Before the Public Service Commission

NIAGARA MOHAWK POWER CORPORATION
d/b/a NATIONAL GRID

Rebuttal Testimony

of

Gas Infrastructure and Operations Panel

Dated: December 16, 2020

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I. Introduction

Q. Please identify the members of the Gas Infrastructure and Operations Panel.

A. The Gas Infrastructure and Operations Panel (the "Panel") consists of Ross W. Turrini, Timothy S. Graham, Caroline Hon, and Tatiana Roc.

Q. Is this the same Panel that previously submitted direct and corrections and updates testimony on behalf of Niagara Mohawk Power Corporation d/b/a National Grid ("Niagara Mohawk" or the "Company") in these proceedings?

A. Yes. The terms defined in our direct and corrections and updates testimony have the same meanings here.

Q. What is the purpose of the Panel's rebuttal testimony?

A. The purpose of the Panel's rebuttal testimony is to respond to certain recommendations set forth in the prepared testimony of the Department of Public Service Staff ("Staff") Gas Infrastructure and Operations Panel ("SGIOP"), the Staff Pipeline Safety Panel ("SPSP"), the Staff Gas Reliability Panel ("SGRP"), the Staff Revenue Requirements Panel ("SRRP"), the Staff Security Panel ("SSP"), and the Staff Efficiency and Sustainability Panel ("SESP"), as well as Citizens Action of New York ("CANY"), Sierra Club and Natural Resources Defense Council Witness Ezra D. Hausman ("Sierra Club"), Environmental Defense Fund's Witness Joseph Von Fischer ("EDF"), and Stop New York Fracked Gas Pipeline ("SNYFGP").

Regarding recommendations and proposed adjustments to the Company' forecast incremental gas capital and operations and maintenance ("O&M") expenditures, the Panel's rebuttal testimony will address:

- Staff's and other parties' proposed adjustments to the Company's Mandated, Reliability, Customer Connections, and Non-Infrastructure capital categories, including the Albany Loop Project;
- Staff's proposed adjustments to the Company' O&M programs and incremental FTEs; and
- Other recommendations by Staff and other parties regarding non-pipes alternatives ("NPAs"), transportation and information technology ("IT") costs, updates to reflect the Commission's recent AMI Order in the 2017 Rate Case, and capital reporting.

The Company' Gas Safety Panel addresses the SGIOP's recommendations and proposed adjustments to the gas safety metrics and several gas safety programs proposed by the Company.

Q. Does the Panel sponsor any exhibits as part of its rebuttal testimony?

A. Yes. The Panel sponsors the following exhibits that were prepared under its direction and supervision:

Exhibit __ (GIOP-1R): Actual and Projected Direct Capital Expenditures: Historic Test Year and April 1, 2020 – March 31, 2025 (FY 2021 – FY 2025)

Exhibit __ (GIOP-5R): Incremental O&M Non-Labor Expenditures: Rate Year, Data Year 1, and Data Year 2

Exhibit __ (GIOP-6R): Incremental Full Time Equivalent Positions by Function in the Rate Year, Data Year 1, and Data Year 2

Exhibit __ (GIOP-7R): Total Gas Capital Related Expenditures: FY 2021 – FY 2025

Exhibit __ (GIOP-11R): Relevant Information Request ("IR") responses

II. Capital Forecast Adjustments

Q. Please summarize the SGIOP's general approach and basis for proposed adjustments to the Company' capital forecasts.

A. The SGIOP generally supports the Company capital plans (SGIOP at 19) but proposes certain reductions to the Company's Customer Connections, Mandated, and Reliability categories. The SGIOP offers the following justifications for its proposed adjustments:

- The SGIOP found (at 17-19) that the Company's three-year average of actual capital spending in FY 2018, FY 2019, and FY 2020 was approximately four percent below budgeted amounts and that the Company had underspent its budget in certain capital spending categories during those three fiscal years.
- The SGIOP is concerned (at 19-20) about the Company's significant increases in capital spending, especially in light of its perception of the Company's actual-to-budget performance over the past three fiscal years in individual capital categories.
- Because of the timing of the Company' sanctioning process, sanction papers are generally not yet available for the Company's major investments. The SGIOP claims (at 16-17) that, without sanction papers, it is difficult to determine whether proposed projects are truly needed, whether forecasts are reasonable, whether

alternatives were considered, and whether the most appropriate project was selected.

Q. Has the Company provided adequate information to the SGIOP to enable a thorough review of the proposed capital investment plan?

A. Yes. The Company's direct testimony explains the capital budgeting planning and sanction processes including the timing of sanctioning that, as the SGIOP notes, occurs closer to the spending year. Although it is true that sanctioning documentations are not yet available for the Rate Year projects and programs, the Company's direct and corrections and updates testimony and exhibits provided extensive information for each program and project, including whitepapers (Exhibit __ (GIOP-4)) that contain the same information typically included in sanctioning documentation, such as detailed project descriptions, projects needs and justification, forecasting methodologies, cost drivers, applicable regulatory requirements, and alternatives analyses. The Company also responded to extensive discovery in this proceeding regarding the details of the capital plan and the projects and programs proposed.

Q. Does the Panel agree with the SGIOP's methods and justifications for its proposed adjustments?

A. No, for several reasons. The SGIOP proposes high-level adjustments that have been selectively applied to certain programs and projects within the capital spending categories that are not supported by sufficient data and analysis. For example, the SGIOP's blanket adjustments based on historic spending (FYs 2018-2020) do not consider the actual

projects contained in the Company's workplan or account for new projects and programs proposed by the Company that did not have a spend in those years.

Further, the SGIOP's focus on actual-to-budget variances in individual capital categories fails to recognize that the Company manages its capital spend across the entire portfolio, not just individual categories or projects. The Joint Proposal adopted by the Commission in Case 17-G-0239 provides that "[n]otwithstanding the specified segment-level and program/project level spending amounts set forth in [the capital by category schedule] nothing in this Joint Proposal is intended to limit Niagara Mohawk's flexibility during the term of the Rate Plan to substitute, change, or modify its capital projects." The Company may add, escalate, defer, or remove a project in its capital portfolio depending on need. A variance in one individual spending category is not indicative of the Company's inability to deliver on its capital portfolio, but demonstrates that the Company adapted its portfolio to meet the evolving needs of its customers. As noted in the SGIOP's testimony, the overall variance was approximately four percent below the budgeted amounts, which is a relatively minor variance given the overall size of the capital portfolio and supports the Company's ability to deliver on the projects and programs proposed. In sum, Staff's proposed adjustments will impair the Company's ability to deliver high priority capital programs that are needed to meet important reliability, safety, and policy goals.

Q. Please describe how the Company determined its proposed capital forecasts.

A. In contrast to the SGIOP's blanket approach to its adjustments, the Company determined the appropriate basis and methodology for forecasting Rate Year and Data Year

investments on a program-by-program basis. Following a detailed analysis of each program, the Company determined for each program whether an average of historic costs or the Historic Test Year represented the best predictor of Rate Year costs. The Company also determined the projects for which a project estimate, rather than a forecast based solely on historic costs, was more appropriate. In this way, the Company carefully considered any potential anomalies prior to setting its forecasts for each program. The Company's methodologies for deriving program forecasts are provided in the Company's testimony and exhibits and in its responses to IRs DPS-985, DPS-986, DPS-987, and DPS-988.

Q. How will the SGIOP's proposals impact the Company's ability to provide safe and reliable service?

A. The SGIOP's proposed adjustments based on the Company's three-year average of historic costs will shift funding away from the Company's highest priority mandated, safety, and reliability programs.

The SGIOP's recommendations will also hinder the Company's ability to deliver on many of the Commission's important policy, environmental, and safety objectives. For example, proposed downward adjustments in the Mandated category will challenge the Company's ability to deliver on aggressive goals for LPP replacement, methane reduction, and programs and projects that are necessary to reduce overall system risks. Proposed adjustments in the Reliability category will compromise the Company's ability to replace aging facilities and equipment that are critical to system operations and to control the gas system. Although the Company appreciates the SGIOP's concerns for managing

increasing costs, the reality is that the SGIOP's proposed adjustments will result in the reprioritization of capital investments in a manner that fails to achieve the Company's and the Commission's goals. This is not the right result from a public policy or safety perspective.

The Panel discusses in more detail the impacts of Staff's and intervenors' recommendations and proposed adjustments to individual capital programs in the sections that follow. The Company's position on the SGIOP's removal of the PE Stamping Program is discussed in the rebuttal testimony of the Gas Safety Panel.

III. Proposed Adjustments to Customer Connections Programs

A. Customer Connections Category Adjustment

Q. Please explain the SGIOP's adjustments.

A. The SGIOP (at 20-23) applied a three-year average of expenditures in FY 2018, FY 2019, and FY 2020, plus a 3.6 percent rate of inflation for each additional year, to develop its unit cost and then applied that unit cost to the Company's forecast for all programs in this category, excluding the System Reinforcement program and projects, to develop its forecast for FY 2022 – FY 2025. The SGIOP notes that there are various factors that influence the total costs in this capital category (*e.g.*, location, weather, construction method, and quantity) and believes that use of a three-year average will "smooth anomalies that may be present in any one year." The SGIOP also recommends removing the PE Stamping line item in this category in its entirety. The SGIOP recommends total reductions of

approximately $15.4 million, $19.3 million, $8.8 million, and $8.2 million to the Customer Connections category in FY 2022, FY 2023, FY 2024, and FY 2025, respectively.

Q. Does the Company agree with the SGIOP's adjustments to the Customer Connections Program?

A. No. The Company believes that its Customer Connections programs forecast appropriately estimates program needs in the Rate Year and Data Years based on recent trends and known cost drivers for this program. The Company described its methodology for forecasting this capital category in response to IR DPS-985 and support for certain projects within this category was provided in the Company's whitepapers in Exhibit __ (GIOP-4). Specifically, in the Customer Connections whitepapers in Exhibit __ (GIOP-4), at pages 1-11, the Company described the customer connections and construction levels projected over the next several years, which are not accounted for in the SGIOP's adjustments. Reductions to this category may adversely affect the Company's ability to support these connections in contravention of its regulatory obligation to serve customers.

B. <u>System Reinforcement Projects</u>

Q. Please describe the SGIOP's adjustments to the System Reinforcement budget in the Customer Connections category.

A. The SGIOP reduced the Company's forecast for two System Reinforcement projects – Rexford and Altamont – from the levels updated in the Company's corrections and updates filing to the funding levels forecasted in the Company's direct testimony. The SGIOP's only basis for the reduction is that it believes the Company's corrections and updates

testimony "did not provide adequate justification for the increases it proposed[.]" (SGIOP at 23-24).

Q. Does the Company agree with the SGIOP's adjustments to these programs?

A. No. The Company provided ample support for these programs in its direct and corrections and updates testimony, as well as its response to IR DPS-1020. As stated in its corrections and updates testimony (at 5-7), the Company revised the estimates for these system reinforcement projects after submitting its direct testimony. The figures submitted in the Company's direct testimony were initial, conceptual estimates that presented a high-level projection of project spend based on information available at that time. Since submitting the direct testimony, the project life cycles have further matured through Company's capital budgeting process and the revised estimates are based upon more formal project development, design, engineering, and constructability factors specific to these individual projects. Attachment 2 to the response to IR DPS-1020 provided updated estimating documents for both projects that outlined the estimate description, scope of work, clarifications, assumptions, and other detailed items to support the revised estimates. The updated estimating documents, in connection with the whitepapers submitted in the Company's direct testimony and the justification for revisions to project spend provided in corrections and updates testimony, provide sufficient support for the Commission to fund both projects at the levels submitted in the Company's corrections and updates testimony.

IV. Proposed Adjustments to Mandated Programs

Q. Please explain the SGIOP's reduction to certain programs in the Mandated spending category.

A. Similar to its adjustment to the Customer Connections category, the SGIOP (at 24-28) applied a three-year average of expenditures for "routine programs" in this category in FY 2018, FY 2019, and FY 2020, plus a 3.6 percent rate of inflation for each additional year, and then applied the average to the Company's forecast for those programs. The programs specifically adjusted are as follows: Public Works Program (City/State Construction); Service Replacement (Reactive Non-Leaks); Service Replacement (Reactive Leaks); Main Replacement (Reactive); Valve Installation and Replacement Program; Meter Purchases; Meter Changes; and Corrosion Control Inspection and Remediation. The SGIOP again cited various factors that influence the total costs in this capital category and posited that use of a three-year average will "smooth anomalies that may be present in any one year." The SGIOP also recommends removing the PE Stamping and Operator Qualifications Testing Program line items in this category in their entirety. The SGIOP's total adjustments to these programs reduce the Company's capital request and result in total reductions in the Mandated category of $3.9 million, $6.0 million, $6.8 million, and $7.0 million in FY 2022, FY 2023, FY 2024, and FY 2025, respectively.

Q. Does the Company agree with the SGIOP's recommended adjustment?

A. No. The Company's forecast of Mandated programs appropriately estimates the needs of this capital category in the Rate Year and Data Years based on recent trends and known cost drivers for this program. The Company described its methodology for forecasting this

capital category in response to IR DPS-986 and support for certain projects within this category was provided in the Company's whitepapers in Exhibit __ (GIOP-4). In contrast, the SGIOP selectively applied a three-year historic average to eight of the 34 programs in this category, noting that these programs were "routine" and providing no additional explanation as to why the programs were selected. The SGIOP's methodology should be rejected – its adjustments to the projects and programs included in the category are unsupported and merely serve to decrease funding for Mandated programs, which the SGIOP acknowledges (at 24-25) are required to comply with the Company's regulatory obligations and rate plan commitments (*i.e.*, are non-discretionary).

The Company's position on the SGIOP's removal of the Operator Qualifications Testing Program is discussed in the rebuttal testimony of the Gas Safety Panel.

V. Proposed Adjustments to Reliability Programs

A. Reliability Category Adjustment

Q. What are the SGIOP's recommendations for the Reliability category?

A. The SGIOP applied a three-year average of expenditures in this category in FY 2018, FY 2019, and FY 2020, plus a 3.6 percent rate of inflation for each additional year, to develop its unit cost for this category. Instead of selecting or excluding certain projects, however, as it did with the Customer Connections and Mandated categories, the SGIOP generically applied that unit cost to all programs in the Reliability category to develop its forecast for FY 2022 – FY 2025. Similar to the other capital categories, the SGIOP believes these adjustments are necessary to "smooth anomalies that may be present in any one year." The

SGIOP also recommends removing the PE Stamping Program line item in this category in its entirety and certain capital costs for the Albany Loop Project in FY 2022 – FY 2025. (SGIOP at 28-31). In total, the SGIOP recommends reductions of approximately $8.3 million, $17.1 million, $34.4 million, and $82.1 million to the Reliability category in FY 2022, FY 2023, FY 2024, and FY 2025, respectively.

