STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Case No. _____

Tariff filing of Green Mountain Power requesting an)
increase in its base rates starting January 1, 2019, to be)
fully offset by bill credits through September 30, 2019)

PREFILED TESTIMONY OF JOHN R. FISKE ON BEHALF OF GREEN MOUNTAIN POWER

April 13, 2018

Summary of Testimony

Mr. Fiske gives an overview of GMP's T&D planning principles, and supports capital additions to Distribution Substations, Lines and Equipment Purchases, and to Transmission Substations and Lines. Mr. Fiske explains how GMP is evolving its traditional T&D planning principles to leverage the benefits of storage and distributed resources on behalf of customers to assist in identifying least-cost opportunities to drive down costs of the regional bulk grid, and move to a home-, business-, and community-based energy system.

EXHIBIT LIST

Exhibit GMP-JRF-1 T&D Department Capital Planning Philosophy
Exhibit GMP-JRF-2 T&D Capital Additions (2018-2019)

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ON BEHALF OF GREEN MOUNTAIN POWER

I. INTRODUCTION

Q1. What is your name and business affiliation?

A1. My name is John Fiske, and I am employed by Green Mountain Power ("GMP") as Lead of Engineering.

Q2. Please describe your educational background and business experience.

A2. I earned a Bachelor of Science Degree in Electrical Engineering from the University of Vermont and am a Licensed Professional Engineer in the State of Vermont. Prior to my current position, I held the positions of Manager of Substation Design/Relay Protection, System Protection Engineer and Division Engineer at Central Vermont Public Service Corporation ("CVPS"). I also worked as a Manager of Engineering and System Protection Engineer at Vermont Electric Power Company in Rutland, Vermont.

Q3. Have you previously testified before the Vermont Public Utility Commission ("PUC")?

A3. Yes, most recently, I have testified in the following Dockets: 7857 (Randolph Substation), 7887 (Vernon Road Substation Breaker Addition), 8029 (St. Johnsbury Substation Upgrade), 8030 (Woodstock Substation Upgrade), 8205 (Georgia Interconnection Project), 8308 (Waterbury/Duxbury Substation), and the 2017 GMP rate case (Case No. 17-3112-INV).

Q4. What is the purpose of your testimony?

A4. The purpose of my testimony is to first provide a brief overview of how GMP is evolving its traditional transmission and distribution ("T&D") planning principles to leverage the benefits of storage and distributed resources on behalf of customers to assist in identifying least-cost opportunities to drive down costs. I also describe the development of GMP's T&D Capital Plan and support the T&D costs included in the cost of service. For purposes of my testimony, the interim period runs from October 1, 2017 to December 31, 2018 and the rate period runs from January 1, 2019 to September 30, 2019.

Q5. How much does GMP spend each year to maintain or improve the reliability and safety of the existing T&D system for customers?

A5. GMP expects to invest approximately $63,671,809 million in the interim period and $33,612,384 million in the rate period on behalf of customers to maintain or improve safety and reliability of the existing T&D system. GMP's outstanding performance providing reliable service to our customers, as measured by SAIFI and CAIDI, as well as GMP's Overall Customer Satisfaction Index, shows that the Company is doing a very good job identifying and prioritizing T&D project upgrades, including our blankets, with these investments. Customer satisfaction is described further in Mr. Costello's testimony.

Q6. How is GMP adapting to the rapidly evolving energy landscape while continuing to provide reliable power?

A6. As I described in my testimony for the 2018 rate case, GMP is evolving our traditional T&D planning principles. Instead of limiting our thinking to traditional infrastructure that continues our reliance on century-old infrastructure models, our team considers how to use emerging technologies such as storage and distributed resources to better provide reliable service at a lower cost. This is described further in the testimonies of Mr. Otley, Mr. Castonguay, and Mr. Shields. At a high level, it means that we now consider whether storage, distributed resources, or a combination of both can replace what would otherwise be a traditional infrastructure upgrade, saving customers money, increasing reliability and resiliency, and making our energy delivery system more home-, business-, and community-based.

