

**2017 PROJECTS
REFLECTED IN THE
SYSTEM SAFETY AND INTEGRITY RIDER
FOR BLACK HILLS GAS DISTRIBUTION, LLC
IN NEBRASKA**



September 30, 2016

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**2017 PROJECTS REFLECTED IN THE
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I. INTRODUCTION

As set forth on First Revised Sheet Nos. 11-15 of the Nebraska Gas Tariff No. 1 (the “Tariff”) of Black Hills Gas Distribution, LLC d/b/a Black Hills Energy (“BHGD-NE” or the “Company”), Residential Service, Small Commercial Service and Large Commercial Service under Rate Schedules CGS (Choice Gas Service) and ACGS-NSS (Agricultural Choice Gas Service – Non-Seasonal Service) are subject to a System Safety and Integrity Rider (“SSIR”) designed to collect Eligible System Safety and Integrity Costs. The Nebraska Public Service Commission (the “Commission”) approved the SSIR Tariff, with an effective date of November 1, 2014, by its Order Approving Application, In Part, entered in this docket on October 28, 2014, and its Order Modifying Order Approving Application, in Part, entered in this docket on November 4, 2014.

Under the Commission-approved SSIR Tariff, the Company is authorized to collect the revenue requirement of Eligible System Safety and Integrity Costs projected for the period January 1, 2017 through December 31, 2017 through the Safety and Integrity Charge (the “SSIR Charge”) over the period February 1, 2017 through January 31, 2018. The SSIR Charge to be applied to each Rate Schedule is as set forth on the Schedule of Rates and Other Charges, Sheet No. 7 of the Tariff.

As approved by the Commission, the Company is authorized to file this SSIR application for 2017 costs on or before October 1, 2016 with an implementation date of February 1, 2017. The SSIR Tariff requires that this application include pertinent information and supporting data related to eligible SSIR costs, including, at a minimum, SSIR Project descriptions and scopes, SSIR Project costs, and in-service dates.

The SSIR Tariff defines Eligible System Safety and Integrity Costs to mean:

- 1) A return, at a percentage equal to the Company’s currently authorized weighted average cost of capital grossed up for taxes, on the projected increase in the jurisdictional component of the month ending net plant in-service balances associated with the Projects for the particular calendar year in which the SSIR Charge shall be in effect, exclusive of all plant in-service included in the determination of the revenue requirements approved in the Company’s last general rate case;

- 2) The plant-related ownership costs associated with such incremental plant investment, including depreciation, accumulated deferred income taxes, and all taxes including income taxes and property taxes; and
- 3) The projected jurisdictional component of the operation and maintenance expenses related to the Projects for the particular year in which the SSIR Charge shall be in effect.

The return and income taxes and plant related costs associated with improvements or upgrades to facilities, made at the discretion of the Company to extend service or for future growth that is not specifically required by a statute or regulation, shall be excluded from Eligible System Safety and Integrity Costs.

As set forth in the SSIR Tariff, SSIR Projects (also referenced in this filing as “Projects”) mean:

- i. Projects to comply with Code of Federal Regulations (“CFR”) Title 49 (Transportation), Part 192 (Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards), Subpart O (Gas Transmission Pipeline Integrity Management), including Projects in accordance with the Company’s transmission integrity management program (“TIMP”) and Projects in accordance with State enforcement of Subpart O and the Company’s TIMP;
- ii. Projects to comply with CFR Title 49 (Transportation), Part 192 (Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards), Subpart P (Gas Distribution Pipeline Integrity Management), including Projects in accordance with the Company’s distribution integrity management program (“DIMP”) and Projects in accordance with State enforcement of Subpart P and the Company’s DIMP;
- iii. Projects to comply with final rules and regulations of the U.S. Department of Transportation’s Pipeline and Hazardous Materials Safety Administration (“PHMSA”) that become effective on or after the filing date of the application requesting approval of the SSIR; and
- iv. Facility relocation projects with a per-Project total cost of \$20,000 or more, exclusive of all costs that have been, are being, or will be reimbursed otherwise, that are required due to construction or improvement of a highway, road, street, public way or other public work by or on behalf of the United States, the State of Nebraska, a political subdivision of the State of Nebraska or another entity having the power of eminent domain.

As shown in Exhibit 4, Table 3, Page 6 of 6 to this application, BHGD-NE has identified 21 individually numbered Capital SSIR Projects and no Operations and Maintenance Expense SSIR

Projects for the instant filing. In total, BHGD-NE's projected capital expenditures for 2017 SSIR Projects total \$11,809,666.

All of the 21 Projects will be in service in 2017.