Q. Does the Company agree with the SGIOP's recommended adjustment?

A. No. As with the SGIOP's adjustments to other capital categories, these adjustments are unsupported and will hinder the Company' ability to deliver important programs that are needed for the continued provision of safe and reliable service. The Company believes that its forecast for the Reliability category appropriately estimates program needs in the Rate Year and Data Years based on recent trends and known cost drivers for this program. The Company described its methodology for forecasting this capital category in response to IR DPS-987 and support for certain projects within this category was provided in the Company's whitepapers in Exhibit __ (GIOP-4). The SGIOP applies a three-year average to purportedly "smooth anomalies" that may occur in any single year without reviewing, discussing, or objecting to any of the individual projects or programs within this category. The SGIOP also reduced the security improvements at gas regulator stations without discussing the modification, which is contradictory to the SSP's recommendation (at 11-12) that the program be approved without discussion of any modifications.

Forecasts for the various projects and programs within the Reliability category are based on different needs and forecasting methodologies. Historic spending trends are not necessarily

reflective of the Company's needs in the Rate Year and Data Years. For example, in the Heater Installation Program, heaters must be replaced as they reach the end of their useful lives, so that the program needs can vary significantly depending on the age of assets. Additionally, station refurbishments or replacements are risk-driven, and the work plan is in part dependent on the conditions of the assets as they continue to age and the Company's ability to secure long lead time equipment as well as design and construct major projects in phases that may stretch over several years. The Company considers these factors when setting future project and program budgets, whereas these relevant factors are wholly ignored by SGIOP's attempt to adjust an entire category of spending based on historic trends without sufficient analysis, support, or discussion.

Q. How would the proposed reductions impact the projects and programs in the Reliability Program?

A. Failure to properly fund these projects and programs will have a detrimental effect on these programs and the safety and reliability benefits they are intended to provide. The SGIOP does not oppose the programs in this category or question their benefits. Rather, the SGIOP has decided that the Company's forecasts, which were based on consideration of the unique factors that influence historic spending variances in each project and program and other relevant factors, are not in line with the Company's historic spend in this category without providing any further support and analysis. Without adequate funding for all projects and programs, the Company may be required to divert funding to higher priority projects and programs in this spending category, while other projects and programs may need to be deferred altogether, thereby increasing overall safety and reliability risk on the system.

Additionally, the SGIOP's proposed reduction fails to consider that forecasts in the Reliability spending category are higher in the Rate Year and Data Years compared to historic spending levels due to incremental work and new programs (*e.g.,* the Distribution Station Over Pressure Protection) that address the identified best practices as well as the SGIOP's recommendations in the wake of certain gas safety events, such as the Columbia Gas Merrimack Valley incident. The SGIOP's proposal jeopardizes the Company's ability to implement industry best practices and needed improvements to various programs and projects in the Reliability category.

B. Albany Loop Project

Q. Please describe the SGRP's recommendations for the Albany Loop Project.

A. The SGRP recommends that the Company be required to solicit NPA solutions for the Albany Loop Project to address the long-term demand and reliability needs of firm gas customers. The SGRP recommends that the Company issue the RFP within 90 days of a Commission order establishing rates in this proceeding and that the Company work with Staff and other parties to develop potential solution types. Based on the SGRP's recommendations, the SGIOP removed all capital costs associated with the project from FY 2022 and made other downward adjustments to the Company's capital forecast in FY 2023 – FY 2025. (SGIOP at 30; Exhibit __ (SGIOP-4), Page 2).

Q. Does the Company agree with Staff's recommendation?

A. The Company is amenable to soliciting NPA solutions to mitigate some of the potential issues the Albany Loop Project is intended to address.

The Company's corrections and updates forecast deferred the project to allow for further project evaluation, including evaluation of NPAs and other demand response options, in light of recently reduced supply forecasts. As demonstrated in the Company's response to IR DPS-754, however, the reduced supply forecasts are not projected indefinitely, and a design-hour shortfall is projected in the winter of 2027-2028.

Q. Do any intervening parties object to the Albany Loop Project?

A. Yes. CANY and SNYFGP submitted testimony opposing the project. CANY claims that the Company's justification for the project has been inconsistent, alleging that the Company has "shifted rationales" for the project's need between supply interruptions and vulnerability concerns. CANY also asserts that the Company should not complete the project until it experiences an actual supply loss. SNYFGP argues that the reduced demand and renewables negate the need for the project altogether.

Q. Please provide the Company's response to the positions of CANY and SNYFGP.

A. With respect to CANY's arguments, the Company has not "shifted rationales" regarding the project's justification. The project was originally and remains a reliability project to provide distribution system resiliency and contingency in the event of a system failure or shortfall. Reliability projects and programs, like the Albany Loop Project, are aimed at preventing a future negative event from occurring. It would be imprudent and contradictory to the Company's obligation to provide safe and reliable service to customers to wait until an adverse event has occurred to address known or potential issues. Further, although the project may have an ancillary benefit of increasing future gas supply in the

area, it is not a standalone supply project and, until system demand grows to the point that an additional supply need is identified, the Company would not pursue a project or contract required to add supply.

SNYFGP's arguments are similarly flawed. Current levels of demand reduction and renewable use may defer immediate need for the project but they will not completely obviate the need to address reliability issues. As noted above, while NPAs, demand response, and other renewables may help to lessen the impact of future shortfalls or failures on the system, these actions will not completely remove the risk of service loss to customers in the area.

VI. Proposed O&M Adjustments

A. FTE Adjustments

Q. Did Staff propose adjustments to incremental FTEs?

A. Yes, Staff proposed two adjustments. The first adjustment seeks to eliminate 33 of the Company's proposed incremental FTEs to support gas operations and gas safety programs. (SGIOP at 7-8). The second adjustment is a slippage adjustment that moves the start date for all incremental FTEs by 72 days. (SRRP at 41-47).

Q. Does the Company agree with these adjustments?

A. No. As further detailed below and in the rebuttal testimony of the Gas Safety Panel, the incremental FTEs are required to deliver the intended scope and benefits of the Company's gas programs. The Company provided extensive information justifying the need for these

incremental FTEs in IR DPS-990, including how the Company determined the timing of when the FTEs were needed. The Company has aligned the starting dates of these FTEs with the underlying incremental work as discussed in DPS-990. More than half of the FTEs requested for the Rate Year are linked to the delivery of gas safety programs. A delay or failure to hire the FTEs by the start of the Rate Year, or, in some cases, to on-board them in accordance with phased staffing plans, would compromise the Company's ability to deliver these important programs. Furthermore, in the Company's response to DPS-473 (December), the Company indicated that it has already filled eight positions for which SRRP has delayed the start date. Five of the positions already filled were forecast to start at the beginning of the Rate Year. Thus, SRRPs slippage adjustment removes Rate Year operating expenses for a position that is filled today.

Q. Did the SGIOP make any other adjustments to FTEs?

A. Yes. The SGIOP reduced the Company's requested incremental FTEs for certain gas safety programs – the Enhanced Inactive Accounts Program, the Voluntary Integrity Management Program, Corrosion Control, and the Enhanced Contractor Safety Inspections Program – based on recommendations made by the SPSP. The rebuttal testimony of the Gas Safety Panel discusses the Company's position on the SGIOP's removal of these FTEs.

i. <u>High Emitter Leak Repair FTEs</u>

Q. What are the SGIOP's recommendations regarding the Company's proposed High Emitter Methane Detection Program?

A. The SGIOP (at 44-45) supports the Company's proposed program, which will prioritize the repair of high emitting leaks; however, the SGIOP does not support the two incremental FTE positions requested by the Company. The SGIOP cites the Company's positive performance against the current leak backlog gas safety metric as obviating the need for these positions and claims the Company failed to support the projected 50 additional leaks per calendar year used to justify the incremental positions.

Q. Does the Company agree with the SGIOP's recommendation?

A. No. Past performance against the leak backlog metric is not necessarily indicative of future performance against the metric. While the Company strives to achieve its annual leak backlog targets, the leak backlog is fluid and various factors beyond the Company's control can contribute to additional leaks on the Company's system. Further, the High Emitter Methane Detection Program proposed by the Company will enhance the Company's leak detection efforts and the Company estimates that additional leaks will be discovered annually through this process, increasing the Company's backlog. The Company will need additional resources to address the incremental leaks discovered. The Company provided the analysis supporting the two incremental FTEs requested in its response to IR DPS-804. The SGIOP has provided no additional analysis to rebut the Company's calculation and relies solely on the Company's prior performance when making its recommendation.

Additionally, in the direct testimony of the Company's Gas Safety Panel, the Company proposed to eliminate the existing GSRS cost recovery mechanism and the PRA for incremental leak repairs based on the Company's request for two incremental FTEs for the

High Emitter Methane Detection Program. The SPSP proposes (at 25) not only to remove the incremental FTEs but also to discontinue the leak backlog PRA. The Company proposed removal of the PRA because it did not want to request FTEs to potentially aid it in achieving a PRA. Absent the request for incremental FTEs, the Company would have proposed to continue the PRA. Staff has removed the resources needed to repair the projected leaks as well as any incentive the Company may have to exceed its leak backlog targets. The Company does not agree to removal of both the FTEs and the PRA.

Q. Does EDF make any recommendations regarding the High Emitter Methane Detection Program?

A. Yes. EDF believes that prioritizing leak repairs will help the State meet its CLCPA and GHG emission reduction goals and advanced leak detection tools, such as the High Emitter Methane Detection Program, are the best way to reduce leaks. EDF also recommends strengthening the program through use of advanced leak detection equipment and comprehensive analytics. The Company agrees that leak prioritization is one way the Company can contribute to CLCPA objectives and will continue to work with EDF on the advancement and evaluation of leak detection technology.

ii. <u>Damage Prevention FTE</u>

Q. Please describe the SGIOP's adjustment to the incremental FTE to support the Enhanced Damage Prevention Program.

A. The SGIOP (at 45-47) supports the Company's proposed enhancements to the Damage Prevention program but does not support the Company's request for an incremental Damage

Prevention supervisor FTE. The SGIOP alleges that the Company did not explain how the incremental FTE requested would increase the percentage of one-call notifications visited to 25 percent. The SGIOP also claims that the total damages incurred in calendar years 2018 and 2019 were in line with the Company's five-year average of damages based on Staff's Pipeline Safety Performance Measures Report, filed on June 11, 2020.

Q. Does the Company agree with the SGIOP's adjustment?

A. No. The Company outlined the need for this incremental position in its response to IR DPS-824. As stated in the Company's response, the incremental FTE will not only manage the additional damage prevention advisors proposed as part of the program enhancements but will also visit high risk sites as part of its job responsibilities. Targeted oversight of the damage prevention advisors as well as additional field resources will allow the Company to better coordinate and increase its daily field visits to the riskiest one-call sites. The Company proposed the incremental FTE in this case to provide more oversight to the advisors, provide education to excavators and repeat offenders, and conduct damage investigations to decrease the number of damages to the Company's system, which, despite the SGIOP's assertion, is generally trending upwards despite the Company's efforts. The full complement of program enhancements and benefits proposed by the Company cannot be achieved without the incremental FTE.

iii. <u>Service Regulator Inspection FTEs</u>

Q. Please describe the SGIOP's proposed downward adjustment to Service Regulator Inspection FTEs.

A. The SGIOP (at 48-50) supports only seven of the 16 incremental FTEs requested by the Company for this program. The SGIOP does not believe that 16 FTEs are needed to ensure that regulators are inspected once every 20 years based on the SGIOP's reduced estimate of the time to complete a physical inspection. Specifically, the SGIOP believes a benchmark of 30 minutes per inspection is appropriate to forecast the program's need rather than the 65 minutes per inspection used by the Company. The SGIOP applied the reduced inspection time to the Company's estimate of inspections and average annual employee working hours to derive its recommendation of seven FTEs. The SGIOP also recommends that the Company modify its O&M procedures to codify the 20-year inspection requirement.

Q. Does the Company agree with the SGIOP's recommendation?

A. No. This is yet another example of the SGIOP supporting the benefits of a program without providing the necessary resources. The SGIOP's claim that the total inspection time, inclusive of travel time and other factors, should be approximately 30 minutes is belied by the Company's actual experience. The Company's benchmark of 65 minutes was based on the Company's actual experience performing these inspections in its service territory, which includes approximately 30-31 minutes of actual inspection time plus other factors such as travel time, overtime, and attempts where the Company was unable to complete the inspection. The SGIOP's failure to properly account for the additional factors in its benchmark would lead to program understaffing and prevent the Company from completing these inspections within the proposed 20-year cycle.

With respect to codifying the program in its O&M procedures, the Company does not believe it is appropriate to revise its procedures to include the 20-year requirement without receiving the appropriate resources. The Company proposed this program to expand the scope of its existing multi-meter inspection program and provide additional gas safety benefits to customers in response to recent industry events. Codifying the program without having the appropriate FTEs to complete the inspections in a timely manner would potentially subject the Company to an NRA under its gas safety compliance performance metric for failure to follow its procedures This is inappropriate and could potentially disincent the Company and other utilities from proposing enhanced gas safety programs for customer benefit in the future.

iv. <u>Smart Meter and Smart RMD FTEs</u>

Q. Please explain the SGIOP's adjustments to the Smart Meter and Smart RMD positions requested by the Company.

A. The SGIOP (at 50-51) only supports one of the four incremental FTEs requested by the Company to support the proposed Smart Meter and Smart RMD programs. The SGIOP's rationale for disallowing the three incremental position is that the Company allegedly failed to justify the need for additional analysts and field technicians to support the program.

Q. Does the Company agree with this adjustment?

A. No. The SGIOP's adjustment fails to acknowledge that the proposed Smart RMDs and Smart Meter Programs are entirely incremental to the Company's existing workplan and, as such, will require additional FTEs to manage the workload. Additional resources are

required to ensure the efficient delivery and ongoing support of these programs. An experienced customer meter services technician will be needed to appropriately respond to the incremental events and alarms that will result from the program. Contrary to the SGIOP's assertion, this FTE will not be limited to one facility, but will provide services across all operating regions. The meter data services analyst will verify installations of Smart RMDs and Smart Meters through device configuration management, ensure data interrogations align with the customer system, and verify/manage the integrity and reliability of the data being sent through the AMI network. The risks associated with monitoring and controlling gas safety events over a network requires a dedicated FTE and cannot be managed within existing staffing levels.

v. <u>Gas Technical Training Transformation FTEs</u>

Q. Does the SGIOP support the Company's request for incremental FTEs to support the technical training transformation?

A. The SGIOP supports ten of the twelve incremental requested FTEs. In support of its FTE reduction, the SGIOP challenges the number of working hours the Company projected for these FTEs, claiming that the hours are not aligned with the working hours projected by the Company for other incremental positions. The SGIOP used an estimate of 1,720 working hours, rather than the 1,600 hours used by the Company, to project the number of FTEs the SGIOP believes is required to support this program. (SGIOP at 51-52). Although not explicitly discussed, the SGIOP's revenue requirement provides funding for the four field evaluators in the Company's Learning & Development program to support this program.

