring the Joy Longwall prior to the time it made the  
6 decision to transfer the Joy Longwall to the Bridger Underground mine. The decision to  
7 transfer the Joy Longwall to the Bridger Underground mine was made through the  
8 justification memorandum dated [REDACTED] and provided in Exhibit BGM-5C. [REDACTED]

9 [REDACTED]

10 [REDACTED]

11 [REDACTED]

12 [REDACTED]

13 [REDACTED] <sup>34/</sup>

14 **Q. DID PACIFICORP EVENTUALLY PERFORM A GEOLOGICAL ASSESSMENT**  
15 **OF THE JOY LONGWALL TRANSFER?**

16 A. Yes. The geological assessment is attached as Exhibit BGM-7C. [REDACTED]

17 [REDACTED]

18 [REDACTED]

19 [REDACTED] <sup>35/</sup>

20 [REDACTED]

21 [REDACTED]

22 [REDACTED]

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<sup>34/</sup> Exh. BGM-5C at 1-3.

<sup>35/</sup> Exh. BGM-7C at 1.

1 [REDACTED]

2 [REDACTED]

3 [REDACTED]

4 **Q. DID THE GEOLOGICAL ASSESSMENT IDENTIFY THE RISK OF MINING**  
5 **INTO THE FLOOR THAT LED TO THE JOY LONGWALL FAILURE?**

6 **A.** [REDACTED]

7 [REDACTED] <sup>36/</sup> [REDACTED]

8 [REDACTED] <sup>37/</sup>

9 [REDACTED]

10 [REDACTED]

11 [REDACTED] <sup>38/</sup> [REDACTED]

12 [REDACTED]

13 [REDACTED] <sup>39/</sup> [REDACTED]

14 [REDACTED]

15 [REDACTED] <sup>40/</sup> [REDACTED]

16 [REDACTED] <sup>41/</sup>

17 [REDACTED]

18 [REDACTED]

19 [REDACTED] <sup>42/</sup> [REDACTED]

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<sup>36/</sup> Id. at 5.  
<sup>37/</sup> Id.  
<sup>38/</sup> Id.  
<sup>39/</sup> Id.  
<sup>40/</sup> Exh. BGM-8C at 2.  
<sup>41/</sup> Exh. BGM-7C at 5.  
<sup>42/</sup> Id. (Emphasis in original).



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[REDACTED]

**Q. DID PACIFICORP FOLLOW THAT GEOLOGICAL ADVICE IN THE PERIOD LEADING UP TO THE FAILURE?**

A. No. BGM-14C provides the actual geological observations of the coal face over the period September 2015 through January 2016. [REDACTED]

[REDACTED]

[REDACTED] For reference, the acronyms contained in the geological observations are defined as follows: CMS, carbonaceous mudstone; SS, sandstone; SSF, sandstone floor; CF, coal floor; C, coal; SLST, siltstone. Entries of SS, or SSF, mean that the longwall had mined through, or exposed, the floor of the coal seam. Entries of CMS mean that the claystone was exposed. Entries of Clayey SS mean that the transition area between the sandstone and claystone had been exposed.

<sup>43/</sup> Exh. BGM-14C at 56.

1 **Q. DID PACIFICORP EXPOSE THE SOFT CLAYSTONE IN ANY OF THESE**  
2 **INSTANCES WHERE THE FLOOR WAS MINED?**

3 A. Yes. Claystone was exposed on multiple instances in the period leading to failure. In  
4 response to WIEC Data Request 3.12 in Wyoming Docket 20000-514-EA-17, PacifiCorp  
5 confirmed that the claystone was exposed on December 15, 2015, and December 23,  
6 2015.<sup>44/</sup>

7 **Q. DID PACIFICORP UNDERTAKE CORRECTIVE OR PREVENTATIVE**  
8 **ACTIONS AFTER EXPOSING THE CLAYSTONE?**

9 A. PacifiCorp has provided no evidence that it undertook any corrective or preventative  
10 actions after exposing the soft claystone in these instances, despite the known risk  
11 associated with exposure. Exhibit BGM-12C provides the longwall shift reports over the  
12 period November 2015 through January 2016. In the December 15, 2015 and December  
13 23, 2015 longwall shift reports, [REDACTED]  
14 [REDACTED]  
15 [REDACTED].<sup>45/</sup> In fact,  
16 PacifiCorp's actions over this critical period have the appearance of being more detrimental  
17 than corrective or preventative. After exposing the claystone on December 23, 2015,  
18 PacifiCorp ceased performing geological observations of the coal face until after the  
19 longwall had been immobilized.

20 **Q. WAS THE CLAYSTONE EXPOSED AFTER DECEMBER 23, 2015?**

21 A. After December 23, 2015, the claystone was likely exposed continuously until the time that  
22 the shearer ultimately became immobilized, although there is no evidence to document the

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<sup>44/</sup> See Exh. BGM-4 at 25 (PacifiCorp's Resp. to WIEC DR 3.12).

<sup>45/</sup> Exh. BGM-12C at 47, 59.

