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**South Dakota Infrastructure Rider  
Project List and Descriptions**

**Existing Rider Projects**

The following projects were approved for recovery by the Commission in the Company's Infrastructure Rider in Docket No. EL14-058, and re-affirmed for cost recovery most recently in Docket No. EL19-035:

- MNGP Extended Power Uprate (Monticello LCM/EPU) (w/o 10245258)<sup>1</sup>
- PI-9 TN-40 Casks (Prairie Island Casks #39-47) (w/o 11101522)
- PI-Relicense ISFSI (Prairie Island ISFSI Relicensing) (w/o 10798851)
- PI U2 Generator Replacement (w/o 11808202)
- PI U2 GSU Transformer Replacement (w/o 11808219)
- MNGP EDG Tornado Missile Protection (w/o 11946062)
- MNGP Fukushima Modifications (w/o 11503439)
- PI LR Ph II-U2 MRP-227A Implementation (w/o 11812440)
- PI-NFPA 805 Fire Model (w/o 11044898)
- PI U2 HDTP Speed Control Upgrade (w/o 11230621)
- BRD0C Border Wind ND (w/o 11551351)
- PLV0C Pleasant Valley Wind (w/o 11869600)
- SHC1C U1 Couton Bottom Replacement (w/o 10935185)
- BDS0C Install Package Boiler (w/o 11345791)
- SHC3C Motor Control Sys PL (w/o 11487734)
- Midtown 115kV line (w/os 11219377 and 11627836)
- NSM0953 Galloping Mitigation (w/o 11892875)
- GIST-III Computer Software (w/o 11465739)
- Hiawatha Dam Interconnect Substation (w/o 11083245)
- Scott County 345 kV Expansion, Substation (w/o 11806389)
- BS-Fcst-BD-SW-CM-M (w/o 11218029)
- PI-Repl Instrument Air Compressor (w/o 10799550)

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<sup>1</sup> To implement a provision of the Settlement, cost recovery for the Monticello LCM/EPU project did not roll into base rates, but rather remained in the Infrastructure Rider.

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The following projects were approved for recovery by the Commission in the Company's Infrastructure Rider in Docket No. EL15-038, and re-affirmed for cost recovery most recently in Docket No. EL19-035:

- Prairie 3rd 230/115 kV tra (w/o 11491534)
- PI Emerg Resp Equipment FLEX (w/o 11634222)
- PI U1 HDTP Speed Control U (w/o 11101124)
- SHC2 U2 DCS Controls Repl (w/o 11648818)
- SHC2C U2 Turbine EHC Ctrls (w/o 11488127)
- Dynamic EMS Environment Phase (w/o 10818773)
- Work and Asset Ph 1 SW MN (w/o 11491932)
- MNGP Security Physical Upgrade (w/o 12076265)
- PI Sfgds CL Pump Redesign (w/o 12075477)
- 760-Red Wing to Wabasha (w/o 11776427)
- NSM0953 Galloping Mitigation (w/o 12077207& 12051340)
- HBC7C U7 HGP/Combustion Inspec (w/o 10785655)
- SHC1C U1 DCS Controls Repl PH (w/o 11350867)
- MNGP Rplc IMUX Front End Proce (w/o 11366818)
- GIST-II Computer SoftwareNSPM (w/o 11434783)
- MNGP Cyber Security 08-09 (w/o 11468481)
- Purch EMS DEMS Ph2 HW MN (w/o 11584375)
- PI Fan Coil Unit Face Repl (w/o 11812451)
- PI NFPA 805 -08 Fire Detection (w/o 11825933)
- MNGP EDG Fuel Oil Train Separation (w/o 11926489)
- PI FLEX Storage Building (w/o 12035378)
- CRT0C Courtenay Wind Farm Construct (w/o 12173639)
- RIV9C-U9 HGP Inspection No 1 (w/o 11215945)

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The following projects were approved for recovery by the Commission in the Company's Infrastructure Rider in Docket No. EL16-032, and re-affirmed for cost recovery most recently in Docket No. EL19-035:

- PI-Screenhouse Cl Header P (w/o 11100514)
- SHC 3 Turbine EHC Controls (w/o 11487740)
- SHC3 Boiler Intermediate and Finishing Superheater replacement (A.0001574.147)
- PI Reactor Coolant Pump Rebuild (A.0000035.211)
- MT TSTF-523 Vent Installation (A.0000029.015)
- MT EDG Fuel Oil Pump Mtr Rplc 1R28 (A.0000017.116)
- MT KM 480VAC Cubicle Rplc (A.0000029.018)