Additionally, the Company each year encounters the need to conduct facility relocation projects in connection with municipal infrastructure projects. Municipalities typically do not finalize their plans for infrastructure projects for a particular calendar year, however, until late in the previous calendar year or early in the calendar year in which those projects will be conducted. Consequently, although the Company is aware of several potential municipal infrastructure projects in 2017 (*see* Section II.I below) that may require the Company to conduct facility relocation projects the costs of which are Eligible System Safety and Integrity Costs for recovery through the SSIR Tariff, those Projects are not sufficiently definitive at this time for the Company to request prospective recovery of Eligible System Safety and Integrity Costs through this filing. *See* Project No. 21 (Nebraska Highway Relocation Program) on *Exhibit 4, Table 3, Page 6 of 6* to this application. Therefore, as part of its quarterly surveillance reports, the Company will provide updates of its facility relocation projects in connection with municipal infrastructure projects and, through its October 1, 2017 annual filing, will seek to recover the Eligible System Safety and Integrity Costs associated with those projects. Eligible System Safety and Integrity Costs associated with completed 2016 highway relocation projects have been included in this filing.

As required by the SSIR Tariff, BHGD-NE analyzed these SSIR Projects based upon objective criteria such as, but not limited to: specific regulatory requirements; threat assessment; corrosion control analysis; pipeline vintage; pipeline material; pipeline design and class location; pipeline configuration and segmentation; pipeline system constraints; pipeline replacement history; population density; pipeline maintenance and internal inspection history; pipeline piggability; existence and reliability of pipeline asset and testing records; pipeline leakage and other incident history; subject matter expert knowledge; Project timeframe; weather and climate constraints on the construction season; permitting constraints; probability of pipeline testing failures and dewatering constraints; service outage management; and pipeline source of supply and availability of alternate gas supply.

As part of BHGD-NE's analysis, the SSIR Tariff requires the Company to identify and describe the proposed SSIR Projects that are for high-risk gas infrastructure by providing its risk assessment for each such SSIR Project including, if applicable, the probability of failure, the consequences of failure for the SSIR Project and how the Company prioritized the SSIR Project for which it seeks recovery. There are no SSIR Projects included within this filing that fall into

this category because none of the 21 SSIR Projects is being done within a high consequence area (“HCA”).¹

II. 2017 SSIR PROJECTS

A. Replacement of Bare Steel Distribution Main

1. Background

BHGD-NE operates approximately 4,763 miles of distribution system in Nebraska, of which approximately 593 miles are bare steel distribution main with various dates of installation ranging from the 1930s to approximately 1960. Although age alone does not determine the integrity of a pipeline system, some older pipeline facilities that are constructed of certain materials, including bare steel, may have degraded over time. Even though these bare steel distribution mains are cathodically protected,² it becomes increasingly difficult to maintain effective corrosion protection because of the age of the system. Compared with coated steel pipelines, bare steel pipelines corrode at a higher rate because there is no coating to serve as a barrier between the steel and the soil. Also, many pipeline segments may not meet today’s pipeline construction standards, and some have been exposed to additional threats, such as excavation damage. In addition, there are some early vintage steel pipelines in certain areas that may pose risks because of incomplete records or construction practices not up to today’s standard. Based upon known data, including installation records and construction methods, leakage history, cathodic protection data, damage history and population density, BHGD-NE’s DIMP identifies bare steel segments that are higher risk.

2. SSIR Project Classification

a) Classification Under SSIR Tariff

BHGD-NE identified bare steel distribution main pipeline segments requiring remediation under CFR Title 49, Part 192, Subpart P, DIMP. Section 192.1007 requires a pipeline operator to identify threats, evaluate and risk rank, and identify and implement measures to address risks.

¹ A HCA, in general, is a populated building or outdoor area located within the Potential Impact Radius of a transmission pipeline meeting the occupancy requirements as defined in Section 192.903. Pipeline nominal diameter and maximum allowable operating pressure (MAOP) are the two key attributes that define the Potential Impact Radius of each transmission pipeline segment.

² Cathodic protection is an electrochemical process used to mitigate corrosion of buried steel structures, such as natural gas pipelines made from steel.

b) **Objective Criteria Analyzed**

As required by Section 192.1007, objective criteria that BHGD-NE analyzed for Bare Steel Main Distribution Replacement Projects are: pipeline vintage; pipeline material; pipeline design; population density; the existence and reliability of pipeline asset and testing records; pipeline leakage and other incident history; and subject matter expert knowledge.

3. **Project Description**

BHGD-NE has identified one specific bare steel distribution main replacement project scheduled to be completed in 2017. Typically for distribution line replacement projects, polyethylene pipe is used for both the distribution mains and associated service lines unless the system is required to operate above 100 pounds per square inch gauge (“psig”). If the system is required to operate above 100 psig, then steel pipe with fusion bonded epoxy coating is utilized. The total capital expenditure for this SSIR Project in 2017 is estimated to be \$72,963.