This is part of our larger strategy to leverage storage for grid planning and harness multiple benefit streams for customers, including reduced power and transmission expenses, reduced transmission and distribution projects, reduced power supply risk, and enhanced resiliency. In doing so, we seek to deliver on a better energy future for customers that maintains reliability, but does so in a new way, by leveraging technology as we move to a home-, business-, and community-based system.

At the same time, and as I describe later in my testimony, we are upgrading and modernizing the existing T&D system to ensure we continue to deliver on our commitment to reliable, safe, efficient, and cost-effective service for our customers.

Q7. How are T&D projects helping prepare the grid for the emerging Distributed Energy Resources (DER) model of power delivery?

A7. Many of the proposed capital additions for the T&D system will allow for more capability to interconnect additional distributed energy resources without compromising system power quality or reliability. Good examples of this are the Barre North End Rebuild and Barre South End Rebuild Distribution Substation projects. The existing infrastructure had very limited capability for interconnection of DERs. The proposed rebuild projects, although primarily driven by reliability improvement and asset management, will also provide increased distributed generation interconnection capacity. The conversion of these substations from 4.16 kV to 12.47 kV, along with the addition of a larger substation transformer, provides improved system strength for all of the Barre-area distribution circuits. This increased system strength will reduce the potential for adverse impacts (i.e. voltage flicker) due to connected DER. A stronger T&D system also will allow for increased flexibility and opportunities for utilization of emerging technologies, which can improve the overall GMP system performance.

GMP is also planning to explore the potential to increase distributed generation ("DG") hosting capacity through battery storage systems for potential future implementation at substations nearing their DG hosting capacity limits. An example of this is the Panton Battery project, where GMP proposes limited testing of this capability to provide experience and learning about the requirements and potential tradeoffs related to increasing DG hosting capacity through battery storage systems. This same project will provide GMP with the opportunity to explore other potential grid-related benefits of

DER such as reactive power support, conservation voltage reduction (which may reduce the number of, or completely eliminate, line regulators required on the Panton circuit in the future) and distribution islanding. The battery storage also provides potential benefits of reducing the regional network service charge and of participating as a merchant plant in the forward capacity market, energy arbitrage and frequency regulation market.

II. DEVELOPMENT OF THE T&D CAPITAL PLAN

Q8. What are the criteria used to select projects to be included in the T&D Capital Plan?

A8. The main objectives of T&D capital expenditures are to assure the GMP T&D system can deliver power to our customers safely, efficiently, reliably, and cost-effectively. There are several categories of T&D projects, based on corresponding improvement criteria. These include:

1. Safety - Projects to replace obsolete or deteriorated plant that may not comply with current standards and codes, or that may have reduced functionality.
2. Service Reliability - Projects that will increase reliability by reducing the number of outages, the duration of outages, and/or the number of customers affected by outages.
3. Efficiency - Projects for the cost-effective reduction of system losses. These projects include capacitor placements, line reconductoring, load balancing, circuit reconfiguration, and voltage conversions.

4. Capacity Requirements - Projects to upgrade facilities in order to avoid thermal overload of equipment. These projects may be the result of load growth or to provide backup capability (improved reliability) for another substation, circuit, or feeder.

5. Customer Requested - Projects requested by a customer such as line extensions or line relocations. These customer requests include distributed generation projects that require capital upgrades of T&D infrastructure to enable the customer to interconnect with no adverse impacts.

6. Regulatory and Tariff Requirements - Projects required to achieve regulatory compliance or to meet a contractual/tariff obligation. This might include a project that is the subject of a stipulation between GMP and the Department of Public Service ("Department"), Agency of Natural Resources, or Agency of Transportation (state/municipal road jobs), and projects required by our joint-use and third-party attachment agreements.