The following projects were approved for recovery by the Commission in the Company's Infrastructure Rider in Docket No. EL17-039, and re-affirmed for cost recovery most recently in Docket No. EL19-035:

- MNGP Hardened Vents & Filt (11871747 / A.0000043.005)
- PI 2M 2RS 2RX Transformer (11503758 / A.0000035.170)
- PI U1 Generator Replacemnt (11808178 / A.0000037.003)
- MNGP DAS & PPCS Rplc (A.0000017.003)
- MNGP 2018 Dry Fuel Storage Loa (A.0000060.001)
- PI 4.16 KV Bus Modifications (A.0000040.016 )
- NSPM Tline ELR 2016 69kV Line (A.0000504.025)

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The following projects were approved for recovery by the Commission in the Company's Infrastructure Rider in Docket No. EL18-040, and re-affirmed for cost recovery most recently in Docket No. EL19-035:

- PI 1R Transformer Replacement (11503753)
- G100-Blazing Star I Wind Farm (A.0001701.001, A0001701.002, A0001701.003, A0001701.004, A0001701.005)
- FOX G100-Foxtail Wind Farm (A.0001703.001, A.0001703.002, A.0001703.003, A.0001703.004)
- G100-Crowned Ridge BOT Wind Farm (A0001705.001)
- G100-Lake Benton BOT Wind Farm (A0001706.001)
- Benson Biomass PPA Termination Costs
- Laurentian Biomass PPA Termination Costs
- Pine Bend Landfill Gas PPA Termination Costs

The following projects were approved for recovery by the Commission in the Company's Infrastructure Rider in Docket No. EL19-035:

- Sherco Unit 3 Unit Protection PLC (11488116)
- Blazing Star II Wind Project (A.0001702.001, A0001702.002, A0001702.003, A0001702.004, A0001701.005)
- Freeborn Wind Project (A.0001704.001, A0001702.002, A0001702.003, A0001702.004, A0001702.005)

The following projects were approved for recovery by the Commission in the Company's Infrastructure Rider in Docket No. EL20-026:

- Dakota Range I and II (A.0001707.001)
- Jeffers Wind (A.0001721.001)
- Community Wind North (NA)
- Mower County (A.0001724.001)

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The following projects were approved for recovery by the Commission in the Company's Infrastructure Rider in Docket No. EL21-028:

- Northern Wind and Rock Aetna
- Nobles Wind

**Known and Measurable Projects Initially Proposed in Rate Case**

Per the Settlement Stipulation in Docket No. EL22-017, the Company has refreshed the Infrastructure Rider to recover certain discrete costs for capital additions in 2023 that are not included in the revenue deficiency for purposes of setting base rates and to recover costs for other capital projects. As such, the Company has included the following projects in the 2023-2024 Infrastructure Rider revenue requirements which were initially filed as known and measurable projects in the rate case.

A.0001576.022-GDM Grand Meadow Repower. See the Direct Testimony of Company witness Farah L. Mandich in Docket No. EL22-017 for a full description of this project, page 45-52.

**Prairie Island Transformer Replacement**

- A.0000035.186-PI CT11,CT12 Transformer
- A.0000035.313-PI 121-128 Intake Transformer
- A.0000035.403-PI 2022 Capital Maintenance

See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, pages 12-13.

**Prairie Island Upgrades: A.0000040.069-PI U2 Baffle Bolt Replacement.** See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 13.

A.0000045.001-Prairie Island Dry Cask Storage (48-64). See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 12.

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A.0000053.006-Prairie Island Wireless Network Expansion. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 13.

A.0000073.005-Prairie Island 122 Cooling Tower Rebuild. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, pages 11-12.

A.0001320.007-NSPM Comm Network Pro. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 1.

Angus Anson Plant: A.0001571.023-ANS2 CT Maj OH Replacement. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, pages 3-4.

A.0001575.170-High Bridge Unit 8 Major Combustion Turbine Overhaul. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 8.

A.0006056.002-MN-Distribution Fleet New Unit Purchase. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 8.