Q. Does the Company agree with the SGIOP's adjustment?

A. No. The Company forecast the need for these twelve incremental field technician and mentor FTEs based on its estimate of 1,600 productive hours for equivalent customer meter services ("CMS") positions. The productive hours are specific to the CMS group that will fill these positions, which is slightly lower than the other incremental positions requested. To arrive at its productive time estimate, the Company started with an eight hour day and then subtracted time for lunch, breaks, travel time, and an additional hour to account for system issues, team discussions, and other issues. The Company then applied the estimated daily working hours to the available days per year to arrive at 1,600 productive hours.

vi. <u>Capital Investment Support FTEs</u>

Q. Does the SGIOP recommend adjustments to the incremental FTEs proposed to support the increased capital workload?

A. Yes. The SGIOP recommends (at 55) removing 8.5 of the 14 incremental FTEs, stating that because 10.5 of the 14 FTEs will be "dispersed across all National Grid Companies," a reduction of the FTEs to their allocated equivalent is appropriate.

Q. Does the Company agree with this adjustment?

A. The Company opposes removal of these positions. The SGIOP attempts to use the Company's response to IR DPS-990 to support its reduction; however, the Company inadvertently used "dispersed across all National Grid Companies" rather than "dispersed across NMPC's service territory" in Attachment 2. Notwithstanding, the Company's response in Attachment 2 indicates that the location of the proposed incremental employees

will be in Upstate New York and these FTEs were specifically requested to support increasing capital workload and portfolio growth in all operating regions in Upstate New York. Absent these incremental resources, the Company will not be able to develop and deliver the capital plan effectively in a feasible or sustainable manner.

The rebuttal testimony of the Revenue Requirements Panel discusses the adjustment made for a formula error for one of the Project Manager positions in this request.

B. Research and Development Costs

Q. Does the SGRP make any recommendations regarding the Company's Incremental Research and Development ("R&D") Program?

A. Yes. The SGRP (at 33-34) recommends removing approximately $1.22 million of non-labor O&M in the Rate Year. The SGRP's adjustment is premised on its belief that the programs the Company proposed to fund are identical or overlapping with programs already proposed for KEDNY and KEDLI and therefore the request is duplicative.

Q. Is the SGRP's position accurate?

A. No. The proposed programs are funded through allocation from specific operating companies but do not include overlapping costs. Where all three LDCs will benefit from an R&D initiative, each LDC will fund a portion of the initiative through an allocation. Where a focus area has benefit for only a select LDCs, that LDC will solely fund the initiative. The costs in the Company's response to IR DPS-242, Attachment 1 reflect allocations from Niagara Mohawk to the stated R&D focus areas. Similar cost allocations

have been made to both KEDLI and KEDNY for the same R&D focus areas where they will mutually benefit. Allocating the costs in this manner ensures that all LDCs will fund and receive the benefits of mutually beneficial R&D programs.

C. Other Operating Adjustments

Q. Does the SGIOP make any adjustments to Incremental O&M Related to Capital?

A. Yes. Although not discussed in SGIOP's or any other panel's testimony, Exhibit __ (SRRP-2), Schedule 7, Adj. 4(i)25-28 makes downward adjustments to non-labor O&M for four Company programs: IMP/IVP OpEx - IMP (PHMSA Rules), IMP/IVP OpEx - IVP (PHMSA Rules), Transmission Station Integrity Program, and Critical Infrastructure Security (Regulator Stations). As provided in Staff's response to IR NMPC-25, these adjustments were incorrectly included in the SRRP's Exhibit __ (SRRP-2) and therefore these projects should not have been removed from SRRP's revenue requirement.

Q. Does the Company have any additional O&M adjustments?

A. Yes. As explained in the response to IR DPS-827, the Company recently revised the forecast for its mandated IMP program, which lowered the program's O&M forecast. Due to timing issues, the Company was not able to incorporate this reduction into its corrections and updates filing. The reductions have been included in Exhibit __ (GIOP-5R) and the rebuttal testimony and exhibits of the Revenue Requirements Panel.

VII. Other Recommendations and Adjustments

A. Non-Pipes Alternatives

Q. Please describe the recommendations of the SGRP and SESP and other intervening parties regarding NPAs.

A. The SGRP and SESP recommend that the Company implement NPA processes and procedures to address constrained service areas and replace incremental infrastructure investments as part of this rate proceeding. The SGRP (at 22-23) further recommends that the Company work with interested parties to develop NPA solicitation processes to NPA solution providers. The Sierra Club recommends that the Company establish a framework to evaluate and incorporate NPAs, such as demand response, geothermal loops, and fuel switching calculators.

Q. Does the Company support evaluation and adoption of NPAs?

A. Yes. The Company is committed to advancing clean energy investments and believes that adoption of NPAs will help the advance State's energy and policy objectives. The Future of Heat Panel proposed various products, services, and investments, including investments in renewables and NPAs, as part of this rate filing. These proposals include energy efficiency, enhanced demand response, a fuel-switching calculator, and a Power to Gas Collaboration as well as investments in renewable natural gas ("RNG"), hydrogen production and use, carbon capture, and geothermal networks – all of which are targeted to reduce reliance on traditional gas infrastructure investments. Notwithstanding, the Company is cognizant that even more can be done to advance the State's energy goals and meet CLCPA requirements. As indicated in the Company's responses to IR DPS-768 and

PACE-50, the Company is presently working to develop NPA protocols to evaluate alternatives to traditional infrastructure investments.

B. Fleet Replacement Costs

Q. The Staff Accounting Panel (at 33) recommends a significant downward adjustment to the forecast number of vehicle replacements from the end of the Historic Test Year through the end of the Rate Year. Please discuss the potential impact of Staff's adjustment to the Company's gas operations.

A. As further discussed in the rebuttal testimony of the Company's Revenue Requirements Panel, the Company disagrees with Staff's proposed decrease in the forecast number of vehicle replaces between January 2020 and June 2022 from 1557 to 575 and the resulting decrease in forecast leasing costs. For gas operations, Staff's adjustments would only permit the Company to replace approximately 209 of 565 vehicles that will be at or beyond their useful life. The vehicles impacted are primarily crew trucks and vans, which are a critical part of the Company's operations, as they allow the Company to maintain and operate its facilities, support its various capital programs, and respond to emergencies. If the Company is unable to replace its aging fleet, it must continue to extend the useful life of its existing vehicles. Older vehicles often require more maintenance and repairs, which not only add costs but also lead to increased downtime and limited availability. It is important to replace vehicles in the appropriate timeframe to maintain crew productivity, avoid delays to planned work, and respond to emergencies in a timely manner. Further, new vehicles will incorporate advances in technology that increase fuel efficiencies and

improve performance. Therefore, the Company submits that the Commission should approve the Company's proposed replacement of its vehicles.

C. Information Technology ("IT") Costs

Q. The Staff Information Technology Panel recommends a 42 percent reduction to the Company's proposed core IT capital budget. How will such a significant reduction impact the Company's gas operations?

A. As discussed in more detail in the rebuttal testimony of the Company's IT Panel, the Company's core IT expenditures are necessary to support the day-to-day operations of the gas business. Staff's proposed 42 percent reduction to the forecast expenditures will seriously hinder the Company's ability to deliver key IT projects to ensure it can operate effectively and efficiently. In particular, core IT programs for the Gas Operations are required for much needed upgrades to the business applications used on a daily basis to carry out essential business functions. Further, the Technology Modernization program is necessary to replace obsolete IT infrastructure, equipment, and applications that are no longer supported by the vendor. Several of the investments will upgrade/replace systems which are at end of life and will be moving off vendor support over the coming years. These investments cover systems which support billing/reporting through Meter Data Services, Work Force Operations, Control Center Operations and Emergency Planning. Without the appropriate upgrades, the Company's IT infrastructure is at risk of more frequent outages, which will jeopardize the Company's ability to perform its normal operations. Finally, reductions to the Cyber Security programs increase the risk to the

Company's databases, including customer and employee information, as well as critical infrastructure information.

D. AMI Program Changes

Q. Please describe the Company's adjustment to GIOP capital and operating expenditures based on the Commission's recent order approving the Company's AMI proposal?

A. On November 20, 2020, the Commission issued an order in the 2017 Rate Case approving the Company's AMI proposal with certain modifications. The rebuttal testimony and Exhibit __ (AMIP-4R) of the AMI Panel discuss the updates to the Company's capital plan and operating expenditures resulting from the Commission's order. The Company has also made corresponding adjustments to its gas capital plan in Exhibit __ (GIOP-1R) and Exhibit __ (GIOP-7R) to reflect the capital changes as well as operating expenditure adjustments are reflected in Exhibit___(RRP-2R), Schedule 2.

E. Capital Reporting

Q. Does the Company support the SGIOP's recommendations for capital reporting?

A. The Company supports capital reporting that is aligned with the reporting structure adopted in the 2017 Rate Case. The SGIOP, however, recommends that the reporting be aligned to the rate year as opposed to the Company's fiscal year. The Company believes that continuation of reporting on a fiscal year basis better aligns with the Company's financial budgeting and tracking processes and is consistent with the Company's presentation of its capital plan in this Panel's direct testimony. Therefore, the annual and quarterly capital

reporting should remain tied to the fiscal year. The Company is agreeable to adding new customers connected to its system to its capital reporting provided that the reporting is consistent with what is currently being provided in the KEDNY and KEDLI quarterly capital reports.

F. Update to General Inflation

Q. Does the Company have any other adjustments?

A. Yes. As discussed in the rebuttal testimony of the Revenue Requirements Panel, the Company has updated general inflation and has reflected that update in its exhibits.

Q. Does that conclude your testimony?

A. Yes.

INDEX OF EXHIBITS

Exhibit ___ (GIOP-1R):

Actual and Projected Direct Capital Expenditures: Historic Test Year and April 1, 2020 – March 31, 2025 (FY 2021 – FY 2025)

Niagara Mohawk Power Corporation d/b/a National Grid
Gas Capital Plan Includes COR

Classification	Category	CY19 Historic Test Year	FY2021	FY2022	FY2023	FY2024	FY2025
Customer Connections							
Mains & Svc	Customer Connections - Install Main	5,680,817	7,653,383	6,732,189	8,181,532	8,371,028	8,515,047
Mains & Svc	Customer Connections - Install Services	8,266,185	9,784,219	9,743,418	10,763,478	11,185,689	11,618,970
Mains & Svc	Customer Connections - Neighborhood Expansion Program - Main	645,954	-	-	-	-	-
Mains & Svc	Customer Connections - Neighborhood Expansion Program - Services	245,535	-	-	-	-	-
Mains & Svc	Customer Connections - Customer Contributions	(1,450,169)	(1,946,464)	(1,788,606)	(2,029,670)	(2,072,293)	(2,116,226)
Mains & Svc	Customer Connections - Install Meter/Regulator	2,158,528	3,079,858	2,830,082	3,211,514	3,278,955	3,348,469
Mains & Svc	Customer Connections - Fitting	5,030,008	5,435,077	4,994,292	5,667,411	5,786,427	5,909,099
Mains & Svc	Customer Connections - Special Projects	(521,462)	1,489,725	-	-	-	-
Meters/Hse Reg	Customer Connections - Meter Purchases		2,103,000	1,930,500	2,188,000	2,567,000	2,617,000
Mains & Svc	Gas System Reinforcement	4,968,732	5,839,278	3,436,158	8,620,067	5,168,520	5,571,800
Mains & Svc	LTUN12247_Rexford_Rt 146_New Main and Regulator	186,129	2,500,000	15,464,000	70,000	-	-
Mains & Svc	LTUN12350_Altamont_St Rt146_New Main	99,290	-	200,000	10,750,000	200,000	-
Mains & Svc	LTUN12375_Scehenctady_Uprate PL E36	23,162	1,560,722	-	-	-	-
Mains & Svc	PE Stamps Cost - Customer Connections		-	-	1,553,317	1,584,384	1,616,071
	Subtotal	**25,332,707**	**37,498,798**	**43,542,033**	**48,975,649**	**36,069,709**	**37,080,231**
Mandated							
Mains & Svc	CSC/Public Works - Non-Reimbursable	5,702,385	6,646,253	6,918,749	7,066,118	7,214,507	7,367,454
Mains & Svc	Interstate I-81 Relocation		265,000	2,828,960	1,507,720	1,274,262	625,683
Mains & Svc	Replace Pipe on Bridges	323,320	1,094,000	1,028,000	1,050,000	1,071,000	1,093,000
Mains & Svc	Cross Bore Remediation	1,119,465	500,000	500,000	300,000	-	-
Mains & Svc	Main Replacement (Proactive) - Leak Prone Pipe	50,976,679	59,942,061	58,265,759	67,296,951	69,315,860	71,395,336
Mains & Svc	Large Diameter Main Rehabilitation		-	-	-	6,488,000	6,618,000
Mains & Svc	Atmospheric Corrosion Inside Inspections (Remediation)	122,475	134,354	140,521	143,639	146,378	149,305
Mains & Svc	Transmission Services	1,821,720	3,500,480	4,288,000	4,365,000	-	-
Mains & Svc	Low Pressure Zones	758,856	945,820	2,000,000	2,500,000	3,000,000	3,000,000
Mains & Svc	Restrictions for Elevated Gas Infrastructure	118,877	1,093,820	750,000	765,000	780,000	796,000
Mains & Svc	Service Replacements (Reactive) - Non-Leaks/Other	5,364,928	6,281,743	6,413,660	6,550,271	6,687,826	6,829,608
Mains & Svc	Service Replacement (Reactive) - Leaks	2,088,885	3,312,910	3,382,481	3,454,528	3,527,073	3,601,847
Mains & Svc	Main Replacement (Reactive) - Maintenance	907,660	942,998	962,801	983,309	1,003,958	1,025,242
Mains & Svc	Proactive Low Pressure System Replacement		-	-	4,120,000	4,244,000	4,371,000
Mains & Svc	Contractor Safety Inspections		-	869,792	2,638,619	4,629,170	4,765,075
Mains & Svc	Pipeline Integrity IVP (Integrity Verification Program)	15,511,399	6,845,000	1,407,000	9,155,284	8,424,716	-
Mains & Svc	Pipeline Integrity IVP - PL 16 HCA Sections - Orange Commons			1,000,000	5,000,000	25,000,000	1,000,000
Mains & Svc	Pipeline Integrity IVP - PL 16 HCA Sections - Valve 1607 to Northern Blvd			1,000,000	1,000,000	500,000	75,000,000