4. **Specific Projects**

a) **Axtell, Nebraska – Bare Main Replacement – Block 16, 17 and 18**

This SSIR project will consist of replacing three blocks of two-inch bare steel main with approximately 1,100 feet of two-inch polyethylene (“PE”) 2406 pipe in blocks 16, 17 and 18 of Axtell, NE. It will also involve the replacement of 17 service lines, each averaging 50 to 100 feet in length with one-inch PE pipe. The existing main requires a rectifier installation to maintain compliant cathodic readings. Even with rectifiers on the system the bare main in this area is affecting readings on the extremities of this portion of the Axtell distribution. The pipe to soil readings on this old segment of main fluctuate with soil conditions but, at times, fall down to near the minimum acceptable level of -0.850 millivolts. The 17 meters are currently set at the alley and will be moved adjacent to the house wherever possible to protect them from outside force or third-party damage. The estimated total capital cost of this SSIR Project is \$72,963. The anticipated in-service date is October 31, 2017.

B. Replacement of Transmission Pipeline

1. Background

BHGD-NE operates approximately 1,207 miles of transmission system in Nebraska, of which up to 412 miles are believed to have been installed prior to 1960 and certain segments are believed to have been installed as early as the 1930s. Although age alone does not determine the integrity of a pipeline system, some older pipeline facilities that are constructed of certain materials and with certain coatings may have degraded over time. Even though these transmission lines are cathodically protected, it becomes increasingly difficult to maintain effective corrosion protection because of the age of the system. Based upon known data, including installation records and construction methods, leakage history, cathodic protection data, damage history and population density, BHGD-NE's TIMP identifies transmission pipeline segments that are higher risk.

2. SSIR Project Classification

a) Classification Under SSIR Tariff

BHGD-NE identified transmission pipeline segments displaying safety threats requiring remediation under CFR Title 49, Part 192, Subpart O, TIMP. Section 192.917 requires a pipeline operator to evaluate and remediate pipeline segments where corrosion has been identified that could adversely affect the integrity of the line.

b) Objective Criteria Analyzed

The other objective criteria that BHGD-NE analyzed for this Project are: corrosion control analysis; pipeline material; pipeline configuration and segmentation; pipeline piggability; pipeline leakage and other incident history; subject matter expert knowledge; Project timeframe; weather and climate constraints on the construction season; permitting constraints; service outage management; and pipeline source of supply and availability of alternate gas supply.

3. Project Description

BHGD-NE has identified one specific transmission replacement project scheduled to be completed in 2017. The total capital expenditure for this SSIR Project is estimated to be \$516,191.

4. **Specific Project**

a) **Alliance, Nebraska – Northport to Lewellen Mainline Replacement**

This SSIR Project involves the replacement of approximately 10,140 feet of three-inch pipe that supplies natural gas to the towns of Oshkosh and Lewellen, NE, and rural agriculture customers in that area. This pipe was installed in 1966 and is very shallow. In addition, the coating is becoming disbonded which makes maintaining compliant cathodic readings extremely difficult. BHGD-NE intends to replace this pipe with new Grade X-52, three-inch pipe, which will be buried underground. Due to the relatively short length of this replacement it was decided to replace in kind rather than the industry standard practice of replacing three-inch pipe with four-inch pipe. Replacing this TOG pipe is in the best interest of public safety. The total estimated capital cost of this SSIR Project is \$516,191. The SSIR Project has a scheduled in-service date of July 31, 2017.

C. **Barricades**

1. **Background**

These SSIR Projects involve the installation of barricades to protect meter, regulator and valve settings from outside force damage. This threat is largely caused by meter loops being at the customer's property line, in an alley or adjacent to the street. In addition, the widening of streets and highways, increased utilization of agricultural land, and increased traffic from both mechanized farm equipment and motor vehicles have rendered many meters more vulnerable to outside force damage. Often times, these meters are bumped by vehicles backing out of garages or hit alongside a street that result in a bent meter or leak to the meter loop. Alongside meter loops, regulator and valve sets also are susceptible to outside force damage both in city limits and rural areas. The occurrence of such damage has increased over the years, and Company records show that the greatest risk to its distribution system is outside force damage, much of which is a result of meters being hit by vehicles and farm equipment.

2. **SSIR Project Classification**

a) **Classification Under SSIR Tariff**

BHGD-NE identified these facilities requiring remediation under CFR Title 49, Part 192, Subpart P, DIMP. Section 192.1007 requires a pipeline

operator to identify threats, evaluate and risk rank, and identify and implement measures to address risks.

b) **Objective Criteria Analyzed**

Specific data and reporting mechanisms developed under BHGD-NE's DIMP clearly has indicated that outside force damage, particularly to above ground meters, is a frequent occurrence. In 2016, BHGD-NE experienced 163 instances of outside force damage to date to its distribution system in Nebraska, with 126 of these instances being related to hit meters. CFR Title 49, Part 192, Section 192.353 requires a pipeline operator to protect meters from corrosion and other damage, including, if installed outside a building, vehicular damage that may be anticipated.