A.0006056.091-MN Transportation Units Over 50K. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 8.

A.0010021.007-SD - Pole Replacement Blanket. See the Direct Testimony of Company witness Marty D. Mensen in Docket No. EL22-017 for a full description of this project, pages 14-15.

A.0010147.003-Louse Line and Sub. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, pages 10-11.

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Great Plains Area Sub

- A.0010174.001-Great Plains Area Sub
- A.0010174.002-LINE Install Great Pl

See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 9.

D.0001804.355-Critical Infrastructure Program (CIP) Substation Ph2 SW. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 1.

D.0001810.119-Marshall Operations Center. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 11.

Service Centers

- D.0001810.118-Chanhassen New SC
- D.0001810.139-Belle Plaine SC New
- D.0001810.144-Grand Forks New Const
- D.0001810.146-Belgrade SC New

See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 14.

D.0001853.003-ITC-Distributed Intelligence SW. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 4.

AMI and FAN

- D.0001900.016-FAN - AGIS - NSPM - M
- D.0001901.008-AGIS Meter Data Management
- D.0001901.057-AMI-DIST-NSPM-SD Full
- D.0001901.071-AMI-SW-License-BS-NSP

See Attachment 12A to this Petition for a full description of our AMI and FAN program efforts.

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D.0002038.004-Dynamic DEMS Environment Ph4 HW MN-10756. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 1.

D.0002181.005-ITC-Strategic Fiber D. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 7.

D.0002223.006-ITC-Customer Care IVR. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, pages 4-5.

D.0002240.006-ITC - HCM Core Payroll. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 2.

D.0002333.001-ITC Independent System Operators (ISO) Interface & Stlm. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 2.

D.0002488.005-ITC-LFCM Operational Technology Modernization. See Schedule 11 of Company witness Benjamin C. Halama's Direct Testimony in Docket No. EL22-017 for a full description of this project, page 3.

### **Settlement Stipulation Proposed 2023 Additional Rider Projects**

Per the Settlement Stipulation in Docket No. EL22-017, the Company refreshed the Infrastructure Rider to recover certain discrete costs for capital additions in 2023 that are not included in the revenue deficiency for purposes of setting base rates and to recover costs for other capital projects. As such, the Company included the following projects with projected in-service dates in 2023 in the 2023-2024 Infrastructure Rider revenue requirements.

A.0000017.165-Monticello 2022 Maintenance Blanket. This project is a forecast of smaller discrete projects during the calendar year that are identified via a repair vs. maintain approach. Since many of these projects are identified during the calendar year as equipment issues emerge, the budget is prepared as a blanket rather than a series of specific projects, as most of the work is unplanned. When work is needed,



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replacement is weighed against the alternative of maintenance work on the existing equipment to determine the most cost-effective solution.

A.0000017.215 Monticello Replace Turbine Stop Valves. This project includes performing maintenance on the main turbine steam valves and replacing the main turbine steam valve internal components with new disc, stem, and pressure seal as applicable. The benefits of this approach for the project in question are that all new parts are used, reducing the outage schedule impact, while maximizing equipment reliability with all parts at original equipment manufacturer (OEM) tolerances. Additionally, O&M costs associated with the outage are reduced as well. Alternatively, the traditional approach of disassembling, cleaning, inspecting, and reassembling was considered, but was determined in this instance to be less cost effective for the reasons discussed above.

A.0000035.456-PI Prairie Island Unit 2 Reactor Vessel Lower Radial Clevis Bolts. The PI Unit 2 Reactor Vessel (RV) Lower Radial Clevis Bolt Project at Prairie Island Nuclear Generating Plant (PINGP) will replace a minimum pattern of clevis insert bolts in the Unit 2 reactor vessel to meet industry requirements and reduce the commercial risk of clevis insert bolt failures. The project will be implemented during the refueling outage in the Fall of 2023. The project scope includes procurement, fabrication, engineering and bolt replacement services.