Some T&D capital expenditures do not fall into a distinct category but could fall into multiple categories. See also **Exhibit GMP-JRF-1** which contains additional details about our approach to capital planning for T&D projects.

Q9. How are projects identified and selected to be included in the T&D Capital Plan?

A9. The T&D Capital Plan is developed through input from different areas of GMP by means of a comprehensive planning and budgeting process. Potential projects are identified by reviewing the multi-year capital plans that had been established, seeking input from

internal and external stakeholders and using the criteria described above. From this plan, a list of potential projects is identified. Information is then gathered to develop an initial scope, which describes the purpose of each project and its design requirements in more detail. From this information, a preliminary budget estimate is developed for each project and the Engineering, Operations, and Operation Technology Teams then review the projects to identify those with the highest priority. Prioritization of projects is based on a variety of factors including input from field personnel, specific operational needs, T&D efficiency and reliability analysis, customer requests, safety considerations, cost-to-benefit ratios, capacity constraints, regulatory and tariff obligations, as well as resource availability and timing issues. From this review, a list of projects is established as the preliminary T&D capital budget for the year. These projects are then vetted through GMP's Capital Management Team process to determine the final T&D capital budget. This overall Capital Management Team process is further described in witness Brian Otley's testimony.

Q10. How are the estimated costs and anticipated in-service dates of T&D projects developed?

A10. Once T&D projects to be included in the budget have been identified, more detailed cost estimates are developed. These cost estimates are developed from more detailed engineering designs and construction requirements that have been established for each project. Such estimates include stock material prices, internal labor cost estimates, and actual or previous similar quotes for direct materials and contractor services. In

developing the estimates, previous experience with other similar projects is also used. The final step involves developing a work plan and a schedule to complete each project. This work plan takes into consideration resource availability, material lead times, and permit requirements. From this work plan, in-service dates are established for each of the projects by adding a two-month buffer to the anticipated in-service date to allow for contingencies and final accounting.

Cost estimates for T&D blanket work orders ("WOs") are established by reviewing historical spending in each of the functional blanket work order categories. For rate-base purposes, the 5-year historical average based on actual spending adjusted for inflation is compared to the current-year budgets. The lesser of the two amounts are reflected in the rate base. Projects in the blanket work order categories have variable in-service dates and are typically closed monthly or quarterly.

Q11. What efforts does GMP take to ensure that the transmission and distribution projects contained in the Capital Plan will be implemented consistent with the schedule and budgeted costs?

A11. As part of the budget process, GMP develops a work plan and a schedule to complete each project. Weekly Engineering and Operations meetings occur to review project status. This includes a review of the assumptions regarding resource availability, material lead times, and permit requirements that went into the development of the in-service dates. If things have changed, strategies will be discussed to keep projects on track. Examples of such strategies could be the decision to hire contractors to complete

work if internal resources are not available, seeking out alternative vendors should one fail to provide adequate material lead time to maintain a critical path, or adding additional dollars for screening or acquisition of a new site in the event of an unforeseen contingency. The scale of each project dictates the level of project management necessary to assure strong project controls around schedule, budget, compliance, and safety.

The major active capital projects are reviewed monthly as part of our overall capital management process. This includes a review of the status of individual project budgets and schedules across the Company. In the event that an unforeseen issue develops, discussions will occur to determine impacts to current projects. This would happen in the event of a large equipment failure, for example, resulting in the identification of a problem that needs addressing immediately to continue safe and reliable operations for customers. This could result in a shuffling of priorities and projects dependent on resource requirements and availability.

Q12. Please describe how T&D capital expenditures advance the goals of GMP and its customers.