Exhibit __ (GIOP-1R)
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Mains & Svc	Pipeline Integrity IVP - PL 16 HCA Sections - Valve 1603 to Lakeport Road			500,000	500,000	500,000	100,000
Mains & Svc	Pipeline Integrity IVP - PL E18 Pipeline Replacement			-	2,500,000	2,500,000	20,000,000
Mains & Svc	Pipeline Integrity IMP (Integrity Management Program)	13,798,602	24,939,640	26,975,000	14,657,356	28,005,284	20,930,000
Mains & Svc	Transmission Pipeline Washout	2,347,286	507,820	521,000	500,000	500,000	500,000
Mains & Svc	Transmission Pipeline (Reactive)	1,191,420	507,820	1,500,000	1,500,000	1,500,000	1,500,000
Mains & Svc	Transmission Station Integrity		912,000	3,007,000	12,928,000	13,187,000	13,451,000
Mains & Svc	Valve Installation/Replacement	7,872	111,000	111,000	113,000	115,000	118,000
Mains & Svc	Sectionalizing District Implementation		1,000,000	3,700,000	3,793,000	3,887,000	3,984,000
Meters/Hse Reg	Purchase Meters (Replacements)	6,946,822	6,428,000	6,556,000	6,688,000	7,844,000	8,002,000
Meters/Hse Reg	Install Elevated Pressure Meter Correctors	1,015,837	946,820	-	-	-	-
Meters/Hse Reg	Inactive Accounts			749,190	1,929,164	1,987,039	2,046,650
Meters/Hse Reg	ERT Replacement		1,660,000	2,300,000	2,500,000	2,000,000	2,000,000
Meters/Hse Reg	Meter Changes	3,874,034	5,063,380	4,739,680	4,839,210	4,940,840	5,044,590
Mains & Svc	Corrosion	1,058,300	2,365,240	2,533,000	2,578,000	2,627,000	2,679,000
Mains & Svc	Operator Qualifications testing		170,642	32,331	33,139	33,967	34,817
Mains & Svc	PE Stamps Cost - Mandated		-	-	2,355,466	2,402,575	2,450,626
	Subtotal	**115,056,820**	**136,116,800**	**144,979,924**	**175,310,774**	**215,336,455**	**270,478,234**
Reliability							
Meas. & Reg	Mapboard Replacement		-	-	-	560,000	-
Meas. & Reg	Gas Control Telemetry Upgrade 3G/4G	35,011	-	-	-	-	-
Mains & Svc	LTUN12251-Albany Loop Closure	1,872,388	775,000	775,000	750,000	4,000,000	40,000,000
Mains & Svc	LTUN_Gas System Reliability - Gas Planning/RCV Programs	2,820,563	619,000	2,569,621	4,430,099	2,923,187	5,239,032
Mains & Svc	LTUN10918_Rotterdam_Duanesburg Rd		3,420,705	-	-	-	-
Mains & Svc	LTUN-TBD-Flow control valve at Wolf Gate		3,347,328	-	-	-	-
Mains & Svc	LTUN12243_Rome_Oneida Station_RCV		-	-	-	2,184,451	-
Meas. & Reg	Heater Installation Program	894,985	1,997,440	2,315,000	2,314,000	2,147,000	2,349,000
Meas. & Reg	Pressure Regulating Facilities	2,481,993	4,117,000	5,567,000	5,690,000	5,801,000	5,909,000
Meas. & Reg	Pressure Reg Station - Washington Mills - GRS 824-643	434,993	2,330,000	30,000	-	-	-
Meas. & Reg	Pressure Reg Station - Mariaville Road Rotterdam - GRS 924-434	2,528,999	76,800	-	-	-	-
Meas. & Reg	Pressure Reg Station - Old Campion Road GRS 824-688		46,800	459,000	3,120,000	85,000	-
Meas. & Reg	Pressure Reg Station - Oneida Supply - GRS 824-709	366,912	2,491,000	82,000	-	-	-
Meas. & Reg	Pressure Reg Station - Cold Springs Rd - GRS 824-127	20,783	496,800	-	83,000	-	-
Meas. & Reg	Pressure Reg Station - Washington & Fuller - GRS 924-313	24,430	446,800	3,060,000	83,000	-	-
Meas. & Reg	Pressure Reg Station - Sandy Creek GRS 824-216A, 216B		46,800	459,000	3,120,000	85,000	-
Meas. & Reg	Pressure Reg Station - Valentine Rd GRS 924-452		-	-	52,000	477,000	3,240,000
Meas. & Reg	Pressure Reg Station - Delaware Ave GRS 924-402		-	50,000	468,000	3,180,000	86,000
Meas. & Reg	Pressure Reg Station - Yorkville GRS 824-644		-	50,000	468,000	3,180,000	86,000
Meas. & Reg	Pressure Reg Station - Dams Corners GRS 824-697		-	-	52,000	477,000	3,240,000
Meas. & Reg	Pressure Reg Station - Brookview GRS 924-336	1,281,356	96,800	-	-	-	-
Meas. & Reg	Pressure Reg Station - Harbor Point GRS 824-637		-	-	-	53,000	486,000
Meas. & Reg	Pressure Reg Station - Shellstone GRS 924-815	77,090	-	51,000	468,000	3,180,000	86,000
Meas. & Reg	Pressure Reg Station - Ellisburg GRS 824-308		-	-	52,000	477,000	3,240,000
Meas. & Reg	Pressure Reg Station - Alplaus Station Rebuild	30,717		-			

Exhibit __ (GIOP-1R)
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Meas. & Reg	Pressure Reg Station - OPP Vickerman Hill GRS-824-757	10,533		-			
Meas. & Reg	Renewable Natural Gas (RNG) Interconnections		459,000	468,000	478,000	487,000	994,000
Meas. & Reg	Gate Station Over Pressure Protection		720,000	2,499,000	1,872,000	-	-
Meas. & Reg	System Automation	503,745	995,000	1,343,000	1,369,000	1,395,000	1,422,000
Meas. & Reg	Distribution Station Over Pressure Protection		1,025,000	763,000	778,000	529,000	540,000
Meas. & Reg	Odorant Vapor Management at Gate Stations		-	50,000	200,000	200,000	150,000
Meas. & Reg	CNG - NIMO Blanket	597,527	-	200,000	200,000	200,000	200,000
Mains & Svc	Water Intrusion	196,173	443,320	1,008,357	1,030,731	1,050,386	1,071,393
Meas. & Reg	I&R - Reactive	589,193	339,320	307,381	314,201	320,192	326,596
Meas. & Reg	Gas Regulator Station Security	1,442,647	1,612,000	600,000	600,000	600,000	600,000
Meas. & Reg	Critical Spares		-	500,000	250,000	150,000	100,000
Meas. & Reg	Oil Seal Replacement		-	1,640,000	1,640,000	1,640,000	1,640,000
Meters/Hse Reg	Smart Residential Methane Detector Program		-	-	4,779,000	11,196,000	21,786,000
Meters/Hse Reg	Smart Gas Meter AMI Integration		-	-	-	2,520,000	2,382,000
Meters/Hse Reg	Low Pressure Zone Smart Meter Program		-	-	-	3,435,000	5,659,000
Meas. & Reg	Methane Emmission Reduction	29,089	830,800	-	-	-	-
Meas. & Reg	Watertown Sewalls Island Project	85,940					
Meas. & Reg	PE Stamps Cost - Reliability		-	-	41,616	42,448	43,297
	Subtotal	**16,325,068**	**26,732,713**	**24,846,359**	**34,702,647**	**52,574,665**	**100,875,319**
Non-Infrastructure							
Gen Equip	Tools & Equipment - All	573,780	840,000	1,086,000	1,110,000	3,306,000	1,154,000
Meters/Hse Reg	AMI		-	502,688	2,758,318	19,715,184	33,117,691
Gen Equip	Learning and Development - Materials, Tools and Equipment			375,000	250,000	187,500	187,500
Meters/Hse Reg	Meter Testing Equipment	639,022	204,000	106,120	108,240	110,410	112,620
	Subtotal	**1,212,801**	**1,044,000**	**2,069,808**	**4,226,558**	**23,319,094**	**34,571,811**
	Total Capital Including Cost of Removal	**157,927,397**	**201,392,311**	**215,438,124**	**263,215,627**	**327,299,923**	**443,005,595**
Mains & Svc	Cost of Removal	5,954,541	8,055,692	8,617,525	10,528,625	13,091,997	17,720,224
	Total Capital (Net of Removal)	**151,972,855**	**193,336,619**	**206,820,599**	**252,687,002**	**314,207,926**	**425,285,371**

Exhibit __ (GIOP-1R)
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Exhibit ___ (GIOP-5R):

Incremental O&M Non-Labor Expenditures: Rate Year, Data Year 1, and Data Year 2

Niagara Mohawk Power Corporation d/b/a National Grid
Gas Pipeline Safety and Gas Infrastructure and Operations Panels
Incremental Operating Expenses and FTE's

Units: $000's

Project/Programs	Cost Type	Expense Rate Year 2022	Expense Data Year 2023	Expense Data Year 2024	FTE Count Rate Year 2022	FTE Count Data Year 2023	FTE Count Data Year 2024
Gas Safety							
Bundled walking, atmospheric and Inside Inspections (POE Seal)	Labor & OH's	$ -	$ -	$ -	-	-	-
	Non-labor	$ 112.3	$ 108.9	$ 105.6			
	Total	$ 112.3	$ 108.9	$ 105.6			
Bundled walking, atmospheric and Inside Inspections (Walk Survey)	Labor & OH's	$ -	$ -	$ -	-	-	-
	Non-labor	$ 47.8	$ 48.6	$ 49.3			
	Total	$ 47.8	$ 48.6	$ 49.3			
Bundled walking, atmospheric and Inside Inspections (Mobile App)	Labor & OH's	$ -	$ -	$ -	-	-	-
	Non-labor	$ 2,303.1	$ 610.3	$ 610.3			
	Total	$ 2,303.1	$ 610.3	$ 610.3			
Enhanced Inactive Accounts Program	Labor & OH's	$ 43.9	$ 238.9	$ 243.3	7.0	20.0	20.0
	Non-labor	$ 364.0	$ 926.6	$ 926.6			
	Total	$ 407.8	$ 1,165.5	$ 1,169.9			
Enhanced Contractor Safety Inspections Program	Labor & OH's	$ 58.1	$ 177.7	$ 312.9	5.0	15.0	26.0
	Non-labor	$ 23.9	$ 68.5	$ 115.4			
	Total	$ 82.1	$ 246.2	$ 428.3			
Gas Technical Training Transformation	Labor & OH's	$ 1,627.0	$ 2,340.8	$ 2,818.1	16.0	23.0	27.0
	Non-labor	$ 315.3	$ 339.0	$ 342.5			
	Total	$ 1,942.3	$ 2,679.8	$ 3,160.6			
Pipeline Safety Management – Stakeholder Engagement	Labor & OH's	$ 15.7	$ 19.2	$ 19.6	0.2	0.2	0.2
	Non-labor	$ -	$ -	$ -			
	Total	$ 15.7	$ 19.2	$ 19.6			
Damage Prevention Program Enhancements	Labor & OH's	$ 173.5	$ 176.8	$ 180.0	1.0	1.0	1.0
	Non-labor	$ 6,318.8	$ 7,080.4	$ 7,827.8			
	Total	$ 6,492.3	$ 7,257.1	$ 8,007.8			
QA/QC Redig Program	Labor & OH's	$ 416.7	$ 424.5	$ 432.2	8.0	8.0	8.0
	Non-labor	$ 132.0	$ 158.4	$ 190.1			
	Total	$ 548.7	$ 582.9	$ 622.3			
Operator Qualification White Paper Implementation	Labor & OH's	$ -	$ -	$ -	-	-	-
	Non-labor	$ 49.6	$ 50.9	$ 52.1			
	Total	$ 49.6	$ 50.9	$ 52.1			
High Emitter Methane Detection Program	Labor & OH's	$ 170.1	$ 189.4	$ 192.8	2.0	2.0	2.0
	Non-labor	$ 875.0	$ 484.5	$ 494.2			
	Total	$ 1,045.1	$ 673.9	$ 687.0			
Voluntary Integrity Management Program	Labor & OH's	$ -	$ -	$ -	-	-	-
	Non-labor	$ 209.3	$ 842.3	$ 863.4			
	Total	$ 209.3	$ 842.3	$ 863.4			
Smart Meter and Residential Methane Detection Programs	Labor & OH's	$ 365.2	$ 466.1	$ 474.6	4.0	5.0	5.0
	Non-labor	$ 40.4	$ 50.5	$ 50.5			

Niagara Mohawk Power Corporation d/b/a National Grid
Gas Pipeline Safety and Gas Infrastructure and Operations Panels
Incremental Operating Expenses and FTE's

Units: $000's

Project/Programs	Cost Type	Expense Rate Year 2022	Expense Data Year 2023	Expense Data Year 2024	FTE Count Rate Year 2022	FTE Count Data Year 2023	FTE Count Data Year 2024
	Total	$ 405.6	$ 516.6	$ 525.1			
Single Meter Regulator Inspection Program	Labor & OH's	$ 1,546.0	$ 1,721.4	$ 1,752.8	16.0	16.0	16.0
	Non-labor	$ 151.6	$ 155.0	$ 158.6			
	Total	$ 1,697.5	$ 1,876.4	$ 1,911.4			
I&R Control Line Survey and GPS Mapping Program	Labor & OH's	$ -	$ -	$ -	-	-	-
	Non-labor	$ 1,000.0	$ 1,000.0	$ 500.0			
	Total	$ 1,000.0	$ 1,000.0	$ 500.0			
Enhanced First Responder Train-the Trainer Program	Labor & OH's	$ 39.7	$ 40.5	$ 41.2	2.0	2.0	2.0
	Non-labor	$ -	$ -	$ -			
	Total	$ 39.7	$ 40.5	$ 41.2			
GIOP							
Traditional Research & Development Program	Labor & OH's	$ -	$ -	$ -	-	-	-
	Non-labor	$ 1,220.0	$ 1,080.0	$ 1,110.0			
	Total	$ 1,220.0	$ 1,080.0	$ 1,110.0			
Capital Support - General	Labor & OH's	$ 133.0	$ 152.1	$ 168.4	13.0	14.0	15.0
	Non-labor	$ -	$ -	$ -			
	Total	$ 133.0	$ 152.1	$ 168.4			
I&R Supervisor Onboarding Initiative	Labor & OH's	$ 173.5	$ 176.8	$ 180.0	2.0	2.0	2.0
	Non-labor	$ -	$ -	$ -			
	Total	$ 173.5	$ 176.8	$ 180.0			
Pipeline Integrity (IVP)	Labor & OH's	$ 308.9	$ 314.7	$ 320.4	2.0	2.0	2.0
	Non-labor	$ 2,243.8	$ 2,550.3	$ 2,608.8			
	Total	$ 2,552.7	$ 2,865.0	$ 2,929.3			
Pipeline Integrity (IMP)	Labor & OH's	$ 175.8	$ 179.1	$ 182.4	3.5	3.5	3.5
	Non-labor	$ 1,241.2	$ (428.3)	$ (331.1)			
	Total	$ 1,417.0	$ (249.2)	$ (148.7)			
Transmission Station Integrity Program	Labor & OH's	$ 99.6	$ 101.5	$ 103.4	2.0	2.0	2.0
	Non-labor	$ 703.0	$ 1,589.0	$ 1,620.0			
	Total	$ 802.6	$ 1,690.5	$ 1,723.4			
Gas Regulator Station Security Project	Labor & OH's	$ -	$ -	$ -	-	-	-
	Non-labor	$ 66.0	$ 84.0	$ 102.0			
	Total	$ 66.0	$ 84.0	$ 102.0			
RNG Interconnection Maintenance	Labor & OH's	$ -	$ -	$ -	-	-	-
	Non-labor	$ 55.0	$ 110.0	$ 165.0			
	Total	$ 55.0	$ 110.0	$ 165.0			
Corrosion Control	Labor & OH's	$ 566.9	$ 577.6	$ 588.1	4.0	4.0	4.0
	Non-labor	$ -	$ -	$ -			
	Total	$ 566.9	$ 577.6	$ 588.1			