1 composition of the coal face in that critical period since no geological observations were  
2 made.<sup>46/</sup>

3 **d. The Failure of the Joy Longwall**

4 **Q. PLEASE SUMMARIZE THE INCIDENT LEADING TO THE FAILURE OF THE**  
5 **JOY LONGWALL.**

6 A. Exhibit BGM-6C provides PacifiCorp's assessment of the failure of the Joy Longwall.

7 PacifiCorp describes the event as beginning on [REDACTED]  
8 [REDACTED]  
9 [REDACTED]  
10 [REDACTED]  
11 [REDACTED]  
12 [REDACTED]  
13 [REDACTED]  
14 [REDACTED]  
15 [REDACTED]  
16 [REDACTED]

17 **Q. WHEN DID PACIFICORP BEGIN MINING INTO THE FLOOR OF THE COAL**  
18 **SEAM?**

19 A. Diagram E of Exhibit BGM-6C details each instance where PacifiCorp geologists observed  
20 that the longwall system had mined into the floor of the coal seam.<sup>47/</sup>

21 [REDACTED]  
22 [REDACTED]

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<sup>46/</sup> See Exh. BGM-4 at 25 (PacifiCorp's Resp. to WIEC DR 3.12).

<sup>47/</sup> Exh. BGM-6C at 19.

1 [Redacted]  
2 [Redacted]  
3 [Redacted]  
4 [Redacted]  
5 [Redacted]  
6 [Redacted]  
7 [Redacted]  
8 [Redacted]  
9 [Redacted] <sup>48/</sup>  
10 [Redacted]  
11 [Redacted]  
12 [Redacted]  
13 [Redacted]  
14 [Redacted]  
15 [Redacted]  
16 [Redacted]  
17 [Redacted]  
18 [Redacted]  
19 [Redacted]  
20 [Redacted]  
21 [Redacted] <sup>49/</sup>

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<sup>48/</sup> See Exh. BGM-7C at 25.

<sup>49/</sup> See Exh. BGM-4 at 25 (PacifiCorp's Resp. to WIEC DR 3.12).

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**Q. WAS ANY GEOLOGICAL MONITORING UNDERTAKEN AFTER DECEMBER 17, 2015?**

A. No. PacifiCorp has reported that geological staff made no visits to the coal face over the critical period of December 17, 2015 through January 8, 2015.<sup>50/</sup> The geological conditions had been deteriorating in the period leading up to December 23, 2015, when PacifiCorp’s employees first began to suspect that there might be a problem with the Joy Longwall. Yet, when faced with these geological problems, no geological assessments of the coal face were made. In fact, the geological staff did not visit the coal face until January 8, 2016, [REDACTED]. It is possible that, as a result of the winter holidays, the geological staff were on vacation. But in any event, it is clear that PacifiCorp had been undertaking the risky geological activity of mining extensively into the sandstone floor of the coal seam for an extended period of time. It had also knowingly exposed the soft claystone on multiple occasions. Yet, after the incidents began to occur on December 23, 2015, no geologist visited the coal face for sixteen days.

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<sup>50/</sup> Exh. BGM-4 at 23 (Company’s Resp. to WIEC DR 3.5(a)).

1 **Q. WERE UNCONTROLLABLE GEOLOGICAL FEATURES THE CAUSE OF THE**  
2 **PROBLEMS?**

3 A. PacifiCorp characterizes the cause of this event as being the result of geological conditions  
4 that were outside of its control. It suggests the cause was related to “undulations, or  
5 structural rolls, in the floor [that] became more pronounced and frequent.”<sup>51/</sup> PacifiCorp,  
6 however, does not discuss the level of care that it exercised when confronted with these  
7 conditions. It may be true that the crew encountered difficult geological conditions, but  
8 these conditions were not unexpected. Challenging conditions are to be expected with any  
9 mining operations, and it is apparent from the maps accompanying the geological report  
10 that the coal seam [REDACTED]

11 [REDACTED]  
12 [REDACTED]<sup>52/</sup>

13 The longwall crew knew when the shearer was mining into the floor of the coal  
14 seam. The layers can be clearly noted through visual inspection of the coal face. Thus, the  
15 fact that no geological staff was involved in navigating this challenging geological area  
16 speaks to the lack of care PacifiCorp exercised when confronted with these risky  
17 conditions. This fact appears to be a key driver of the policy changes that PacifiCorp made  
18 subsequent to the longwall failure, which now require consultation with geological staff  
19 prior to mining areas of heightened geological concerns.<sup>53/</sup> It is apparent from the Joy  
20 Longwall failure, however, that these protocols should have been in place all along.

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<sup>51/</sup> Exh. MGW-1T at 14:18-20.  
<sup>52/</sup> Exh. BGM-7C at 28-29.  
<sup>53/</sup> See Exh. BGM-13C.