A12. Maintaining or improving safety and reliability of the system are the driving forces behind most T&D upgrades. T&D capital expenditures are an integral part of utility operations and directly impact our reliability, safety, and customer satisfaction. We continuously strive to improve system performance at reasonable costs. Reliability and safety improvement can be achieved in many different ways, including replacing assets

that are at the end of their service lives or are obsolete and can no longer be maintained or repaired, relocating lines from cross-country locations to the road, installing new technologies to improve system operability and reliability, or increasing capacity of the system to improve load serving and/or provide feeder backup capability if there is an outage.

III. T&D PROJECTS

Q13. Please summarize the categories of T&D projects included in the interim period and rate period cost of service.

A13. The capital expenditure categories included in the T&D Capital Plan for the interim and rate periods include Distribution Equipment Purchases, Distribution Lines, Distribution Substations, Transmission Lines, and Transmission Substations. The Distribution Equipment Purchases category is for equipment purchases of transformers, meters, and regulators and capacitors. Per the Memorandum of Understanding ("MOU") with the Department in last year's rate case, any single planned capital project within the blanket work order that exceeds $250,000 now has project-specific documentation. This will improve visibility regarding the type of projects being completed within the blankets. For this reason, the Distribution Line category now contains individual projects with expenditures estimated greater than $250,000 as well as a blanket for projects $250,000 or less. There are also blankets within the Distribution Substations and Transmission Lines and Substations categories to cover unforeseen failures in those areas. I address each of the blankets in a separate category below.

Q14. Please summarize the T&D plant additions by category for the interim period and rate period.

A14. The table below summarizes the projected costs for T&D capital projects for both the interim period and the rate period:

Category	Interim Period (10/1/2017-12/31/2018) ($000)	Rate Period (1/1/2019-9/30/2019) ($000)	Total ($000)
Distribution Substations	$8,471	$5,753	$14,224
Transmission Lines	$8,009	$3,228	$11,327
Transmission Substations	$5,566	$348	$5,915
Distribution Equipment Purchases (blanket)	$6,977	$4,115	$11,092
Distribution Lines	$34,558	$20,168	$54,726
Totals	$63,672	$33,612	$97,284

More detailed information concerning projects in each of these T&D categories, including a project description, plant addition amounts, in-service dates, and project criteria is contained in **Exhibit GMP-JRF-2** and further summarized below.

Q15. Please describe any significant differences in the methodology used to determine T&D project costs in this rate filing as compared to the previous rate case.

A15. In last year's rate filing, we employed a methodology to exclude growth from all individual projects and the blankets for the interim and rate periods because we based our rate period costs off of the actual costs in a test period which, of course, did not include

revenue associated with growth from new customers. This year, we are basing our rate period revenue off a forecast for anticipated load, which includes new revenue associated with new customers (growth). For this reason, I have not excluded growth from our T&D projects for the interim or rate periods. Please see the testimony of Mr. Ryan regarding the use of a forecast and inclusion of growth in our rate-period costs.

Q16. Please describe the type of projects included in the Distribution Substation category.

A16. The primary type of projects included in GMP's Distribution Substation capital expenditures for the interim and rate period are reliability and safety projects, which focus on replacing substation equipment that has reached the end of its service life or become obsolete. Many of our substation transformers, breakers, reclosers, and protection systems are 30 years old or older. The probability of failure starts increasing after 30 years of service and continues to increase as the age profile for equipment increases. Although proper maintenance and diagnostic testing can extend the life of substation transformers and other equipment, eventually it must be replaced because of failure risk, obsolescence, or the unavailability of spare parts. We anticipate spending an estimated $8,470,985 million in the interim rate period and an estimated $5,753,109 million in the rate period.

Q17. Can you please describe some of the types of Distribution Substation projects included this filing?

A17. Yes. In a number of projects, GMP is conducting specific upgrades to vintage equipment that GMP has experienced issues with, such as replacing specific types of circuit breakers due to bearings sticking, close latches malfunctioning, dash pots malfunctioning, as well as spare parts becoming obsolete. GMP is also moving towards upgrading vintage technology that is no longer supported, such as Remote Terminal Units, which GMP plans to replace over a five-year period, allowing for migration to new technology utilizing modern digital communication between the master station and field devices.