Niagara Mohawk Power Corporation d/b/a National Grid
Gas Pipeline Safety and Gas Infrastructure and Operations Panels
Incremental Operating Expenses and FTE's

Units: $000's

Project/Programs	Cost Type	Expense			FTE Count		
		Rate Year 2022	Data Year 2023	Data Year 2024	Rate Year 2022	Data Year 2023	Data Year 2024
	Grand Total	$ 23,385.5	$ 24,205.9	$ 25,571.3	87.7	119.7	135.7

Exhibit ___ (GIOP-6R):

Incremental Full Time Equivalent Positions by Function is the Rate Year, Data Year 1, and Data Year 2

Niagara Mohawk Power Corporation d/b/a National Grid
Incremental FTE's
Gas Pipeline Safety and Gas Infrastructure and Operations Panels

Panel	Program	Position	Rate Year 2022	Data Year 2023	Data Year 2024
Gas Safety					
	Enhanced Inactive Accounts Program	Gas Mechanic C	6	9	0
		Gas Supervisor	0	1	0
		Revenue Cycle Management Associate	1	2	0
		Service Representative B	0	1	0
	Enhanced Inactive Accounts Program Total		7	13	0
	Enhanced Contractor Safety Inspections Program	* Supervisor	1	2	2
		* Inspector	4	8	9
	Enhanced Contractor Safety Inspections Program Total		5	10	11
	Gas Technical Training Transformation	Field Evaluator	4	0	0
		* M&C Gas Mech / Tech	1	1	0
		Meter Service Rep / Tech	6	3	2
		Technical Training Field Mentor	5	3	2
	Gas Technical Training Transformation Total		16	7	4
	Pipeline Safety Management – Stakeholder Engagement	Regulatory Specialist	0.2	0	0
	Damage Prevention Program Enhancements	Supervisor	1	0	0
	QA/QC Redig Program	Pipeline Safety Management Specialist	8	0	0
	High Emitter Methane Detection Program	Gas Mechanic C	2	0	0
	Smart Meter and Residential Methane Detection Programs	Analyst	2	0	0
		Gas Meter Mechanic	1	0	0
		Service Rep	1	1	0
	Smart Meter and Residential Methane Detection Programs Total		4	1	0
	Single Meter Regulator Inspection Program	Field Supervisor	1	0	0
		Service Rep B	15	0	0
	Single Meter Regulator Inspection Program Total		16	0	0
	Enhanced First Responder Train-the Trainer Program	First Responder Instructor	2	0	0
Gas Safety Total			**61.2**	**31.0**	**15.0**
GIOP					
	Capital Support - General	* Associate Supervisor	1	1	0
		* Construction Planner	1	0	0
		* Lead Developer	2	0	0
		* Lead Supervisor	1	0	0
		* Manager, Gas PD	1	0	0
		* Manager, Gas PM	0	0	1
		* Principal PM	1	0	0
		* Project Manager	1	0	0
		* Senior Analyst	0.5	0	0
		* Senior Planner	0.5	0	0
		* Senior PM	2	0	0
		* Supervisor	2	0	0
	Capital Support - General Total		13	1	1
	I&R Supervisor Onboarding Initiative	Supervisor	2	0	0
	Pipeline Integrity (IVP)	Engineer IVP Team	2	0	0
	Pipeline Integrity (IMP)	* Engineer Capital Projects	1	0	0
		Engineer IMP Program	2	0	0
		Manager	0.5	0	0
	Pipeline Integrity (IMP) Total		3.5	0	0
	Transmission Station Integrity Program	* Engineer - Capital Projects	1	0	0
		Engineer - IMP	1	0	0
	Transmission Station Integrity Program Total		2	0	0
	Corrosion Control	Field Tester E Gas	4	0	0
GIOP Total			**26.5**	**1.0**	**1.0**
		Grand Total Incremental	87.7	32.0	16.0
		Grand Total Cumulative Incremental	87.7	119.7	135.7

Notes
* FTE's primarily support the capital investments plan

Exhibit ___ (GIOP-7R):

Total Gas Capital Related Expenditures: FY 2021 – FY 2025

NMPC Gas Rate Case
Total Gas Capital Related Expenditures and Regulatory Assets
FY21 - FY25

	FY21	FY22	FY23	FY24	FY25
Gas Direct Capex and Cost or Removal					
Gas Direct Capex	193,336,619	206,820,599	252,687,002	314,207,926	425,285,371
Gas Direct Cost of Removal	8,055,692	8,617,525	10,528,625	13,091,997	17,720,224
Gas Direct Capex and Cost of Removal - Total	201,392,311	215,438,124	263,215,627	327,299,923	443,005,595

	FY21	FY22	FY23	FY24	FY25
Future of Heat Capex					
Future of Heat Capex - Total	-	4,492,674	5,900,186	7,618,600	127,400

Gas Regulatory Assets	FY21	FY22	FY23	FY24	FY25
Geothermal	-	1,360,000	2,104,320	3,974,400	5,436,160
Gas Regulatory Assets - Total	-	1,360,000	2,104,320	3,974,400	5,436,160

Exhibit ___ (GIOP-11R):

Relevant Information Request ("IR") responses

Date of Request: November 20, 2019 Request No. DPS-242
Due Date: July 31, 2020 NMPC Req. No. NM GAS-PF242

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-XXXX and 20-G-XXXX
Electric and Gas Rates

Request for Information

SUBJECT: Research and Development (R&D) and Demonstration Activities - Internal Programs

Request:

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

242. For research and development expenses in which the company is requesting recovery in its revenue requirement:

a. State specifically how the company determines which projects it will undertake for research and development and how it establishes a budget for research and development;

b. indicate whether the company undertakes only those R&D projects that will have the most beneficial impact financially or are other criteria used to judge the merits of R&D projects;

c. describe how the company determines which R&D studies will be most beneficial on a cost benefit basis;

d. for each project that the company seeks funding for in the first rate year and subsequent two rate years, provide by month and account for the test period and link period the dollar amount of R&D incurred or to be incurred by the company. Provide a cost benefit analysis for each project.

Response:

a. The Company uses five criteria to judge the merits of R&D projects. The first criterion is safety. Some projects are undertaken to enhance the safety of the general public, our customers, and our workers in the field. The second criterion is compliance with regulations. For example, compliance with federal and state transmission pipeline safety regulations. In the Pipeline Safety Improvement Act of 2002, Congress directed the US Department of Transportation to establish and promote a research partnership with the natural gas industry to develop tools and techniques to improve pipeline safety. Over the last ten years, there are a number of tools and techniques that have been developed that

are now considered critical to pipeline safety, such as the robotics program for internal inspection of un-piggable pipelines. The third criterion is whether the project will increase the Company's knowledge about gas operations, which can lead to increased efficiencies, material improvements, and/or better techniques for conducting daily operations. The fourth criterion is environmental benefit considerations with a focus on new technologies and techniques in advanced leak and methane detection, the impact and reduction of methane emissions, residential methane detectors, and other projects related to climate change (renewable gas and hydrogen studies not covered elsewhere in this rate case), and manufactured gas plant (MGP) site remediation and monitoring. The fifth consideration is the cost and potential financial benefits of an R&D project.

b. Because most R&D projects have multiple benefits, cost/financial criteria are not the only consideration. For example, projects undertaken for worker safety can lower injuries and reduce sick time (thereby also providing a financial benefit). Also, projects to address compliance with pipeline regulations often improve the safety and reliability of the gas system, or there may be some environmental benefit. Therefore, a project with a marginal financial benefit may be approved if it meets one or more of the other criteria.

c. The Company may use a benefit/cost (B/C) ratio test as part of its analysis before adopting new technology into our operations. Benefits, however, may lie in the implementation of the technology or process to achieve the objectives of lower costs, increased safety, improved reliability, and lower environmental impacts. Costs are the project costs to fund, procure, and implement the new technology. In some cases, R&D studies can also lead to safety improvements where additional savings can be realized through reductions of injuries or accidents.

d. The Company seeks funding for non-Millennium (Internal) R&D projects in the Rate Year and Data Years. Internal research (also referred to as Traditional or non-Millennium) projects are research that is short term in duration, less than two years. In general, this funding is used to evaluate and pilot new methods, products, and technology. Examples include: advanced leak detection; auto/remote shut-off; composite materials, liners and related; damage prevention and locating; gas communications/IoT and smart technologies; drone applications for improving gas operations, inspections and safety; gas venting studies to limit venting to atmosphere; Global Navigation Satellite System (GNSS), Geospatial Information System (GIS) Data & Asset Tracking and Traceability; mobile technologies to increase efficiencies; pipeline safety: pipeline inspection, integrity management and Integrity Verification Program (IVP); short term studies regarding advancements in residential methane detectors; renewable natural gas (RNG); large diameter plastic; live main insertion, main installation via Plow; software related needs; Virtual Reality (VR) and Augmented Reality (AR): evaluations and demonstrations of these type of computer technologies and related devices for enhancing safety, and compliance. The Company needs to invest in internal research projects and technological advances for the benefit of its customers, to enhance safety, improve the environment, reduce costs, and increase efficiencies. Typically, the technology is tested for effectiveness before a B/C test is performed. The Operations group conducts the B/C test prior to implementation of a proven technology.

Please see Attachment 1 for the Company's projected spending for the programs, in rate and data years.

Name of Respondent:	Date of Reply:
Mary Holzmann	July 31, 2020

Short Term (Traditional/Internal) RD&D Request

			GIOP request		
			Breakdown by research area		
Paragraph	**Area**	**Description**	**7/1/2021-6/30/2022**	**7/1/2022-6/30/2023**	**7/1/2023-6/30/2024**
1	New tools and techniques for leak detection and/or "Advanced Leak Detection", methane quantification and related	Testing, demonstration and evaluation of advancements, tools and technology for leak detection technologies, their appropriate use and application in gas operations such as newer mini-laser based tool applications, or other new technologies that can enhance traditional surveys and address regulatory acceptance that are not included elsewhere in this rate case. Environmental and operational perspectives	$120,000	$70,000	$74,000
2	Auto/remote shut-off R&D and tests	Enhancing safety through shut-off devices coupled with various new sensors is a technical challenge being evaluated. Short-term internal research, development, demonstration and testing is necessary as new products in this area are coming to the market. Remote shut-off valves work that is not covered under Millennium is needed to evaluate new products from manufacturers, includes short term demonstrations. We want to try to understand how the performance of these new devices (i.e. meter valves) influence existing standards/code requirements.	$100,000	$103,000	$0
3	Communications/IoT	Evaluation and integration of communications with new "smart devices" into National Grid system may involve short term R&D efforts. Areas that are envisioned in this rate case include communications from dev such as Residential Methane Detectors, remote and/or auto-shut offs, new technology concerning AMI etc. and projects that are not specifically covered elsewhere in this rate case.	$150,000	$150,000	$150,000
4	Composite Materials, Liners and related	Work associated with composite pipe materials and liners for repair and rehabilitation, or renewed pipe related research looking at new technologies and techniques to restore pipe integrity and renew pipe through the proper application of liners. This includes work associated with re-classification of composite pipe as no longer being leak prone.	$16,000	$16,500	$17,500
5	Damage Prevention and Locate short term research	Studies and demonstrations of new technologies for improving locating quality and challenging locate areas. Efforts will include a demonstration, testing and evaluation of a technology to improve locate quality by UTTO Inc. Locate Assurance™. UTTO technology and field analytics may potentially help improve individual locator skills and technique. This will assist in training and in QA/QC for locate best practices, reduce mis-marks, and "can't locates", improve public safety and through the prevention of damagesEvaluate and develop means to improve locates for control linesOther new developments in this area will be assessed over the rate case period.	$70,000	$8,000	$8,500
6	Drones	It is necessary to conduct evaluations of various applications for drone usage in gas operations. Drone use to enhance mandated patrols could allow for better and faster identification of pipeline threats, third party activities, vegetation surveys and inspection of difficult to access locations (under bridges) through visual inspections. Drone sizes and payloads vary, further assessments are needed regarding enhancements to drone capabilities with additional features as technology advances to allow for additional payloads or miniaturization of additional inspection tools such as video recording capabilities, advanced imagery, LIDAR, feasibility of methane/leak detection need to be demonstrated, tested and evaluated for appropriate deployment.	$31,000	$31,500	$32,500
7	Gas Venting	The venting of gas during normal operation can be a significant source of methane release. It is necessary to investigate and develop new methods of dealing with those releases. This effort would field trial those methods to determine what is the best method to be use for day to day operations.	$16,000	$16,500	$17,500
8	Global Navigation Satellite System (GNSS), Geospatial Information System (GIS) Data & Asset Tracking and Traceability	System and equipment testing, demonstration and evaluation of the appropriate use and application of geospatial locating tools, technologies and advancement for use in gas operations to better understand this rapidly growing technology and how it can best be applied in daily operations to create operational efficiencies, enhance safety and regulatory compliance, and improve the quality of field collected data and company maps. Activities include technology demonstrations and integration, and may include a pilot project to collect accurate GIS location data on gas valves to assist in conflating asset data into GIS maps via demonstrations, evaluate best practices focused on this technology, aid in determining when costly high accuracy GPS is necessary and when it is not to find appropriate balance that will reduce the cost and complexity of deploying GNSS for routine construction and O&M activities.	$60,000	$62,000	$65,000
9	Mobile technologies: Demonstrations, evaluations and deployments of mobile technologies in construction, field inspections and leak survey	Evaluating applications 1)which integrate use of GPS, barcode scanning, and sensors to automate tracking and tracing of assets as they are constructed, facilitate creating as-built records, inventory tracking, and promote improved data quality by reducing manual entry. The technology may be able to create a complete record of field constructed assets including traceability for materials, fusions and joints, operator qualifications (under development), and pressure tests (under development) and deliver data for integration into enterprise systems such as GIS. 2) 3rd Party Electro-fusion inspection system evaluation/pilot test program to determine what features and functionality can potentially be integrated into our operations to enhance our fusion inspection process and safety. 3) Potential to automate gas leak reporting processes to eliminate or reduce non-compliance due to inaccurate reporting and help make changes from paper-based systems to digital.	$70,000	$70,500	$75,000
10	Pipeline Safety, Integrity Management and Integrity Verification Program (IVP)	With respect to Traditional R&D, a short term JIP project with MMT, Inc. is planned to look at long seam weld toughness of Gas Transmission Pipelines; we are looking new technologies and processes for gas transmission pipelines for material/MAOP verification; enhancing assessments of un-piggable pipelines and testing the boundaries of some newer technologies under challenging conditions to aid in the assessment of challenging configurations of pipe in hard to assess locations; Broadband Electro-Magnetic Testing (BEM) is an NDE process for evaluating the integrity of cast iron pipelines. BEM could provide the nondestructive technology (NDT) necessary to help determine replacement options that increase safety, reduce installation costs, reduce unnecessary exposure and damage to underground utility infrastructure, reduce impact on surface strata, reduce inconvenience to the community, and potentially can reduce the carbon footprint of modern renewable technologies. • Proper Pipe has developed a potential solution "Sure Seal Joint" to address electro-fusion joint integrity. Their product is an HDPE EF coupling that claims to allow for pressure testing across the joint at any time to ensure there is no leakage. An evaluation and lab testing to verify the claims of enhanced integrity of EF joints made with this coupling are necessary to determine if these can enhance safety on our gas distribution system.	$105,000	$78,000	$82,500
11	Residential Methane Detectors (RMDs)	Short term studies involving new products/near commercial devices, safety related and functional enhancements and communications tie-ins are necessary to improve current state of these devices to further improve customer and public safety.	$50,000	$52,000	$55,500
12	Renewable Natural Gas (RNG) and hydrogen	Some small short-term RNG and hydrogen RD&D work. Studies that are not covered elsewhere in this rate case.	$2,500	$3,000	$4,000
13	Virtual Reality (VR) and Augmented Reality (AR)	Evaluations and demonstrations of this type of computer technologies and related devices for enhancing safety, and compliance through simulated training environments, operator qualification process and augmented reality applications for gas operations skill development, situational awareness, emergency preparedness and adoption of new tools and technologies into performing gas operations and maintenance activities. We are working with other consortia members in the utility industry and identify potential AR developers for future training, operator qualification, educational, operation and maintenance applications. It is envisioned that AR technology will eventually allow field personnel to communicate and access real time information hands-free on the work activity that they are performing. This can enable the work to be done more efficiently, correctly and safely using the most current company procedures and manufacturer user manuals, for example. Currently, we are evaluating HoloLens and working with others on software needs for gas operations and enhancing safety.	$78,000	$65,000	$0
14	Large Diameter Plastic	Currently National Grid is limited to using 12" diameter plastic pipe. In the past this was due to the size constraints of the material testing lab and the availability molded fittings. There are now manufacturers that are producing molded plastic fittings. This effort would provide the testing of components up to 24" to be used initially for filler pieces for CIP projects. We will test fittings needed to ensure that typical maintenance can be performed on the pipeline after installation. Initial tooling would be purchased and tested to ensure that the installation of larger pipe can be embedded into the normal work stream. The use of plastic instead of steel pipe can reduce the cost of distribution projects.	$32,000	$33,000	$35,000
15	Live main insertion	This process has been used as the primary method of main replacement. The process has not been widely used at Nation Grid US. The technique uses the current infrastructure as the sleeve for the installation of new main. The tooling needs to be imported, tested and pilot projects performed to determine the cost benefits of the proces	$165,000	$170,000	$180,000
16	Main installation via Plow	This process has been widely used to install services in areas where few underground exist. We would like to use this technology on several projects outside the scope of existing programs such as for main installat to determine the capabilities of new plow technology, and benefits to the organizatio	$165,000	$170,000	$180,000
17	New technology not yet identified	The pace of new technologies is increasing and over the course of the rate case there will be new technologies and newly emerging tools to be evaluated that we cannot yet predict. Funds do need to be available for the currently unforeseen breakthroughs in technology.	$100,000	$125,000	$125,000
18	Software related needs	Develop requirements and bid packages as targeted needs are identified with regards to evaluation and adoption of new technology.	$50,000	$51,500	$55,000
			$1,380,500	$1,275,500	$1,157,000