3. **Project Description**

Barricades are structures typically fabricated from pipe material and resemble a fence or cage-like structure around the meter. For most meter applications, BHGD-NE installs prefabricated meter barricades manufactured with two-inch pipe. Larger meters, regulator stations or valve settings may require custom fabrication to properly fit and protect the asset. The locations requiring the installation of a barricade are determined by field personnel working in conjunction with the Company's integrity management members to determine which facilities are at high risk. Factors in this determination include, but are not limited to, previous damage history, proximity to roadways, field observations and system operating pressures. BHGD-NE plans to install approximately 98 barricades in 2017. The total capital expenditure for barricade installations in 2017 is estimated to be \$91,260. All barricade SSIR Projects listed are expected to be completed by December 31, 2017.

4. **Specific Projects**

- a) **Holdrege** – \$33,750
- b) **Kearney** – \$17,010
- c) **Albion** – \$40,500

D. Cathodic Protection and Corrosion Prevention

1. Background

Cathodic protection infrastructure is to be applied to all steel pipelines according to PHMSA regulations published in 49 CFR Section 192.451. BHGD-NE meets this requirement by utilizing galvanic anode applications as well as Impressed Current Cathodic Protection. Cathodic protection is an electrochemical process used to protect steel structures in contact with soil. The soil is the electrolyte portion of the corrosion cell with the pipeline as the cathode of the electrical circuit. The intent in the application of cathodic protection is to convert the oxygen in the soil to a hydroxyl ion thus causing the environment surrounding the pipeline to become more alkaline. Steel tends to passivate in alkaline environments which result in very low corrosion rates. Magnesium anodes are installed in situations where a small amount of electrical current is needed to achieve adequate cathodic protection levels. Cathodic protection rectifiers with graphite anodes, as an Impressed Current Cathodic Protection system, are installed when a larger amount of electrical current is needed to achieve adequate cathodic protection levels. BHGD-NE's steel pipeline system varies from bare Top of Ground ("TOG") to buried lines with various types of coatings in a variety of conditions. The electrical current requirement for each type of installation, whether bare or coated, covers a wide range. The cathodic protection levels are measured periodically as required along the pipeline. The periodic surveys will readily indicate deficiencies in the cathodic protection system. These deficiencies can be indicative of active corrosion, dis-bonded coating, anode degradation or shorted pipeline casings.

2. SSIR Project Classification

a) Classification Under SSIR Tariff

Projects requiring cathodic protection remediation under CFR Title 49, Part 192, may be subject to either Subpart O (TIMP) or Subpart P (DIMP) depending on whether the pipe segment is classified as transmission or distribution pipe. For transmission segments, Section 192.917 requires a pipeline operator to evaluate and remediate pipeline segments where corrosion has been identified that could adversely affect the integrity of the line. Remediation of distribution segments is specified in Section 192.1007, which requires a pipeline operator to identify threats, evaluate and risk rank, and identify and implement measures to address risks.

b) **Objective Criteria Analyzed**

In addition to Sections 192.917 and 192.1007, BHGD-NE analyzed these SSIR Projects in accordance with the regulatory requirements in Section 192.463, which requires operators to maintain a level of effective cathodic protection and Section 192.467, which requires that each pipeline must be electrically isolated from metallic casings.

The other objective criteria that BHGD-NE analyzed for these SSIR Projects are: corrosion control analysis; pipeline vintage; pipeline material; the existence and reliability of pipeline asset and testing records; pipeline leakage and other incident history; subject matter expert knowledge; and Project timeframe.

3. **Project Description**

Four cathodic protection SSIR Projects have been identified by BHGD-NE that require the replacement or installation of anode ground beds or rectifiers.

The total capital expenditure for these four SSIR Projects in 2017 is estimated to be \$49,886. All three cathodic protection SSIR Projects are expected to be completed by October 31, 2017.

4. **Specific Projects**

a) **Holdrege, Nebraska – Install One Rectifier and One Anode Bed at Two Locations Within the Holdrege Division**

Cathodic protection surveys taken in 2016 have indicated that the natural gas distribution systems designated as line segments 270-0500 (anode bed) and 220-2260 (rectifier) have currently fallen below or are at risk of falling below cathodic protection compliance levels within the next 12-months. Black Hills Energy's corrosion technicians have determined that one rectifier and one anode ground bed is needed to correct and maintain these systems. This SSIR Project is scheduled to be in service by October 31, 2017, at an estimated capital cost of \$20,531.

b) **Kearney, Nebraska – Install Anode Beds at Six Locations Throughout the Kearney Division**

Cathodic protection surveys taken in 2016 have indicated that the natural gas distribution systems designated as line segments 220-2459 (2 locations), 240-2534, 240-8001, 240-2209 and 240-9025 (Pleasanton

distribution system) have currently fallen below or are at risk of falling below cathodic protection compliance levels within the next 12-months. Black Hills Energy’s corrosion technicians have determined that six anode ground beds and one rectifier are needed to correct and maintain these systems. This SSIR Project is scheduled to be in service by October 31, 2017, at an estimated capital cost of \$9,785.