In addition to addressing asset management of infrastructure, GMP is also undertaking some projects to improve substation reliability and operability by increasing the capacity of substations. This improves reliability for GMP customers. For example, feeder backup capability is an effective method of improving reliability. After a fault has been isolated, feeder backup allows sections of the faulted feeder to be restored from another feeder or substation until the faulted segment can be repaired. In order to achieve feeder backup capability, substation transformers and equipment must be capable of serving their normal load while being able to pick up the additional load of another feeder or substation at the same time. Increased transformer capacity allows for increased operating flexibility for feeder backup during planned and emergency outages, which improves reliability to serve present load. There are several substation projects in the interim and rate periods that are being completed to establish or enhance such backup capability.

For example, in 2019 an important project includes investing $2,774,100 in the Barre South End Substation for reliability and safety improvements. The primary reason for this project is to provide greater area operating flexibility for feeder backup during planned and emergency outages, improving customers' reliability for the entire Barre area. GMP has a regulatory obligation to address the reliability issues in the Barre area, and the project is necessary to provide customers with reliable service. As described in Docket No. 8069, GMP sought authorization from the PUC to consolidate the three existing distribution voltages in the Barre area to 12.47 kV. The PUC approved the first segment of this overall strategy, namely the reconstruction and upgrade of the Barre North End substation, in its order in Docket No. 8846 dated February 16, 2017. The Barre #63 North End substation rebuild is expected to be completed in mid-2018. GMP received PUC approval for the Barre #37 South Substation, in Case No. 17-3862-PET on November 6, 2017.

Details regarding all distribution substation capital expenditures for the interim rate period and the rate period are provided in **Exhibit GMP-JRF-2.**

Q18. Please describe the type of projects included in the Transmission Line category.

A18. The Transmission Line projects to be undertaken by GMP in the interim rate period and the rate period include reconductoring, structure replacements, and grid automation to address reliability, safety, and the potential overloading of lines. We anticipate spending an estimated $8,009,046 million in the interim rate period and an estimated $3,227,953 million in the rate period. A list of the Transmission Line capital expenditures is

contained in **Exhibit GMP-JRF-2**, which also includes a description of each of the proposed projects. I describe one of the major transmission line projects below.

Q19. Can you please provide an example of the type of a Transmission Line project included in this filing?

A19. Yes. A good example is the reconductoring work on the transmission line between Evergreen Tap and West Rutland (Line 43). This project will enhance the connectivity and consequent reliability of the 46 kV subtransmission system in Central Vermont. This reconductoring was identified in the Rutland Reliability Plan filed with the Public Utility Commission in April 2015 as a cost-effective solution to provide backup reliability to 30 MW of load, currently single-sourced, as well as providing increased voltage support for the area's 46-kV network. This project will rebuild approximately 0.94 miles of 46kV transmission line from Evergreen Tap to West Rutland Substation (Line 43) with 477 MCM ACSR conductor. The larger conductor on Line 43 allows this radial feed to become part of the looped transmission system in the Rutland Area. The existing Gang Operated Air Break (634) switch on Line 43 pole 1 is proposed to be replaced with a SCADA-controlled Motor Operated Load Break ("MOLB") switch, and two additional SCADA-controlled MOLB switches will be installed, both to improve system reliability. GMP will invest $643,382 on this reconductoring project in 2019.

Q20. Please describe the type of projects included in the Transmission Substation category.