Date of Request: August 28, 2020 Request No. DPS-473 (December 2020)
Due Date: December 8, 2020 NMPC Req. No. NM-510

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Sarah Keymel

TO: National Grid, Revenue Requirements Panel

SUBJECT: Other Initiatives - FTEs

Request:

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

Referring to Exhibit___(RRP-11), Workpapers to Exhibit RRP-3, Schedule 27, Workpaper 2, as it should be updated to include the missing positions as requested in DPS-472, the Company plans on hiring additional full-time equivalent (FTE) employees by the end of the Rate Year.

1. For each FTE, if the anticipated start date has already passed, state if the position is currently filled, and whether the position was filled internally or externally.

2. For each of the positions that were filled, state the actual start date and the amount of days between the actual start date and the anticipated start date presented in the Company's workpapers.

3. For each position that has not been filled and the anticipated start date of the position has passed, explain why the position has not been filled.

4. For any positions that have been hired internally, explain whether the Company has backfilled the vacated position.

5. Provide monthly updates to Questions 1 through 4, above on an on-going basis.

Response:

1. See Attachment 1 for the information requested in Parts 1 through 4.

2. See response to Part 1.

3. See response to Part 1.

4. See response to Part 1.

5. The Company will continue to respond to this on a monthly basis.

Name of Respondent:
Mark Stiner

Date of Reply:
December 8, 2020

National Grid Incremental FTEs
2020 NMPC Rate Case
Rate Year Beginning July 1, 2021
DPS-473 (December 2020)

NMPC

Key	Witness	Driver/Category	Original Job Title	Updated Job Title	Updated Start Date	RY1: June 2022	DY1: June 2023	DY2: June 2024	Mgmt/Rep	DPS-473 Requested Information: Part 1. Has position been filled	Part 1. Hire by "Internal" transfer or "External" hire	Part 2. Actual Hire Date	Part 2. Days between Start Date/Hire Date	Part 3. Explanation for not filling position if Start Date is passed	Part 4. Back-fill status if internal transfer	Rate Year Ending June 30, 2022: FTE Count	Data Year Ending June 30, 2023: FTE Count	Data Year Ending June 30, 2024: FTE Count
1	GPSP	Enhanced Damage Prevention Program	Supervisor	Supervisor	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
2	GPSP	L&D Gas Technical Training	Field Evaluator	Field Evaluator	7/1/2021	4.0	4.0	4.0	Management	No						4.0	4.0	4.0
3	GPSP	L&D Training - First Responder	First Responder Instructor	First Responder Instructor	7/1/2021	2.0	2.0	2.0	Management	No						2.0	2.0	2.0
4	GPSP	Pipeline Safety Regulatory Management	Regulatory Specilaist	Regulatory Specilaist	9/1/2021	1.0	1.0	1.0	Management	No						0.2	0.2	0.2
5	GPSP	QA/QC Redig Program	Pipeline Safety Management Specialist	Pipeline Safety Management Specialist	7/1/2021				Management									
5	GPSP	QA/QC Redig Program	Pipeline Safety Management Specialist	Pipeline Safety Management Specialist	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
5	GPSP	QA/QC Redig Program	Pipeline Safety Management Specialist	Pipeline Safety Management Specialist	7/1/2021	1.0	1.0	1.0	Management	Yes	External	8/24/2020	-311	N/A	N/A	1.0	1.0	1.0
5	GPSP	QA/QC Redig Program	Pipeline Safety Management Specialist	Pipeline Safety Management Specialist	7/1/2021	1.0	1.0	1.0	Management	Yes	External	3/16/2020	-472	N/A	N/A	1.0	1.0	1.0
5	GPSP	QA/QC Redig Program	Pipeline Safety Management Specialist	Pipeline Safety Management Specialist	7/1/2021	1.0	1.0	1.0	Management	Yes	Internal	4/1/2020	-456	N/A	Complete	1.0	1.0	1.0
5	GPSP	QA/QC Redig Program	Pipeline Safety Management Specialist	Pipeline Safety Management Specialist	7/1/2021	1.0	1.0	1.0	Management	Yes	External	7/13/2020	-353	N/A	N/A	1.0	1.0	1.0
5	GPSP	QA/QC Redig Program	Pipeline Safety Management Specialist	Pipeline Safety Management Specialist	7/1/2021	1.0	1.0	1.0	Management	Yes	External	8/24/2020	-311	N/A	N/A	1.0	1.0	1.0
6	GPSP	QA/QC Redig Program	Pipeline Safety Management Specialist	Pipeline Safety Management Specialist	7/1/2021	2.0	2.0	2.0	Management	No						2.0	2.0	2.0
7	GPSP	Service Regulator Inspection	Service Rep B	Service Rep B	8/1/2021	15.0	15.0	15.0	Union	No						15.0	15.0	15.0
7.1	GPSP	Service Regulator Inspection	Field Supervisor	Field Supervisor	8/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
8	GPSP	High Emitter Leak Repair	Gas Mechanic C	Gas Mechanic C	8/1/2021	2.0	2.0	2.0	Union	No						2.0	2.0	2.0
9	GIOP	Corrosion Control	Field Tester E Gas	Field Tester E Gas	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
10	GIOP	Corrosion Control	Field Tester E Gas	Field Tester E Gas	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
11	GIOP	Corrosion Control	Field Tester E Gas	Field Tester E Gas	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
12	GIOP	Corrosion Control	Field Tester E Gas	Field Tester E Gas	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
30	GIOP	I&R Supervisor Onboarding	Supervisor	Supervisor	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
31	GIOP	I&R Supervisor Onboarding	Supervisor	Supervisor	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
32	GPSP	Technical Training Transformation	Technical Training Field Mentor	Technical Training Field Mentor	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
33	GPSP	Technical Training Transformation	Technical Training Field Mentor	Technical Training Field Mentor	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
34	GPSP	Technical Training Transformation	Technical Training Field Mentor	Technical Training Field Mentor	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
35	GPSP	Technical Training Transformation	Technical Training Field Mentor	Technical Training Field Mentor	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
36	GPSP	Technical Training Transformation	Technical Training Field Mentor	Technical Training Field Mentor	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
37	GPSP	Technical Training Transformation	Technical Training Field Mentor	Technical Training Field Mentor	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
38	GPSP	Technical Training Transformation	Technical Training Field Mentor	Technical Training Field Mentor	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
39	GPSP	Technical Training Transformation	Technical Training Field Mentor	Technical Training Field Mentor	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
40	GPSP	Technical Training Transformation	Technical Training Field Mentor	Technical Training Field Mentor	7/1/2023	0.0	0.0	1.0	Union	No						-	-	1.0
41	GPSP	Technical Training Transformation	Technical Training Field Mentor	Technical Training Field Mentor	7/1/2023	0.0	0.0	1.0	Union	No						-	-	1.0
42	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
43	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
44	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
45	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
46	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
47	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
48	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
49	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
50	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
51	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2023	0.0	0.0	1.0	Union	No						-	-	1.0
52	GPSP	Technical Training Transformation	Meter Service Rep / Tech	Meter Service Rep / Tech	7/1/2023	0.0	0.0	1.0	Union	No						-	-	1.0
53	GPSP	Technical Training Transformation	M&C Gas Mech / Tech	M&C Gas Mech / Tech	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
54	GPSP	Technical Training Transformation	M&C Gas Mech / Tech	M&C Gas Mech / Tech	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
55	GPSP	Smart Gas Meter & RMD	Service Rep	Service Rep	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
56	GPSP	Smart Gas Meter & RMD	Analyst	Analyst	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
57	GPSP	Smart Gas Meter & RMD	Gas Meter Mechanic	Gas Meter Mechanic	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
58	GPSP	Smart Gas Meter & RMD	Analyst	Analyst	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
59	GPSP	Smart Gas Meter & RMD	Service Rep	Service Rep	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
60	GPSP	Smart Gas Meter & RMD	Service Rep	Service Rep	7/1/2024	0.0	0.0	0.0	Union	No						-	-	-
61	GPSP	Smart Gas Meter & RMD	Service Rep	Service Rep	7/1/2024	0.0	0.0	0.0	Union	No						-	-	-
62	GPSP	Contractor Safety Inspection	Supervisor	Supervisor	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
63	GPSP	Contractor Safety Inspection	Inspector	Inspector	7/1/2021	4.0	4.0	4.0	Management	No						4.0	4.0	4.0
64	GPSP	Contractor Safety Inspection	Supervisor	Supervisor	7/1/2022	0.0	2.0	2.0	Management	No						-	2.0	2.0
65	GPSP	Contractor Safety Inspection	Inspector	Inspector	7/1/2022	0.0	8.0	8.0	Management	No						-	8.0	8.0
66	GPSP	Contractor Safety Inspection	Supervisor	Supervisor	7/1/2023	0.0	0.0	2.0	Management	No						-	-	2.0
67	GPSP	Contractor Safety Inspection	Inspector	Inspector	7/1/2023	0.0	0.0	9.0	Management	No						-	-	9.0
68	GIOP	Pipeline Integrity (IMP)	Manager	Manager	7/1/2021	1.0	1.0	1.0	Management	Yes	Internal	4/1/2020	-456	N/A	Vacant and posted	0.5	0.5	0.5
69	GIOP	Pipeline Integrity (IMP)	Engineer IMP Program	Engineer IMP Program	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
70	GIOP	Pipeline Integrity (IMP)	Engineer IMP Program	Engineer IMP Program	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
71	GIOP	Pipeline Integrity (IMP)	Engineer Capital Projects	Engineer Capital Projects	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
72	GIOP	Pipeline Integrity (IVP)	Engineer IVP Team	Engineer IVP Team	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
73	GIOP	Pipeline Integrity (IVP)	Engineer IVP Team	Engineer IVP Team	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
74	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
75	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
76	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
77	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
78	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
79	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
80	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
81	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
82	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
83	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
84	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
85	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
86	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
87	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
88	GPSP	Enhanced Inactive Accounts	Gas Mechanic C	Gas Mechanic C	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
89	GPSP	Enhanced Inactive Accounts	Gas Supervisor	Gas Supervisor	7/1/2022	0.0	1.0	1.0	Management	No						-	1.0	1.0
90	GPSP	Enhanced Inactive Accounts	Revenue Cycle Management Associate	Revenue Cycle Management Associate	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
91	GPSP	Enhanced Inactive Accounts	Revenue Cycle Management Associate	Revenue Cycle Management Associate	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
92	GPSP	Enhanced Inactive Accounts	Revenue Cycle Management Associate	Revenue Cycle Management Associate	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
93	GPSP	Enhanced Inactive Accounts	Service Representative B	Service Representative B	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
94	GIOP	Capital Investment Plan Support	Manager, Gas PM	Manager, Gas PM	9/1/2023	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
95	GIOP	Capital Investment Plan Support	Principal PM	Principal PM	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
96	GIOP	Capital Investment Plan Support	Senior PM	Senior PM	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
97	GIOP	Capital Investment Plan Support	Senior PM	Senior PM	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
98	GIOP	Capital Investment Plan Support	Project Manager	Project Manager	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
99	GIOP	Capital Investment Plan Support	Construction Planner	Construction Planner	1/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
100	GIOP	Capital Investment Plan Support	Lead Supervisor	Lead Supervisor	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
101	GIOP	Capital Investment Plan Support	Supervisor	Supervisor	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
102	GIOP	Capital Investment Plan Support	Supervisor	Supervisor	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
103	GIOP	Capital Investment Plan Support	Associate Supervisor	Associate Supervisor	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
104	GIOP	Capital Investment Plan Support	Associate Supervisor	Associate Supervisor	7/1/2022		1.0	1.0	Management	No						-	1.0	1.0
105	GIOP	Capital Investment Plan Support	Lead Developer	Lead Developer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
106	GIOP	Capital Investment Plan Support	Lead Developer	Lead Developer	9/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
107	GIOP	Capital Investment Plan Support	Manager, Gas PD	Manager, Gas PD	12/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
110	GIOP	Station Integrity	Engineer - IMP	Engineer - IMP	7/1/2020	1.0	1.0	1.0	Management	Yes	External	8/24/2020	54	N/A	N/A	1.0	1.0	1.0
111	GIOP	Station Integrity	Engineer - Capital Projects	Engineer - Capital Projects	7/1/2020	1.0	1.0	1.0	Management	Yes	Internal	7/1/2020	0	N/A	Complete	1.0	1.0	1.0
46	CEP	Energy Efficiency	Sr Engineer	Sr Engineer	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
47	CEP	Energy Efficiency	Sr Analyst	Sr Analyst	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
48	CEP	Energy Efficiency	Sr. Sales rep	Sr. Sales rep	1/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
49	CEP	Energy Efficiency	Sr. Sales rep	Sr. Sales rep	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
50	CEP	Energy Efficiency	Sr. Sales rep	Sr. Sales rep	7/1/2022	0.0	1.0	1.0	Management	No	Will be determined close to the hire date					-	1.0	1.0
51	CEP	Energy Efficiency	Program Manager	Program Manager	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
52	CEP	Energy Efficiency	Program Manager	Program Manager	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
53	CEP	Energy Efficiency	Analyst	Analyst	7/1/2022	0.0	1.0	1.0	Management	No	Will be determined close to the hire date					-	1.0	1.0
54	CEP	Energy Efficiency	Program Manager	Program Manager	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
55	CEP	Energy Efficiency	Program Manager	Program Manager	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
56	CEP	Energy Efficiency	Program Manager	Program Manager	10/1/2020	1.0	1.0	1.0	Management	Yes	External	4/13/2020	-171	N/A	N/A	1.0	1.0	1.0
57	CEP	Energy Efficiency	Program Manager	Program Manager	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
58	CEP	Energy Efficiency	Program Manager	Program Manager	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
60	CEP	Energy Efficiency	Program Manager	Program Manager	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
61	CEP	Energy Efficiency	EEA	EEA	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
62	CEP	Energy Efficiency	Manager	Manager	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
62.1	CEP	Energy Efficiency	Sr Engineer	Sr Engineer	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
62.2	CEP	Energy Efficiency	Sr. Sales rep	Sr. Sales rep	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
62.3	CEP	Energy Efficiency	Sr. Channel Sales Sales rep	Sr. Channel Sales Sales rep	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
62.4	CEP	Energy Efficiency	Sr. Program Manager - SAP	Sr. Program Manager - SAP	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
62.5	CEP	Energy Efficiency	Analyst	Analyst	7/1/2022	0.0	1.0	1.0	Management	No	Will be determined close to the hire date					-	1.0	1.0
62.6	CEP	Energy Efficiency	Program Manager	Program Manager	1/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
62.7	CEP	Energy Efficiency	Program Manager	Program Manager	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
63	CEP	Energy Efficiency	Product Developer	Product Developer	1/1/2021	1.0	1.0	1.0	Management	Yes	External	1/4/2021	3	N/A	N/A	1.0	1.0	1.0
64	CEP	Energy Efficiency	Product Developer	Product Developer	1/1/2021	1.0	1.0	1.0	Management	Yes	External	1/4/2021	3	N/A	N/A	1.0	1.0	1.0
65	CEP	Energy Efficiency	Technical specialist	Technical specialist	1/1/2021	1.0	1.0	1.0	Management	Yes	External	1/4/2021	3	N/A	N/A	1.0	1.0	1.0
66	CEP	Energy Efficiency	Product Owner	Product Owner	1/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
67	CEP	Energy Efficiency	Product Owner	Product Owner	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
68	CEP	Energy Efficiency	Product Owner	Product Owner	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
69	CEP	Energy Efficiency	Product Owner	Product Owner	1/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
70	CEP	Energy Efficiency	Product Owner	Product Owner	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
71	CEP	Energy Efficiency	Product Owner	Product Owner	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
72	CEP	Energy Efficiency	Manager	Manager	1/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
73	CEP	Energy Efficiency	Analyst	Analyst	1/1/2021	1.0	1.0	1.0	Management	Yes	External	1/4/2021	3	N/A	N/A	1.0	1.0	1.0
74	CEP	Energy Efficiency	Lead Analyst	Lead Analyst	1/1/2021	1.0	1.0	1.0	Management	Yes	External	1/4/2021	3	N/A	N/A	1.0	1.0	1.0
75	CEP	Energy Efficiency	Lead Analyst	Lead Analyst	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
76	CEP	Energy Efficiency	Lead Analyst	Lead Analyst	1/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
76.1	CEP	Energy Efficiency	Lead Analyst	Lead Analyst	1/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
76.2	CEP	Energy Efficiency	Lead Analyst	Lead Analyst	1/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
77	CEP	Energy Efficiency	Analyst	Analyst	8/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0