Alternative lower cost options were considered. OG-21-160, "PWR Lower Radial Support Clevis Insert X-750 Bolt Inspection Requirements," was issued by the Nuclear Energy Institute (NEI) with the requirement that clevis insert bolts must be inspected and/or replaced at the next scheduled core barrel pull after July 1, 2023, or prior to 55 calendar years of plant operation, whichever comes first. Thus, we are not obligated to replace the clevis insert bolts at Prairie Island. The lowest cost option could be to inspect the bolts using ultrasonic testing (UT), depending on whether and to what extent the testing indicates bolts should be replaced. The Company elected to proactively replace a minimum pattern of its clevis insert bolts and not perform the inspection because the bolts are made of Alloy X-750 with a heat treatment that is susceptible to primary water stress corrosion cracking (PWSCC). Based on operating experience from other nuclear plants with a similar design, Prairie Island is unlikely to pass a UT examination of its clevis insert bolts, in which case an emergent bolt replacement campaign could be necessary. Additionally, even if the bolts passed their initial inspection, they would still be vulnerable to the PWSCC failure mechanism and could fail prior to the next inspection. This condition could lead to a situation where

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the clevis insert dislodges, which would result in the costs and disruption of an extended refueling outage duration and challenging repairs.

A.0001573.325-BD Black Dog S2 High Pressure Turbine Blades Replacement. The Black Dog Unit 2 high pressure blade replacement was an emergent project resulting from damage to the high pressure steam turbine discovered during the planned 2022 outage. The original equipment manufacturer, Siemens, required replacement of four rows of high-pressure steam turbine blades before returning the unit to service. The steam turbine rotor was shipped to Charlotte, NC so Siemens could perform the work at its facility there. The work included a high-speed balance of the rotor. There were no other practical alternatives to consider as the replacement of the turbine blades were required to return the unit to service.

A.0005553.001-COMM Communications Fiber Buildout. This project is the distribution portion of the Company's overall network communications program. The goal of the project is to utilize the optical ground wire on transmission lines and the dedicated leased fiber communication paths to improve network reliability.

0A.0005587.001-South Dakota Major Storm Recovery. This project captures the distribution capital costs required in order to restore power to customers after a major storm event.

A.0006056.367-Distribution Fleet ADD Unit Purchase. Additional fleet units are periodically requested by the business based on their needs, including changes or increases in work and increases in the number of crew members. This project represents such requests for the Distribution organization. When these individual requests are received, an analysis is completed to ensure other fleet units are not currently available to meet the needs of the request. The alternative would be to increase the number of rental units which would result in a higher per unit cost.

A.0006056.369-Fleet ADD Units El Trans >50K. Additional fleet units are periodically requested by the business based on their business needs, including changes or increases in work and increases in the number of crew members. This project represents such requests for the Transmission organization. When these requests are received, an analysis is completed to ensure other units are not currently available to meet the needs of the request. The alternative would be to increase the number of rental units which would result in a higher per unit cost.

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A.0010013.001-SD - OH Relocation Blanket. This project covers the associated costs for discrete projects where the Company has been mandated to relocate overhead facilities due to an external driver, such as a road reconstruction project. This project covers the capital distribution costs for projects that are less than \$250,000 per project. As the Company is required to complete these mandated projects, there are not alternatives.

A.0010021.001-SD - OH Rebuild Blanket. This project covers the associated costs for discrete overhead facilities projects to ensure continued reliability. This project covers the capital distribution costs for projects that are less than \$250,000 per project. Projects typically originate due to poor reliability or capacity issues. Engineering often identifies these from our reliability programs, which identify devices or customers that have experienced multiple interruptions.

A.0010029.001-SD - URD Cable Replacement Blanket. This project is the underground cable replacement program. The program uses documented criteria to submit and evaluate tap cable replacement projects based on the number of outages that have occurred over time. The alternative to replacement is to leave the existing cables in place; the project criteria are used to determine when replacement is the appropriate alternative.

A.0010079.003-Rebuild Cherry Creek CHC321. This project was initiated to mitigate line galloping to ensure reliability on Cherry Creek Feeder #321. To do that, new distribution poles are being installed between existing transmission structure in order to minimize line galloping. Typically, distribution lines are attached below transmission lines on the same poles, but in this case the spans were too long.

D.0001856.001-ITC Monitoring Device Management SW 20017. The Monitoring Device Management System is a near 30-year-old mainframe system that is the primary application that houses the business processes associated with the meter lifecycle, including asset tracking and testing, cost accounting, and select work management functions. This project will replace these capabilities on a scalable cloud-based SAP-ISU (Industry Solution for Utilities) environment while reducing operational risks. The alternative to the project would be to continue with the legacy mainframe; however, that option is not preferred as it will not reduce operational risks.