1 **Q. WERE THE CONDITIONS TOO CHALLENGING TO BE EFFECTIVELY**  
2 **MINED BY THE LONGWALL CREW?**

3 A. If one were to conclude that the geological conditions were too challenging to be mined  
4 effectively by the Joy Longwall, even with the support of geological staff, that speaks to  
5 the lack of care exercised by PacifiCorp when considering the geological suitability of the  
6 Joy Longwall in that area of the mine. As discussed, PacifiCorp had made no geological  
7 assessment prior to making the decision to transfer the Joy Longwall to the Bridger  
8 Underground mine.

9 **Q. HOW DO THE GEOLOGICAL CONTROLS AT BCC COMPARE TO THOSE AT**  
10 **OTHER MINES IN THE REGION?**

11 A. Prior to the incident with the Joy Longwall, PacifiCorp had virtually no geological controls  
12 in place associated with longwall operations. The geological controls identified in Exhibit  
13 BGM-13C were only implemented after the failure of the Joy Longwall. In Exhibit  
14 BGM-15, I provide a document that details some of the geological controls that have been  
15 implemented by Bowie Resources in its Paonia, Colorado mine. That document  
16 emphasizes how critical it was to Bowie Resources to have robust geological controls in  
17 place, particularly when encountering complex geological conditions. Simply put, it is not  
18 normal for an underground mine to lack specific geological controls, as was the case at the  
19 Bridger Underground Mine prior to the Joy Longwall failure.

20 **Q. HAS AN INDEPENDENT REVIEW OF THE FAILURE BEEN PERFORMED?**

21 A. No. PacifiCorp obtained an independent review of the recovery efforts, but no independent  
22 root cause analysis has been performed with respect to the events that led to the Joy  
23 Longwall failure. The independent review, which consists of only 3 pages, was conducted

1 by Golder Associates, an Australian based engineering firm, and has been provided as  
2 Exhibit BGM-9C.

3 **Q. HAS THE MINE HEALTH AND SAFETY ADMINISTRATION REVIEWED THE**  
4 **INCIDENT?**

5 A. On February 22, 2017, the Mine Health and Safety Administration (“MHSA”) issued an  
6 investigative report detailing its investigation of the mine ground conditions during the  
7 recovery effort. That report is attached as Exhibit BGM-8C and does not consider the root  
8 cause of the failed longwall. One important distinction that can be gained from this report  
9 is that, in PacifiCorp’s investigation provided in Exhibit BGM-6C, [REDACTED]

10 [REDACTED]

11 [REDACTED]<sup>54/</sup> In contrast, the MHSA Report indicates that [REDACTED]

12 [REDACTED]. When  
13 asked to confirm who made the decision to mine into the floor, PacifiCorp confirmed that  
14 it is ultimately the responsibility of the Longwall Shift Foreman and the Mine Manager to  
15 make such decisions, when confronted with areas of critical geological concern, such as  
16 those encountered in 14<sup>th</sup> Right longwall panel in early December 2015.<sup>55/</sup>

17 **e. Conclusion**

18 **Q. BASED ON THE FOREGOING, WHAT IS YOUR CONCLUSION?**

19 A. As a threshold matter, the Joy Longwall has never been found to be appropriately included  
20 in rates in Washington, and for that reason, it is wholly inappropriate for PacifiCorp to seek  
21 recovery of abandonment and failure costs through the PCAM deferral balance.

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<sup>54/</sup> Exh. BGM-6C.

<sup>55/</sup> Exh. BGM-4 at 12 (PacifiCorp’s September 27, 2017 Resp. to Boise DR 004(z)).



1           Notwithstanding, I believe the information identified in discovery demonstrates  
2           that PacifiCorp acted imprudently with respect to the Joy Longwall failure. When  
3           developing the strategy associated with transferring the Joy Longwall, PacifiCorp  
4           neglected to assess the risks associated with using the Joy Longwall to mine areas of the  
5           Bridger Underground mine with a complex, narrow coal seam. A geological analysis had  
6           not been completed at the time the decision was made to transfer the equipment. PacifiCorp  
7           was also aware of consequences that would result if it mined into the soft claystone area  
8           beneath the thin sandstone floor of the coal seam, yet the evidence shows that PacifiCorp  
9           had been mining into the floor almost continually beginning in early December 2015.  
10          When conditions worsened due to the narrowing coal seam, PacifiCorp has not identified  
11          a single precaution that was undertaken to avoid exposing the soft claystone. Confronted  
12          with these circumstances, PacifiCorp continued to mine more extensively into the floor of  
13          the coal seam, ultimately leading to the failure of the shields and immobilization of the  
14          shearer. PacifiCorp has provided no evidence that it undertook any proactive or  
15          preventative measures to avoid mining the floor of the coal seam.

16                Taking this evidence into consideration, I believe there is no basis to conclude that  
17          the costs associated with the abandonment and failure of the Joy Longwall are prudent.  
18          Accordingly, I recommend that the Commission require PacifiCorp to remove all direct  
19          and indirect costs associated with the failure and abandonment.

20   **Q.    DOES THIS CONCLUDE YOUR RESPONSE TESTIMONY?**

21   **A.    Yes.**