c) **Scottsbluff, Nebraska – Install Anode Beds at Two Locations Within the Scottsbluff Division**

Cathodic protection surveys taken in 2016 have indicated that the natural gas distribution system designated as line segment 60-9050 has currently fallen below or is at risk of falling below cathodic protection compliance levels within the next 12 months. Black Hills Energy’s corrosion technicians have determined that two anode ground beds on this line segment are needed to correct and maintain this system. This SSIR Project is scheduled to be in service by October 31, 2017, at an estimated capital cost of \$3,262.

d) **Sutton, Nebraska – Install Anode Beds at Ten locations Throughout the Sutton Division**

Cathodic protection surveys taken in 2016 have indicated that the natural gas distribution systems designated as line segments 500-0340, 460-1757, 460-2150 (2 locations), 460-1805, 400-1973, 460-2264, 460-2337, 390-2350 and 500-1520 have currently fallen below or are at risk of falling below cathodic protection compliance levels within the next 12 months. Black Hills Energy’s corrosion technicians have determined that ten anode ground beds are needed to correct and maintain these systems. This SSIR Project is scheduled to be in service by October 31, 2017, at an estimated capital cost of \$16,308.

E. **Town Border Stations (“TBS”)**

1. **Background**

Many TBS facilities in service today were built in the 1950s-1960s era, well before the requirements of 49 CFR 192 existed. Although many of these stations have provided service for well over 50 years, they may not have been built in accordance with today’s standards. Many TBS facilities have outdated equipment including shop fabricated heaters that are inefficient, weighted lever reliefs, and excessive pressure drop regulators. Because of their age, many station components are displaying corrosion concerns on the piping and other

components. In some cases, the TBS equipment and piping is still adequate but the existing line heater is inefficient, undersized and/or corroding and needs to be replaced. Through a multi-year program, BHGD-NE plans to replace these aging stations and/or line heaters with components built to today's standards.

2. **SSIR Project Classification**

a) **Classification Under SSIR Tariff**

BHGD-NE identified pipeline system components displaying safety threats requiring remediation under CFR Title 49, Part 192, Subpart O, TIMP. Section 192.917 requires a pipeline operator to evaluate and remediate pipeline segments where corrosion has been identified that could adversely affect the integrity of the system.

b) **Objective Criteria Analyzed**

In addition to Sections 192.917, BHGD-NE analyzed this SSIR Project in accordance with the regulatory requirements in Section 192.479, which requires operators to maintain coatings and corrosion control on pipe segments exposed to the atmosphere, and Section 192.739, which requires operators to maintain pressure limiting and regulator stations in good mechanical condition.

The other objective criteria that BHGD-NE analyzed for this SSIR Project are: corrosion control analysis; vintage; material; the existence and reliability of pipeline asset and testing records; subject matter expert knowledge; and Project timeframe.

3. **Project Description**

Through a multi-year program, BHGD-NE plans to replace these aging stations and/or line heaters with components built to today's standards. The new stations will be built with new components including regulators, pressure relief and isolation valves, line heaters and coated or painted new piping. For 2017, BHGD-NE has identified and scheduled for the replacement of one TBS at a total estimated capital cost of \$208,270. This Project is expected to be completed by November 30, 2017.

4. **Specific Projects**

a) **Gordon, Nebraska – TBS Relocation & Replacement**

This SSIR Project includes the relocation and replacement of the Gordon TBS in an effort to bring the TBS up to current code requirements and to improve the safety and reliability of the facility. The current site is adjacent to U.S. Highway 20 and has been damaged by a motor vehicle in the past. The existing TBS has an open flame line heater without proper safety controls, gas carrier pipe that is used as piping support resting on concrete which is a corrosion concern, valves that are in poor condition, and pressure regulating equipment that needs updating. The new TBS will include a much safer manufactured water bath line heater, proper pipe supports, standby alternate path to avoid system outage, new valves, and new pressure regulating equipment. The total capital cost of this SSIR Project is estimated at \$208,270, with a scheduled in-service date of November 30, 2017.

F. **Top of Ground (TOG) Replacement**

1. **Background**

Natural gas pipelines installed today generally are below grade with a minimum cover of three feet. Burying pipelines reduces the overall risk of the pipeline from outside force among other threats. Many pipeline segments operated by BHGD-NE in Nebraska, however, were installed by the Company's predecessor during the 1950s and 1960s on top of the ground. These lines today are referred to as "Top of Ground" (TOG) within the BHGD-NE system. During the time these lines were installed, the Company's predecessor made a push to serve agricultural customers and small communities, and installing TOG lines expedited service to these areas and reduced installation costs. When originally installed, most line segments were laid along fence lines, section lines or other rights-of-way that did not pose a high level of risk because they were visible and known to farmers. Through time, however, property owners and lease tenants have changed, many fences have been removed, agricultural land has been developed and, in places, the TOG segments have become partially buried. These TOG segments are susceptible to outside force damage as well as corrosion threats.