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D.0001927.001-ITC-Marshall Operation Center NP M. The Marshall Operations Center project will combine both Distribution and Transmission Control Centers in one room in the new facility. This project scope covers the technology that is required by the new facility to support the requirements of the different teams so they can operate using Corp, Operational Technology (OT) and dark fiber networks. The technology will cover all servers, cables, switches, monitors, keyboards, audio-visual equipment, wireless network and radios. Additionally, the Advanced Distribution Management System (ADMS) requires the OT network run from this room to a 2nd floor location to cover the ADMS lab. The project is estimated to go in-service at the end of 2023, contingent upon the construction of the building and the main distribution frame being completed to support this area.

D.0002011.013-ITC-WAN Routine HW NSPMN. This project helps ensure reliability for the provision of communication circuits and associated hardware for the connection of substations for transmission and distribution. Demand is driven by our end customers and is based on needed expansions and upgrades to the energy grid.

D.0002153.023-ITC-Microsoft License SW 200148. This project will complete the enterprise Microsoft license renewal. Our enterprise agreement with Microsoft expires in 2023. A small portion of this project will involve determining the exact number of licenses that we will need to renew, prior to the renewal of the number of licenses needed. Each E5 Microsoft license provides Xcel Energy personnel with access to email, Microsoft Teams, SharePoint, the Microsoft Office Suite, and other collaboration tools that are vital to operating a business. No least cost alternatives were considered because Microsoft is the industry leader for office tools.

D.0002350.003-ITC-SAS BookRunner Upgrade SW 200134. Under this project, SAS will provide services to modernize the previously implemented version of SAS BookRunner to SAS Risk Engine, SAS Visual Analytics, SAS Intelligent Decisioning, and SAS Model Manager on SAS Viya in up to four environments (three SAS-hosted environments for Phase 1A, one on-premises for Phase 1B). Additional services will include: data cleanup and data migration from SAS BookRunner to SAS Risk Engine, updates to data integration, migration of reporting and outputs to SAS Visual Analytics, updates to SAS code and SAS stored processes, knowledge transfer and mentoring and support during the 30-day post go-live period following Phase 1B.

D.0002515.003-ITC - OT Monitoring 2021 NSPW. This project was primarily focused on deploying a technology to detect network based cyberattacks on our

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operating technologies environment. The Company needed a solution that recognized the most complex cyber-attacks targeting industrial control systems. The project also required that the solution provide a centralized facility for the incident responders to prioritize and manage the remediation of detection events. The Company had a least cost alternative in place, but the least cost alternative was determined to be far inferior to the Dragos solution selected. The three main benefits of Dragos are: Dragos leads the industry with the collection and operationalization of threat intelligence for attacks on industrial control systems; Dragos is capable of inspecting larger volumes of data than competitive products; and Xcel Energy is an early adopter of this technology, and this relationship gives our organization additional leverage with the vendor to create a solution that addresses our specific security concerns.

D.0002518.001-ITC-Lifecycle Management (LFCM) Data Storage Rout HW NP MN. Life Cycle Management (LFCM) Data Storage refreshes or consolidates end of life hardware or grows storage and backup capacity to meet the storage and recovery needs of the business. This year, there is also a strategic storage initiative to evaluate a potential shift to a more affordable onsite solution. Determinations on consolidation involve cloud solutions risk-benefit analyses to determine right size storage environments.

### **Proposed New Infrastructure Projects**

Per the Settlement Stipulation in Docket No. EL22-017, the Company is proposing to add newly identified projects in service in 2023, the Red Wing and Wilmarth projects. The Red Wing and Wilmarth projects are necessary to keep those assets operational through the end of 2027, after extending their lives, as outlined in Table 4 of the Direct Testimony of Company witness Laurie J. Wold.

We also remove one 2023 project that was previously identified in the Settlement Stipulation, the 6<sup>th</sup> Street Bridge Relocation, because we no longer forecast a 2023 or 2024 in-service date for the project.

In addition, projects in service in 2024 or later are subject to the \$250,000 threshold outlined in the Settlement Stipulation. The Company has identified one project, Sherco Solar, meeting the threshold.

A.0000017.203-Monticello 2023 Maintenance Blanket. This project is a forecast of smaller discrete projects during the calendar year that are identified via a repair vs.