National Grid Incremental FTEs
2020 NMPC Rate Case
Rate Year Beginning July 1, 2021
DPS-473 (December 2020)

NMPC

										DPS-473 Requested Information								
Key	Witness	Driver/Category	Original Job Title	Updated Job Title	Updated Start Date	RY1: June 2022	DY1: June 2023	DY2: June 2024	Mgmt/Rep	Part 1. Has position been filled	Part 1. Hire by "Internal" transfer or "External" hire	Part 2. Actual Hire Date	Part 2. Days between Start Date/Hire Date	Part 3. Explanation for not filling position if Start Date is passed	Part 4. Back-fill status if internal transfer	Rate Year Ending June 30, 2022: FTE Count	Data Year Ending June 30, 2023: FTE Count	Data Year Ending June 30, 2024: FTE Count
78	CEP	Energy Efficiency	Analyst	Analyst	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
79	CEP	Energy Efficiency	Strategic Sourcing Specialist	Strategic Sourcing Specialist	12/1/2020	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
80	CEP	Energy Efficiency	Sr. Analyst	Sr. Analyst	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
81	CEP	Energy Efficiency	Analyst	Analyst	7/1/2021	1.0	1.0	1.0	Management	No	Will be determined close to the hire date					1.0	1.0	1.0
9	EIOP	Capex Growth Support	Specialist - Stakeholder Engagement	Specialist - Stakeholder Engagement	7/1/2023	0.0	0.0	1.0	Management	No						-	-	1.0
11	EIOP	Capex Growth Support	Project Manager	Project Manager	4/30/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
12	EIOP	Capex Growth Support	Project Manager	Project Manager	5/31/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
13	EIOP	Capex Growth Support	Project Manager	Project Manager	6/15/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
14	EIOP	Capex Growth Support	Project Manager	Project Manager	6/30/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
15	EIOP	Capex Growth Support	Manager, Project Management	Manager, Project Management	3/30/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
19	EIOP	Capex Growth Support	Project Manager	Project Manager	2/15/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
20	EIOP	Capex Growth Support	Project Manager	Project Manager	3/30/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
21	EIOP	Capex Growth Support	Project Manager	Project Manager	3/30/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
25	EIOP	Capex Growth Support	Project Manager	Project Manager	12/15/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
26	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
27	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
28	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
29	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
30	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
31	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
32	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
33	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
34	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
35	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
36	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
37	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
38	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
39	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
40	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	2/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
41	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
42	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
43	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
44	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
45	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
46	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
47	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
48	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
49	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
50	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
51	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
52	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
53	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
54	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
55	EIOP	Capex Growth	Transmission Line Worker	Transmission Line Worker	6/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
56	EIOP	Capex Growth	Manager, Transmission Line Services	Manager, Transmission Line Services	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
57	EIOP	Capex Growth Support	Analyst	Analyst	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
58	EIOP	Capex Growth Support	Analyst	Analyst	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
59	EIOP	Capex Growth Support	Analyst	Analyst	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
60	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
61	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
62	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
64	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
65	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
66	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
67	EIOP	Capex Growth	Supervisor Substation Civil	Supervisor Substation Civil	1/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
68	EIOP	Capex Growth	Supervisor Substation Civil	Supervisor Substation Civil	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
69	EIOP	Capex Growth	Supervisor Substation Civil	Supervisor Substation Civil	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
70	EIOP	Capex Growth	Supervisor Substation Civil	Supervisor Substation Civil	11/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
71	EIOP	Capex Growth	Supervisor Substation Civil	Supervisor Substation Civil	11/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
72	EIOP	Capex Growth	Supervisor Substation Civil	Supervisor Substation Civil	11/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
73	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	6/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
74	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	6/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
75	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	6/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
76	EIOP	Capex Growth	Outage Planner	Outage Planner	1/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
77	EIOP	Capex Growth	Outage Planner	Outage Planner	6/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
78	EIOP	Capex Growth	Outage Planner	Outage Planner	6/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
79	EIOP	Capex Growth	Outage Planner	Outage Planner	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
80	EIOP	Capex Growth	Outage Planner	Outage Planner	6/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
81	EIOP	Capex Growth	Outage Planner	Outage Planner	6/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
82	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	1/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
83	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	1/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
84	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	1/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
85	EIOP	Capex Growth	Supervisor Substation Civil	Supervisor Substation Civil	1/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
86	EIOP	Capex Growth	Supervisor Substation Civil	Supervisor Substation Civil	1/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
87	EIOP	Capex Growth	Supervisor Substation Civil	Supervisor Substation Civil	1/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
90	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	4/1/2024	0.0	0.0	1.0	Management	No						-	-	1.0
93	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	4/1/2024	0.0	0.0	1.0	Management	No						-	-	1.0
96	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	4/1/2024	0.0	0.0	1.0	Management	No						-	-	1.0
96.1	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
96.2	EIOP	Capex Growth	Transmission Line Equipment Operator	Transmission Line Equipment Operator	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
96.3	EIOP	Capex Growth	Transmission Line Equipment Operator	Transmission Line Equipment Operator	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
96.4	EIOP	Capex Growth	Transmission Line Equipment Operator	Transmission Line Equipment Operator	2/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
96.5	EIOP	Capex Growth	Transmission Line Equipment Operator	Transmission Line Equipment Operator	6/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
96.6	EIOP	Capex Growth	Transmission Line Equipment Operator	Transmission Line Equipment Operator	6/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
96.7	EIOP	Capex Growth	Transmission Line Equipment Operator	Transmission Line Equipment Operator	6/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
96.8	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	7/20/2020	1.0	1.0	1.0	Management	Yes	External	7/1/2020	-19	N/A	N/A	1.0	1.0	1.0
97	EIOP	Capex Growth Support	Project Manager	Project Manager	5/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
98	EIOP	Capex Growth Support	Project Manager	Project Manager	7/1/2022	0.0	1.0	1.0	Management	No						-	1.0	1.0
99	EIOP	Capex Growth Support	Project Manager	Project Manager	9/15/2023	0.0	0.0	1.0	Management	No						-	-	1.0
100	EIOP	Capex Growth Support	Project Manager	Project Manager	7/15/2023	0.0	0.0	1.0	Management	No						-	-	1.0
101	EIOP	Capex Growth Support	Project Manager	Project Manager	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
114	EIOP	Capex Growth Support	Project Manager	Project Manager	12/30/2020	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
115	EIOP	Capex Growth Support	Director, Project Development	Director, Project Development	7/1/2021	1.0	1.0	1.0	Management	Yes	Internal	2/1/2020	-516	N/A	Complete	0.3	0.3	0.3
116	EIOP	Capex Growth Support	Project Manager	Project Manager	7/30/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
117	EIOP	Capex Growth Support	Project Manager	Project Manager	9/30/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
120	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	9/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
121	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	9/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
122	EIOP	Capex Growth	Supervisor Transmission and Distribution Line	Supervisor Transmission and Distribution Line	9/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
123	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
124	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
125	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
126	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
127	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
128	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
129	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
130	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
131	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
132	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
133	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
134	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
135	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
136	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
137	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
138	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
139	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
140	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
141	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
142	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
143	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
144	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
145	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
146	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
147	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
148	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
149	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
150	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
151	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
152	EIOP	Capex Growth	Distribution Line Mechanic	Distribution Line Mechanic	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
153	EIOP	Grid Mod	Transmission Control Center System Operator	Transmission Control Center System Operator	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
154	EIOP	Grid Mod	Transmission Control Center System Operator	Transmission Control Center System Operator	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
155	EIOP	Grid Mod	Transmission Control Center System Operator	Transmission Control Center System Operator	4/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
156	EIOP	Grid Mod	Transmission Control Center System Operator	Transmission Control Center System Operator	4/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
157	EIOP	Grid Mod	Transmission Control Center System Operator	Transmission Control Center System Operator	4/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
158	EIOP	Grid Mod	Transmission Control Center System Operator	Transmission Control Center System Operator	4/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
159	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
160	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
161	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
162	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
163	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
164	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
165	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
166	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
167	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
168	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
169	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
170	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
171	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
172	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
173	EIOP	Grid Mod	Supervisor Regional Control	Supervisor Regional Control	4/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
174	EIOP	Grid Mod	SF6 Reduction Engineer	SF6 Reduction Engineer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
175	EIOP	Grid Mod	SF6 Reduction Engineer	SF6 Reduction Engineer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
176	EIOP	Grid Mod	SF6 Reduction Engineer	SF6 Reduction Engineer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
179	EIOP	Capex Growth Support	Project Manager	Project Manager	7/1/2022	0.0	1.0	1.0	Management	No	Candidates will be considered from both Internal and external pools					-	1.0	1.0
180	EIOP	Capex Growth Support	Project Manager	Project Manager	7/1/2022	0.0	1.0	1.0	Management	No	Candidates will be considered from both Internal and external pools					-	1.0	1.0
181	EIOP	Capex Growth Support	Project Manager	Project Manager	7/1/2023	0.0	0.0	1.0	Management	No	Candidates will be considered from both Internal and external pools					-	-	1.0
182	EIOP	Grid Mod	Supervisor Transmission Control Center Operations	Supervisor Transmission Control Center Operations	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
183	EIOP	Capex Growth Support	Engineer	Engineer	4/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
184	EIOP	Capex Growth Support	Engineer	Engineer	4/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
185	EIOP	Capex Growth Support	Analyst	Analyst	4/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
187	EIOP	Capex Growth Support	Program Manager	Program Manager	1/1/2020	1.0	1.0	1.0	Management	Yes	Internal	1/1/2020	0	N/A	Complete	0.3	0.3	0.3
188	EIOP	Capex Growth Support	Program Manager	Program Manager	2/3/2020	1.0	1.0	1.0	Management	Yes	External	2/3/2020	0	N/A	N/A	0.3	0.3	0.3
189	EIOP	Capex Growth Support	Analyst	Analyst	2/1/2020	1.0	1.0	1.0	Management	Yes	Internal	2/1/2020	0	N/A	Complete	0.3	0.3	0.3
190	EIOP	Capex Growth Support	Analyst	Analyst	4/1/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
191	EIOP	Capex Growth Support	Change Management Specialist	Change Management Specialist	3/16/2020	1.0	1.0	1.0	Management	Yes	External	3/16/2020	0	N/A	N/A	0.3	0.3	0.3