2. **SSIR Project Classification**

a) **Classification Under SSIR Tariff**

TOG Projects identified are covered under CFR Title 49, Part 192, and may be subject to either Subpart O (TIMP) or Subpart P (DIMP) depending on whether the pipe segment is classified as transmission or distribution pipe. For transmission segments, Section 192.917 requires a pipeline operator to evaluate and remediate threats to pipeline segments including where corrosion has been identified or potential outside force damage could occur that could adversely affect the integrity of the line. Remediation of distribution segments is specified in Section 192.1007, which requires a pipeline operator to identify threats, evaluate and risk rank, and identify and implement measures to address risks.

b) **Objective Criteria Analyzed**

In addition to Sections 192.917 and 192.1007, BHGD-NE analyzed these SSIR Projects in accordance with the regulatory requirements in Section 192.479, which requires operators to maintain coatings and corrosion control on pipe segments exposed to the atmosphere.

The other objective criteria that BHGD-NE analyzed for the TOG SSIR Projects are: corrosion control analysis; pipeline vintage; pipeline material; the existence and reliability of pipeline asset and testing records; pipeline leakage and other incident history; subject matter expert knowledge; and Project timeframe.

3. **Project Description**

BHGD-NE has identified four SSIR Projects to replace TOG pipeline segments. For distribution lines, the TOG steel pipeline segments typically are replaced with polyethylene pipe. Line segments that are required to operate at a higher pressure, in excess of 100 PSIG, typically are replaced with steel pipe coated with fusion bonded epoxy. The total capital expenditure for these four SSIR Projects in 2017 is estimated to be \$9,351,871. For these four projects, no pipe sizing changes were made other than to replace the non-standard one and one-quarter inch pipe with two-inch steel pipe. Because current steel pipe costs for two-inch pipe is less than one and one-quarter inch pipe, no betterment allowances were made for these four projects. All four TOG SSIR Projects are expected to be completed by December 31, 2017.

4. **Specific Projects**

a) **Kearney, Nebraska – TOG Replacement 370-0060**

This SSIR Project will involve the replacement of approximately 35,100 feet of one and one-quarter inch pipe and approximately 30,080 feet of two-inch pipe all of which is TOG. This project is south of Axtell, NE. Most of this pipe is 1950s and 1960s vintage that has no coating and it lies directly on the ground where it is subject to damage from outside forces such as agricultural equipment, vehicles and adverse weather. BHGD-NE intends to replace this pipe with new Grade X-52, two-inch pipe, which will be buried underground. Replacing this TOG pipe is in the best interest of public safety. The total estimated capital cost of this SSIR Project is \$2,516,553. The SSIR Project has a scheduled in-service date of August 31, 2017.

b) **Holdrege, Nebraska – TOG Replacement 250-1856**

This SSIR Project will involve the replacement of approximately 26,930 feet of one and one quarter-inch pipe and approximately 61,460 feet of two-inch pipe all of which is TOG. This line is located south of Bertrand, NE. Most of this pipe is 1950s and 1960s vintage that has no coating and it lies directly on the ground where it is subject to damage from outside forces such as agricultural equipment, vehicles and adverse weather. BHGD-NE intends to replace this pipe with new Grade X-52, two-inch pipe and with two-inch Polyethylene, which will be buried underground. Replacing this TOG pipe is in the best interest of public safety. The total estimated capital cost of this SSIR Project is \$2,546,429. The SSIR Project has a scheduled in-service date of December 31, 2017.

c) **Sutton, Nebraska – TOG Replacement 390-1653**

This SSIR Project will involve the replacement of approximately 2,740 feet of one and one quarter-inch pipe and approximately 66,230 feet of two-inch pipe all of which is TOG pipe. This line is northwest of Giltner, NE. Most of this pipe is 1950s and 1960s vintage that has no coating and it lies directly on the ground where it is subject to damage from outside forces such as agricultural equipment, vehicles and adverse weather. BHGD-NE intends to replace this pipe with new Grade X-52, two-inch pipe, which will be buried underground. Replacing this TOG pipe is in the best interest of public safety. The total estimated capital cost of this

SSIR Project is \$2,637,483. The SSIR Project has a scheduled in-service date of August 31, 2017.

d) **Sutton, Nebraska – TOG Replacement 390-0180**

This SSIR Project will involve the replacement of approximately 3,830 feet of one and one quarter-inch pipe and approximately 39,180 feet of two-inch pipe all of which is TOG pipe. This line is northwest of Utica, NE. Most of this pipe is 1950s and 1960s vintage that has no coating and it lies directly on the ground where it is subject to damage from outside forces such as agricultural equipment, vehicles and adverse weather. BHGD-NE intends to replace this pipe with new Grade X-52, two-inch pipe, which will be buried underground. Replacing this TOG pipe is in the best interest of public safety. The total estimated capital cost of this SSIR Project is \$1,651,406. The SSIR Project has a scheduled in-service date of October 31, 2017.