A20. GMP's Transmission Substation capital expenditures for the interim rate period and rate period are focused on reliability and safety projects, which involve replacing substation equipment that has reached the end of its service life or become obsolete and implementing power quality improvements. GMP plans to invest $5,566,335 million in the interim rate period and $348,247 million in the rate period. A list of the transmission substation capital expenditures for the interim rate period and rate period is contained in **Exhibit GMP-JRF-2.**

As with the distribution substations, many of our transmission substation transformers, breakers, reclosers, and protection systems are 30 years old or older. The probability of failure starts increasing after 30 years of service and continues to increase as the age profile for equipment increases. Although proper maintenance and diagnostic testing can extend the life of substation transformers and other equipment, eventually it must be replaced because of failure risk, obsolescence, or the unavailability of spare parts.

Q21. Please describe an example of a Transmission Substation project in this filing.

A21. In the rate period, we plan on investing $1,168,538 in the West Rutland Transmission Substation. This project's justification is primarily reliability. The project improves reliability with in-kind replacement of obsolete equipment such as breakers and instrument transformers, the style and vintage of which has caused reliability problems.

Additional reliability enhancements are being realized with the installation of new 46kV breakers to enable the 46kV system to be networked rather than radial. This project was identified in the Rutland Reliability Plan filed with the Public Utility Commission in April 2015 as a cost-effective solution to provide backup reliability to 30 MW of load, currently single-sourced, as well as providing increased voltage support for the area's 46-kV network. The upgrades at the West Rutland Transmission Substation consist of adding two 46kV transmission breakers (B-4 and B-5). The two existing 1969 vintage Oil Circuit Breakers (B-7 and B-56) will be 49 years old when replaced. GMP has had failures of this style and vintage of breakers. The bus and line instrument transformers are being replaced as they have reached their limit for useful life. The new breakers will be Vacuum Circuit Breakers, which will reduce the possibility of an oil spill or leakage, protecting the environment. The substation also will be equipped with new relays and a security system.

The detailed description and project justifications for the interim rate period and rate period for Transmission Substation work is provided in **Exhibit GMP-JRF-2.**

Q22. Can you explain and give more detail on your T&D projects that exceed $2,000,000?

A22. Yes. We have four T&D projects that exceed $2,000,000. These are:

- Project #148600 - Reconductoring Line 37 (MST to Florence) - $2,928,944
- Project #143591 - South Brattleboro Distribution Substation Rebuild - $2,625,972
- Project #143593 - Barre #37 South Sub Rebuild - $2,774,100

- Project #143595 - Barre North End Rebuild - $2,216,427

We did a thorough financial analysis of each of these important projects and determined that none of them required a more detailed cost benefit analysis because they are reliability projects that do not have viable alternative solutions. This determination was reviewed and approved by the Capital Management Team as well. Exhibit 2 to the MOU establishes the standards agreed upon by the Department and GMP regarding the documentation that is required in a traditional rate case to show that a proposed capital project is known and measurable. While the MOU provides a presumption that cost benefit analyses will be done for all Major projects (those projects with costs above $2,000,000), a cost benefit analysis is not required for projects that are:

- designated to address an immediate safety hazard;
- an in-kind replacement of equipment that is damaged or no longer functionally useful for its intended purpose;
- intended to address a regulatory requirement or is a reliability project and viable alternatives are not reasonably available for the project.

Each of the four projects identified above fall into the last category—reliability projects without viable alternatives. The L37 reconductoring project is a reliability project to enhance feeder backup for the Rutland area and is the least-cost alternative. The Certificate of Public Good for that project was issued on May 25, 2017 in Docket No. 8867 and the project is part of the recommendations in the Rutland Reliability Plan submitted to the PUC in 2015. The PUC also approved the Rutland Area Reliability Plan Upgrade in its order in Docket No. 8867 dated May 25, 2017.

Similarly, the three substation projects identified above received approval from the PUC and are reliability projects without viable alternative solutions. The South Brattleboro distribution substation rebuild is a reliability project to enhance the feeder backup for the Brattleboro area, approved in Docket No. 8778 on September 12, 2016, and the Barre South End and Barre North End distribution substation rebuilds are reliability projects to enhance feeder backup for the Barre area. The PUC approved the upgrade of the Barre North End substation in Docket No. 8846 on February 16, 2017 and approved the Barre #37 South Substation rebuild in Case No. 17-3862-PET on November 6, 2017.