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maintain approach. Since many of these projects are identified during the calendar year as equipment issues emerge, the budget is prepared as a blanket rather than a series of specific projects, as most of the work is unplanned. When work is needed, replacement is weighed against the alternative of maintenance work on the existing equipment to determine the most cost-effective solution.

D.0001994.063 ITC-VMWare-200148-MN. This project is an early renewal of the VMWare license agreement. It resets the term to 60 months from new contract signature, extending an additional 2.5 years beyond current expiration. This project specifically upgrades technology via Tanzu licenses, prepares for growth with additional cores, provides price protection prior to Broadcom acquisition of VMWare in October 2023, allows us to trade in perpetual licenses before they are obsolete – recouping 100% of depreciation – and converts perpetual to subscription to achieve some O&M savings.

A.0010071.010-6th Street Bridge Relocation. Not included in the Infrastructure Rider because it will not be in service in 2023 or 2024.

**Red Wing (REW)**

A.0001562.051 REW1C Replace Unit 1 Traveling Gate Bed. This project, completed in 2023, replaced all components in the Red Wing Generating Station Unit 1 boiler traveling grate bed. This includes the grate bars, rails, sprockets, drive system, bearings and all support pieces. Based on past best practice and current notable wear identified, the grate bed is typically on a 5-year replacement cycle. The grate bed helps to maintain proper combustion and ash removal which leads to decreased downtime and ensures we meet all emissions requirements.

A.0001562.139 REW2C Replace Unit 2 Traveling Gate Bed. This project, completed in 2023, replaced all components in the Unit 2 boiler traveling grate bed. This includes the grate bars, rails, sprockets, drive system, bearings and all support pieces. Based on past best practice and current notable wear identified, the grate bed is typically on a 5-year replacement cycle. The grate bed helps to maintain proper combustion and ash removal which leads to decreased downtime and ensures we meet all emissions requirements.

A.0001562.149 REW1 Replace Unit 1 Superheater-Secondary-2. This project, completed in 2023, replaced the entire secondary half of the Unit 1 boiler superheater.

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This portion of the superheater contains 19 pendants that each have 16 tubes (7 sets of u-bends and 2 hanger tubes). The tubes are made of 2.5" OD, 0.220" Wall SA210-A1 Carbon Steel. Past history and annual non-destructive evaluation thickness data has shown that by the third service year, the secondary superheater is about 40 percent worn out. This increases the chance of having tube leaks which leads to lost burn revenue and a higher safety risk.

A.0001562.207 REW0 Landfill Liner Phase 1. This project, to be completed in 2023, will include the design and construction of a small, 1 to 2 acre expansion of the existing RDF landfill in Red Wing, MN. The construction of a small liner expansion now, rather than waiting until 2026 for the larger new cell construction project, provides additional operational flexibility while management decides whether to extend the fuel contract beyond 2027.

**Wilmarth (WLM)**

A.0001565.077 WLM0C Slaker PLC Replacement. This project was completed in 2023. The Project was to replace the existing Allen-Bradley PLC at the Wilmarth Generating Station for the lime slaking system with a new DeltaV controller that will be fully integrated and provide better automation and control of the entire slaking system. This is a crucial part of our Air Quality Control System (AQCS). Additionally, this project will involve moving the slaking equipment (lime grit auger motor VFD, slurry pumps A, B and C VFD's, etc.) into MCC44 with the rest of the lime slaking equipment. This will require moving some of the existing baghouse equipment currently residing in MCC44 over to MCC45 and 46 where the rest of the Baghouse equipment is. This would group all of the slaking and scrubber equipment for both units together in MCC44, while the equipment for each baghouse would then be in MCC45 and MCC46.

A.0001565.116 WLM1C Unit 1 Static Exciter. This project was completed in 2023. This project replaces the obsolete Basler 200 exciter with a DECS 400N, to bring the unit into compliance with the NSP fleet.

A.0001565.125 WLM2-Replace Unit 2 Boiler Grates 2022. This project was completed in 2023 to replace all grates beds (called 21 grates and 22 grates) in the Unit 2 boiler. This included replacing all grate bars, chains, grate weights, sprockets, pins, seals, and gear boxes. Additional inspections were also completed at the time of installation on the throat linings.