G. **Meter Relocations**

1. **Background**

These four SSIR Projects involve the relocation of meter loops from their current location near a highway, street or alley to the structure to better protect them from outside force damage. This threat is largely caused by meter loops being at the customer's property line, in an alley or adjacent to the street. Often times, these meters are bumped by vehicles backing out of garages or hit alongside a street that result in a bent meter or leak to the meter loop. The occurrence of such damage has increased over the years, and Company records show that the greatest risk to its distribution system is outside force, much of which is a result of meters being hit by vehicles.

2. **SSIR Project Classification**

a) **Classification Under SSIR Tariff**

BHGD-NE identified these facilities requiring remediation under CFR Title 49, Part 192, Subpart P, DIMP. Section 192.1007 requires a pipeline operator to identify threats, evaluate and risk rank, and identify and implement measures to address risks.

b) Objective Criteria Analyzed

BHGD-NE analyzed these SSIR Projects in accordance with the regulatory requirements in Section 192.1007, as discussed above. BHGD-NE also analyzed these SSIR Projects in accordance with Section 192.353 which requires a pipeline operator to protect meters from corrosion and other damage, including, if installed outside a building, vehicular damage that may be anticipated.

The other objective criterion that BHGD-NE analyzed for these SSIR Projects is: threat assessment.

3. Project Description

Meter loops are typically relocated from the vulnerable location to the structure to better protect them from outside force damage. In some cases, the service lines are replaced due to age, pipe material or condition of the pipe. The decision to relocate meters is determined by field personnel working in conjunction with the Company's integrity management members to determine which facilities are at high risk. Factors in this determination include, but are not limited to, previous damage history, proximity to roadways, field observations and system operating pressures. BHGD-NE plans to relocate 85 meters in 2017. The total capital expenditure for meter relocations in 2017 is estimated to be \$387,604. All meter relocation SSIR Projects listed are expected to be completed by September 30, 2017.

4. Specific Projects

a) Bloomfield, Nebraska – Meter Relocation

The Bloomfield Meter Relocation project will relocate 15 meters away from highway 84, which runs through town, and move the meters next to the structures. When the meters were originally installed, they were placed at the road. Given the highway's current width, the meters are at risk of being hit or damaged by vehicles. Hit meters are the number one cause for outside force damages in this BHGD-NE area. Removing these 15 meters from high traffic roads will help reduce the risk of hit meters occurrences. The total capital cost of this SSIR Project is estimated at \$60,161, and is scheduled to be in service by September 30, 2017.

b) **Crofton, Nebraska – Meter Relocation**

The Crofton Meter Relocation project will relocate 21 meters away from highway 12, which runs through Crofton, and move the meters next to the structures. When the meters were originally installed, they were placed at the road. Given the highway's current width, the meters are at risk of being hit or damaged by vehicles. Hit meters are the number one cause for outside force damages in this BHGD-NE division. In addition, these meters are corroding due to the road department salt being splashed on them during winter. Removing these 21 meters from high traffic roads will help reduce the risk of hit meters occurrences. The total capital cost of this SSIR Project is estimated at \$83,850, and is scheduled to be in service by September 30, 2017.

c) **Wausa, Nebraska – Meter Relocation**

The Wausa Meter Relocation project will relocate 4 meters away from highway 121, which runs through Wausa, and move the meters next to the structures. When the meters were originally installed, they were placed at the road. Given the highway's current width and the current location of BHGD-NE meters, the meters are at risk of being hit or damaged by vehicles. Hit meters are the number one cause for outside force damages in this BHGD-NE division. Removing these 4 meters from high traffic roads will help reduce the risk of hit meters occurrences. The total capital cost of this SSIR Project is estimated at \$26,243, and is scheduled to be in service by September 30, 2017.

d) **Alliance, Nebraska – Meter Relocation**

BHGD-NE will move 45 meters that are presently in a narrow alley, in blocks 106 and 107, in Alliance, Nebraska. The meters will be moved next to the structures that the meters serve, which will substantially reduce the probability that these meters will be struck by vehicles. Both the original mains and services were installed in 1954. This is a continuation of the projects that were completed in 2015 and 2016. The total capital cost of this SSIR Project is estimated at \$217,350, and is scheduled to be in service by September 30, 2017.