Q23. Can you please explain the purpose of the T&D Blankets?

A23. Yes. Blankets are generally used for categories of spending where the anticipated level and need for the spending is known based on historical experience, but the exact location of work or the individual projects that will be required cannot always be known in advance. For the Distribution Line Blanket, the projects may include but are not limited to (1) reconstruction and rebuild projects primarily for safety, efficiency, and reliability of the distribution system; (2) customer-requested line extensions, relocations, and upgrades; (3) road relocation projects (relocating T&D facilities for state- or municipality-initiated road or bridge construction); and (4) third-party reconstruction projects (telephone or cable requests to upgrade and relocate joint facilities).

GMP cannot dictate the timing of many of these types of projects, for example when the state or a municipality decides a line must be relocated, a customer needs a

service installed, a renewable energy project must be interconnected, or a car damages a pole. These events can affect the timing of construction and in-service dates for planned GMP projects, which is precisely why it is important to keep them in the blanket. This unknown schedule does not make the projects unimportant; it just means they cannot always be planned in advance like significant transmission line projects. And of all the projects GMP undertakes, these type of projects, like distribution reliability projects, have the most immediate and obvious impact on our customers through reduced and shortened outages and the quality of power delivered.

The need to quickly undertake these thousands of projects, coupled with the difficulty of predicting when they will occur, given the many factors affecting their timing, requires us to have a financial mechanism to address these needs quickly and efficiency. In this way, when the projects are ready to construct, GMP can get them done for our customers.

Q24. Can you identify the different blankets used for T&D projects?

A24. There are four blanket categories in T& D capital projects: 1) Distribution Equipment Purchases, 2) Distribution Lines, 3) Distribution Substations, and 4) Transmission Lines and Substations. The Distribution Equipment Purchases blanket includes three equipment purchase blanket WOs for the purchase of transformers (WO36), meters (WO38), and regulators and capacitors (WO37). These capital purchases permit the installation of new or replacement of deteriorated, obsolete, or failed equipment on the system. The Distribution Lines blanket is for distribution line projects $250,000 or less. This blanket

is for expenditures to address distribution line asset management issues, road and bridge relocations, pole replacements requested by telephone and cable companies, and distribution line enhancements to improve the safety and reliability of the system. GMP continually examines our equipment and circuits to identify capital reconstruction and additions based on asset management, outage history and impact on customers, safety of employees and customers, and cost. Blankets are also included within the Distribution Substations and Transmission Lines and Substations for project expenditures related to unforeseen needs or to replace or repair deteriorated or failed equipment in order to maintain system capability and reliability. I describe each blanket in more detail below.

Q25. How are the proposed blanket amounts in Exhibit GMP-JRF-2 determined?

A25. Cost estimates for T&D blanket WOs are established by reviewing historical spending in each of the functional blanket work order categories. For rate base purposes, the lesser of a 5-year historical average or the actual budget, adjusted for inflation, was used. Projects in the blanket work order categories have variable in-service dates and are closed monthly or quarterly. The 5-year historical average is calculated based on the actual cost of each of the last five years and inflating that cost on an annual basis by the appropriate CPI into 2019 costs. Then each of the five inflated costs is averaged to determine the 5-year average cost. The actual budget cost is determined by reviewing the historical actual spending, the previous year's budget, and the Handy Whitman Index of Public Utility Construction Costs (which tailors construction cost indexes specifically to the utility industry) and adjusting for unusual spending (e.g. a larger number of transformers due to

large conversion projects such as Barre). As stated above, the lesser of a 5-year historical average or the actual budget is used for rate purposes.

Q26. Are there any significant differences in the way blankets are used in this filing as compared to previous filings?