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A.0001565.129 WLM1-Replace Unit 1 Superheater Bundle -12. This project was completed in 2023. The project included the cut out and replacement of all 39 super heat pendants in the unit 1 boiler. In addition, new refractory was needed in the super heat section following install, and new thermocouples were installed on the tubes.

A.0001565.144 WLM99-Replace Walking Floor 2022-17. This project was completed in 2023. The project included the complete replacement of the fuel receiving walking floor. This floor is 118' long x 10' wide. In addition, structural support modifications needed to be completed during the installation, as non-destructive evaluation determined that the base frame was in poor condition. The Hydraulic Power Unit was also replaced during this project, and a new oil cooler was installed.

A.0001565.160 WLM1New Unit 1 ID Fan Motor and VFD. This project was completed in 2023. The project included the installation of a new 600HP motor on the induced draft fan, replacing the existing 450 hp motor. In addition, a new VFD needed to be installed to drive the larger motor. A new concrete base was installed due to the increased size of the motor and the shaft centerlines changing. A new cooling fan was installed to cool the 600HP motor.

A.0001565.163 WLM0-Greensand Filter for Reverse Osmosis Water. This project will be completed fall 2023. The project includes the installation of a new green sand filtration skid for our shallow well. This will allow the plant to use well water for its reverse osmosis (RO) process and thus in the boiler. A new building will be constructed around the well to house the piping and filter skid. Settling tanks will also be installed for water retention following the backflush cycle, per MPCA requirements.

**Sherco Solar (SHC)**

- A.0001574.900-SHC Solar Generating Plant #1A.0001574.901-SHC SS West Collector Sub.
- A.0001574.902-SHC to SSW Line 5651 T-Line.
- A.0001574.903-SHC Solar I El TL 115KV LIB-SHC Rel.
- A.0001574.912-SHC Solar 1 Rose Property Purchase.
- A.0001574.924-ITC- Bus Sys Sherco Solar 1

The Company will develop, own, and operate 460 MW of grid-scale photovoltaic (PV) capacity at the Company's Sherburne County (Sherco) generation facility site.



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The Company will acquire an approximately 1,654-acre solar site under development by National Grid Renewables (NGR) and located northwest of the Sherco generation facility, or Sherco Solar 1. We will combine the Sherco 1 with an approximately 1,826-acre site that has been under development by the Company and located southeast of the Sherco generation facility, or Sherco Solar 2. We will also construct a collector substation at each block and two 345-kilovolt (kV) generation-tie transmission lines to connect the collector substations to the point of interconnect at the existing Sherburne County Substation.

We expect the electricity generated by the Sherco Solar Project to generate enough energy to power approximately 100,000 homes in the Upper Midwest each year and to partially replace the generation of Sherco Unit 2, which will cease operations in 2023. Constructing new solar generation at the Sherco site to meet identified capacity needs in the mid-2020s allows the Company to reutilize our transmission interconnection rights as our coal units cease operations. To ensure our reuse of these interconnection rights is least cost, the Company issued a Request for Proposals (RFP) and conducted a competitive solicitation for solar projects at the Sherco site. The collaboration with NGR was selected through this process.

The total installed capital costs for the Project are estimated to be approximately \$690.1 million without AFUDC. During the course of the acquisition proceeding in Minnesota, the Inflation Reduction Act of 2022 (IRA) was passed into law. The IRA increased the benefits to the Project through the creation of a solar production tax credit (PTC), increased value of the PTC due to specific characteristics of the Project (including being sited in an energy community), and the ability to sell or transfer PTCs. These benefits impact both the Project's levelized cost of energy (LCOE) and revenue requirements, or the costs ultimately borne by customers due to the addition of the Project. The IRA has no direct impact on the Project's capital costs.

Based on the project lifetime costs and expected production, the Company has calculated the levelized cost of energy (LCOE) to be **[PROTECTED DATA BEGINS [REDACTED] PROTECTED DATA ENDS]**. As with other cost components, the actual LCOE can shift depending on any changes in final project costs, tax benefits, and actual project production.

The Company anticipates beginning commercial operations for Sherco Solar 1 by the end of 2024 and for Sherco Solar 2 by the end of 2025. Costs included in the

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Infrastructure Rider at this time are only related to the Sherco Solar 1 portion of the total project.

Further detail regarding the costs of the Sherco Solar projects are included as Attachment 12B, 12C, and 12D.