H. PVC Pipe Replacement

1. Background

BHGD-NE currently operates approximately 846 miles of polyvinylchloride (“PVC”) distribution pipelines in Nebraska which were installed between the mid-1960s through 1980. By the mid-1980’s PVC was no longer a recommended piping material due to the evolution of superior piping materials, such as PE pipe, and new construction methods. There are several safety issues with PVC pipe that the Company, and the industry as a whole, face. For example PVC pipe has a high instance of leaks at joints due to adhesive failure. Additionally, in many instances the integrity of older PVC pipe is compromised because the material becomes brittle over time, which makes PVC pipe more prone to failure due to stress intensification that occurs when soil around a pressurized pipe is removed. Also, PVC pipe was installed with tracer wire to assist in locating the pipe, and over time that tracer wire has corroded and no longer carries a current. This makes it difficult for the Company to provide accurate pipe location points, which significantly increases the risk of third party damage.

In 2015, as a result of the safety risks associated with PVC pipe that are described above, the Company determined a need to develop a multi-year program to replace this pipe with PE pipe. In 2016, the initial year of this program, the Company replaced two town distribution systems, one rural distribution system and two rural projects. As continuation of this program in 2017, BHGD-NE proposes to replace two rural gas systems.

2. SSIR Project Classification

a) Classification Under SSIR Tariff

BHGD-NE identified PVC pipeline segments requiring replacement under CFR Title 49, Part 192, Subpart P (DIMP). Section 192.1007 requires a pipeline operator to identify threats, evaluate and risk rank, and identify and implement measures to address risks.

b) Objective Criteria Analyzed

In addition to Section 192.1007, BHGD-NE analyzed these SSIR Projects in accordance with the regulatory requirements in Section 192.281, as well as the National Fuel Gas Code ANSI Z223/NFPA 54, 5.6.4.1.3. Both codes provide guidance for repairing PVC natural gas pipelines, and both codes recommend against installing PVC pipe for installation of new

pressurized natural gas pipelines. BHGD-NE also analyzed these Projects in accordance with the regulatory requirements in Section 192.321(e), which requires pipe to be locatable.

The other objective criteria that BHGD-NE analyzed for these SSIR Projects are: pipeline vintage, pipeline material, the existence and reliability of pipeline asset and testing records, pipeline leakage and other incident history; subject matter expert knowledge; and Project timeframe.

3. **Project Description**

BHGD-NE has identified two specific PVC distribution main pipelines that will be replaced with PE pipe in 2017. The total capital expenditure for these two SSIR Projects in 2017 is estimated to be \$1,131,620. Both of these PVC SSIR Projects are expected to be completed by September 30, 2017.

4. **Specific Projects**

a) **Holdrege, Nebraska PVC 220-2260 – PVC Main Replacement**

This SSIR Project involves the replacement of approximately 13,660 feet of two-inch PVC main with approximately 13,660 feet of two-inch PE main in the rural gas distribution system. This pipe is located approximately four miles west of Bertrand, NE and was installed in June of 1980. Due to deterioration of the tracer wire, the inability to accurately locate the PVC mains increases the probability of damage due to third party construction activities. In addition, eleven leaks have been detected on this pipe segment. The total estimated capital cost of this SSIR Project is \$243,352. The SSIR Project has a scheduled in-service date of September 30, 2017.

b) **Sutton, Nebraska PVC 460-2507 – PVC Main Replacement**

This SSIR Project involves the replacement of approximately 50,300 feet of two-inch PVC main with approximately 50,300 feet of two-inch PE main in the rural gas distribution system. This pipe is located approximately two miles south of Exeter, NE and was installed in July of 1967. Due to deterioration of the tracer wire the inability to accurately locate the PVC mains increases the probability of damage due to third party construction activities. In addition, five leaks have been detected on this pipe segment. The total estimated capital cost of this SSIR Project is

\$888,268. The SSIR Project has a scheduled in-service date of August 31, 2017.

I. Facility Relocation Projects

The SSIR Tariff authorizes the Company to recover the costs of facility relocation projects in the SSIR Charge. The Company each year encounters the need to conduct facility relocation projects in connection with municipal infrastructure projects. These facility relocation projects, when they occur, are directly related to pipeline safety and integrity activities. Such projects are an integral step in the overall safety and integrity process. These projects are required by government entities to enhance the public welfare, including safety.

Although the Company is currently unaware of any state or municipal infrastructure projects in 2017 that may require the Company to conduct facility relocation projects, the costs of which are Eligible System Safety and Integrity Costs for recovery through the SSIR Tariff, the possibility of a qualified project could arise. See Project No. 21 (Nebraska Highway Relocation Program) on Exhibit 4, Table 3, Page 6 of 6 to this application, which shows that no dollars associated with 2017 facility relocation projects are being sought for recovery through this filing. Therefore, as part of its quarterly surveillance reports, the Company will provide updates of its facility relocation projects in connection with state or municipal infrastructure projects and, through its October 1, 2018 annual filing, will seek to recover the Eligible System Safety and Integrity Costs associated with those projects.