A26. Yes, in the last filing, the Distribution Line Category was one blanket for all distribution line projects. Pursuant to the MOU between GMP and the Department mentioned in response to Question 13 above, in this filing each distribution line project with an estimated cost greater than $250,000 has been included as an individual project. Projects equal to or less than this amount have been included only in the blanket, as in the last rate case. As a result, there are 36 individual projects in the Distribution Line category, in addition to the Distribution Line blanket. GMP plans to invest $34,558,320 million in the interim rate period and $20,167,952 million in the rate period for the Distribution Line category.

Q27. Can you describe one of these 36 individual projects in the Distribution Line category?

A27. Yes, the Bethel 28 circuit upgrade is a good example. As described in response to Question 26, the Distribution Lines Blanket and the individual projects that cost greater than $250,000 are most often reconstruction and rebuild projects that are primarily for improving the safety, efficiency, and reliability of the distribution system. The Bethel BE-G28 circuit is one of the twenty worst circuits identified in our Rule 4.900 report. In

this project we will update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. The addition of a covered spacer cable wire and bringing poles to the road will significantly improve the reliability of this line. The project also is an effort to storm-harden the entire line in conjunction with other projects on this circuit/line. With these efforts, we can achieve improved reliability to the Bethel area.

Q28. Please describe the type of capital expenditures included in the Distribution Equipment Purchases Blankets.

A28. This category includes three equipment purchase blanket WOs for the purchase of transformers, meters, and regulators and capacitors. These capital purchases permit the installation of new or replacement of deteriorated, obsolete, or failed equipment on the system. The total for the three Distribution Equipment Purchase Blankets included in rate base are $6,977,123 million for the interim period and $4,115,123 million for the rate period.

Q29. Please describe the type of projects included in the Distribution Line Blanket category for the interim period and rate period.

A29. Distribution Line Blanket projects, which include reconstruction projects and minor additions costing $250,000 or less can be broken out into four primary categories.

1. The first category consists of reconstruction and rebuild projects that are primarily for improving the safety, efficiency, and reliability of the distribution system.

These projects include: voltage conversions, fuse coordination, relocation of lines to the road to improve reliability, and replacement of old and deteriorated plant at the end of its service life. This category includes investments in distribution line equipment needed to facilitate distribution automation projects, as well as small capital improvements.

2. The second category is customer-requested line extensions, relocations, and upgrades. These projects add new plant to our system to serve a new customer, per the request of the customer. These customer requests include distributed generation projects that require capital upgrades of our infrastructure to enable the customer to interconnect. We follow our line extension tariff and electric generation interconnection rules 5.100 and 5.500 to charge the customer the appropriate contribution in aid to construction for these requests.

3. The third category is for road relocation projects that involve relocating T&D facilities where the present location interferes with state- or municipality-initiated road or bridge construction.

4. The fourth category includes third-party reconstruction projects in which a telephone or cable company requests to upgrade and relocate joint facilities in order to accommodate their service requirements. GMP is required to do this work as part of the third-party attachment tariff, and joint-use and joint-ownership agreements that currently exist with the telecommunication companies operating in the state.

Q30. Please describe the type of capital expenditures included in the Distribution and Transmission Substations blankets.

A30. The capital blankets for the transmission substations and lines (WO32) includes individual project expenditures that are needed to replace or repair deteriorated or failed equipment in transmission substations and transmission lines in order to maintain system capability and reliability. We know these types of projects will occur based on historical experience, but don't always know the exact location of equipment that will require replacement in any given year. Typical projects in this blanket work order include but are not limited to replacement of equipment such as lightening arresters, batteries, breakers, transmission poles, and insulators. The Distribution Substation (WO34) includes a number of unforeseen individual project expenditures to replace or repair deteriorated or failed equipment in distribution substations in order to maintain system capability and reliability.

Q31. Does this conclude your testimony?

A31. Yes.