National Grid Incremental FTEs
2020 NMPC Rate Case
Rate Year Beginning July 1, 2021
DPS-473 (December 2020)

NMPC

Key	Witness	Driver/Category	Original Job Title	Updated Job Title	Updated Start Date	RY1: June 2022	DY1: June 2023	DY2: June 2024	Mgmt/Rep	DPS-473 Requested Information: Part 1. Has position been filled	Part 1. Hire by "Internal" transfer or "External" hire	Part 2. Actual Hire Date	Part 2. Days between Start Date/Hire Date	Part 3. Explanation for not filling position if Start Date is passed	Part 4. Back-fill status if internal transfer	Rate Year Ending June 30, 2022: FTE Count	Data Year Ending June 30, 2023: FTE Count	Data Year Ending June 30, 2024: FTE Count
192	EIOP	Capex Growth Support	Operational Technology Specialist	Operational Technology Specialist	10/1/2020	1.0	1.0	1.0	Management	No				Current business environment has pushed hire date out to be evaluated		0.3	0.3	0.3
193	EIOP	Capex Growth Support	Operations Business Partner	Operations Business Partner	3/1/2020	1.0	1.0	1.0	Management	Yes	Internal	3/1/2020	0	N/A	Complete	0.3	0.3	0.3
194	EIOP	Capex Growth Support	Contract Management Business Partner	Contract Management Business Partner	4/1/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
195	EIOP	Capex Growth Support	Substation Designer	Substation Designer	7/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
196	EIOP	Capex Growth Support	Substation Designer	Substation Designer	3/1/2022	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
197	EIOP	Other	Supervisor Transmission I&M	Supervisor Transmission I&M	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
198	EIOP	Other	Analyst	Analyst	9/1/2020	1.0	1.0	1.0	Management	Yes	Internal	9/1/2020	0	N/A	Vacant; position supported all NGrid electric and gas operating companies	0.5	0.5	0.5
199	EIOP	Other	Program Manager	Program Manager	1/6/2020	1.0	1.0	1.0	Management	Yes	External	1/6/2020	0	N/A	N/A	0.5	0.5	0.5
206	EIOP	Capex Growth Support	Substation Designer	Substation Designer	6/8/2020	1.0	1.0	1.0	Union	Yes	Internal	6/8/2020	0	N/A	Vacant	1.0	1.0	1.0
207	EIOP	Capex Growth Support	Substation Designer	Substation Designer	6/8/2020	1.0	1.0	1.0	Union	Yes	Internal	6/8/2020	0	N/A	Vacant	1.0	1.0	1.0
208	EIOP	Capex Growth Support	Substation Designer	Substation Designer	6/8/2020	1.0	1.0	1.0	Union	Yes	Internal	6/8/2020	0	N/A	Vacant	1.0	1.0	1.0
209	EIOP	Other	Supervisor Transmission I&M	Supervisor Transmission I&M	12/1/2020	1.0	1.0	1.0	Management	No				Current business environment has pushed hire date out		1.0	1.0	1.0
210	EIOP	Capex Growth Support	Telecom Engineer	Telecom Engineer	6/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
211	EIOP	Capex Growth Support	Control and Protection Engineer	Control and Protection Engineer	9/1/2022	0.0	1.0	1.0	Management	No						-	1.0	1.0
212	EIOP	Capex Growth Support	Control and Protection Engineer	Control and Protection Engineer	9/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
213	EIOP	Capex Growth Support	Telecom Engineer	Telecom Engineer	10/1/2022	0.0	1.0	1.0	Management	No						-	1.0	1.0
214	EIOP	Capex Growth Support	Telecom Engineer	Telecom Engineer	1/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
215	EIOP	Capex Growth Support	Telecom Engineer	Telecom Engineer	3/1/2022	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
216	EIOP	Capex Growth Support	Electric Planning and Design Engineer	Electric Planning and Design Engineer	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
217	EIOP	Capex Growth Support	Electric Planning and Design Engineer	Electric Planning and Design Engineer	7/1/2021	1.0	1.0	1.0	Management	Yes	Internal	2/1/2020	-516	N/A	Vacant	1.0	1.0	1.0
218	EIOP	Capex Growth Support	Electric Planning and Design Engineer	Electric Planning and Design Engineer	10/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
219	EIOP	Capex Growth Support	Electric Planning and Design Engineer	Electric Planning and Design Engineer	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
220	EIOP	Capex Growth Support	Electric Planning and Design Engineer	Electric Planning and Design Engineer	1/2/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
221	EIOP	Capex Growth Support	Control and Protection Engineer	Control and Protection Engineer	6/1/2023	0.0	1.0	1.0	Management	No						-	1.0	1.0
222	EIOP	Capex Growth Support	Telecom Engineer	Telecom Engineer	10/1/2023	0.0	0.0	1.0	Management	No						-	-	1.0
223	EIOP	Capex Growth Support	Telecom Engineer	Telecom Engineer	5/1/2024	0.0	0.0	1.0	Management	No						-	-	1.0
225	EIOP	Capex Growth Support	Engineering Manager	Engineering Manager	2/1/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
226	EIOP	Capex Growth Support	Engineer	Engineer	8/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
228	EIOP	Capex Growth Support	Analyst	Analyst	3/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
228.1	EIOP	Capex Growth Support	Engineer	Engineer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
228.2	EIOP	Capex Growth Support	Telecom Engineer	Telecom Engineer	4/1/2021	1.0	1.0	1.0	Management	No						0.5	0.5	0.5
230	EIOP	Capex Growth Support	Analyst	Analyst	10/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
231	EIOP	Capex Growth Support	Senior Analyst	Senior Analyst	12/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
235	EIOP	Capex Growth Support	Lead Planner	Lead Planner	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
241	GIOP	Capital Investment Plan Support	Senior Analyst	Senior Analyst	3/1/2022	1.0	1.0	1.0	Management	No						0.5	0.5	0.5
243	GIOP	Capital Investment Plan Support	Senior Planner	Senior Planner	7/1/2021	1.0	1.0	1.0	Management	No						0.5	0.5	0.5
248	EIOP	Capex Growth Support	Sourcing Specialist	Sourcing Specialist	4/1/2021	1.0	1.0	1.0	Management	No						0.5	0.5	0.5
249	EIOP	Capex Growth Support	Sourcing Specialist	Sourcing Specialist	4/1/2021	1.0	1.0	1.0	Management	No						0.5	0.5	0.5
250	EIOP	Capex Growth Support	Sourcing Specialist	Sourcing Specialist	4/1/2021	1.0	1.0	1.0	Management	No						0.5	0.5	0.5
251	EIOP	Capex Growth Support	Sr. Sourcing Specialist	Sr. Sourcing Specialist	4/1/2021	1.0	1.0	1.0	Management	No						0.5	0.5	0.5
252	EIOP	Capex Growth Support	Process Lead	Process Lead	4/1/2021	1.0	1.0	1.0	Management	No						0.2	0.2	0.2
253	EIOP	Capex Growth Support	Analyst	Analyst	4/1/2021	1.0	1.0	1.0	Management	No						0.2	0.2	0.2
254	EIOP	Capex Growth Support	Principle Analyst	Principal Analyst	4/1/2021	1.0	1.0	1.0	Management	No						0.2	0.2	0.2
255	EIOP	Capex Growth Support	Quantity Surveyor/Cost Manager	Quantity Surveyor/Cost Manager	4/20/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
256	EIOP	Capex Growth Support	Quantity Surveyor/Cost Manager	Quantity Surveyor/Cost Manager	4/20/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
257	EIOP	Capex Growth Support	Quantity Surveyor/Cost Manager	Quantity Surveyor/Cost Manager	4/20/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
258	EIOP	Capex Growth Support	Quantity Surveyor/Cost Manager	Quantity Surveyor/Cost Manager	4/20/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
263	EIOP	Capex Growth Support	Planner	Planner	4/1/2021	1.0	1.0	1.0	Management	No						0.5	0.5	0.5
264	EIOP	Capex Growth Support	Planner	Planner	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
267	EIOP	Capex Growth Support	Planner	Planner	7/1/2022	0.0	1.0	1.0	Management	No						-	1.0	1.0
271	EIOP	Capex Growth Support	Sr. Sourcing Specialist	Sr. Sourcing Specialist	4/1/2021	1.0	1.0	1.0	Management	No						0.5	0.5	0.5
272	EIOP	Capex Growth Support	Planner	Planner	7/1/2022	0.0	1.0	1.0	Management	No						-	1.0	1.0
274	EIOP	Capex Growth Support	Planner	Planner	7/1/2022	0.0	1.0	1.0	Management	No						-	1.0	1.0
275	EIOP	Capex Growth Support	Estimating Manager	Estimating Manager	5/1/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
276	EIOP	Capex Growth Support	Estimator	Estimator	5/1/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
277	EIOP	Capex Growth Support	Estimator	Estimator	6/1/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
278	EIOP	Capex Growth Support	Estimator	Estimator	7/1/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
279	EIOP	Capex Growth Support	Estimator	Estimator	6/1/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
280	EIOP	Capex Growth Support	Estimator	Estimator	7/1/2021	1.0	1.0	1.0	Management	No						0.3	0.3	0.3
281	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2024	0.0	0.0	0.0	Union	No						-	-	-
282	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2024	0.0	0.0	0.0	Union	No						-	-	-
283	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2024	0.0	0.0	0.0	Union	No						-	-	-
284	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2024	0.0	0.0	0.0	Union	No						-	-	-
287	EIOP	Capex Growth	Supervisor PTO	Supervisor PTO	7/1/2020	1.0	1.0	1.0	Management	Yes	External	6/3/2019	-394	N/A	N/A	1.0	1.0	1.0
288	EIOP	Capex Growth	Supervisor PTO	Supervisor PTO	8/1/2020	1.0	1.0	1.0	Management	Yes	Internal	10/1/2020	61	N/A	Vacant	1.0	1.0	1.0
289	EIOP	Capex Growth	Supervisor PTO	Supervisor PTO	8/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
290	EIOP	Capex Growth	Supervisor PTO	Supervisor PTO	7/1/2022	0.0	1.0	1.0	Management	No						-	1.0	1.0
293	EIOP	Capex Growth	PTO Technician	PTO Technician	1/1/2020	1.0	1.0	1.0	Union	Yes	Internal	6/14/2020	165	N/A	Vacant	1.0	1.0	1.0
294	EIOP	Capex Growth	PTO Technician	PTO Technician	11/1/2020	1.0	1.0	1.0	Union	No				Current business environment has pushed hire date out		1.0	1.0	1.0
295	EIOP	Capex Growth	PTO Technician	PTO Technician	4/1/2020	1.0	1.0	1.0	Union	Yes	Internal	6/14/2020	74	N/A	Filled	1.0	1.0	1.0
296	EIOP	Capex Growth	PTO Technician	PTO Technician	4/1/2020	1.0	1.0	1.0	Union	Yes	Internal	5/17/2020	46	N/A	Vacant	1.0	1.0	1.0
297	EIOP	Capex Growth	PTO Technician	PTO Technician	4/1/2020	1.0	1.0	1.0	Union	Yes	Internal	6/7/2020	67	N/A	Filled	1.0	1.0	1.0
298	EIOP	Capex Growth	PTO Technician	PTO Technician	10/14/2020	1.0	1.0	1.0	Union	No				Current business environment has pushed hire date out		1.0	1.0	1.0
299	EIOP	Capex Growth	PTO Technician	PTO Technician	10/14/2020	1.0	1.0	1.0	Union	No				Current business environment has pushed hire date out		1.0	1.0	1.0
300	EIOP	Capex Growth	PTO Technician	PTO Technician	11/1/2020	1.0	1.0	1.0	Union	No				Current business environment has pushed hire date out		1.0	1.0	1.0
301	EIOP	Capex Growth	PTO Technician	PTO Technician	11/1/2020	1.0	1.0	1.0	Union	No				Current business environment has pushed hire date out		1.0	1.0	1.0
302	EIOP	Capex Growth	PTO Technician	PTO Technician	11/1/2020	1.0	1.0	1.0	Union	No				Current business environment has pushed hire date out		1.0	1.0	1.0
309	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
310	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
311	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
312	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2022	0.0	1.0	1.0	Union	No						-	1.0	1.0
315	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2023	0.0	0.0	1.0	Union	No						-	-	1.0
316	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2023	0.0	0.0	1.0	Union	No						-	-	1.0
317	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2023	0.0	0.0	1.0	Union	No						-	-	1.0
318	EIOP	Capex Growth	PTO Technician	PTO Technician	7/1/2023	0.0	0.0	1.0	Union	No						-	-	1.0
321	EIOP	Other	Program Manager	Program Manager	7/1/2021	1.0	1.0	1.0	Management	No						0.4	0.4	0.4
322	EIOP	Grid Mod	Distribuion Planning Engineer	Distribution Planning Engineer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
323	EIOP	Grid Mod	Distribuion Planning Engineer	Distribution Planning Engineer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
324	EIOP	Grid Mod	Distribuion Planning Engineer	Distribution Planning Engineer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
327	EIOP	Grid Mod	Distribuion Planning Engineer	Distribution Planning Engineer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
328	EIOP	Grid Mod	Distribuion Planning Engineer	Distribution Planning Engineer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
328.1	EIOP	Grid Mod	Distribuion Planning Engineer	Distribution Planning Engineer	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
332	EIOP	Capex Growth	Distribution Designer	Distribution Designer	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
333	EIOP	Capex Growth	Distribution Designer	Distribution Designer	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
334	EIOP	Capex Growth	Distribution Designer	Distribution Designer	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
335	EIOP	Capex Growth	Distribution Designer	Distribution Designer	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
336	EIOP	Capex Growth	Distribution Designer	Distribution Designer	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
337	EIOP	Capex Growth	Distribution Designer	Distribution Designer	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
345	EIOP	Capex Growth	Distribution Designer	Distribution Designer	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
346	EIOP	Capex Growth	Distribution Designer	Distribution Designer	9/1/2021	1.0	1.0	1.0	Union	No						1.0	1.0	1.0
347	EIOP	Capex Growth	Supervisor Design	Supervisor Design	9/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
360	EIOP	Capex Growth Support	Meter Engineer	Meter Engineer	6/1/2021	1.0	1.0	1.0	Management	No						0.8	0.8	0.8
361	EIOP	Capex Growth Support	Telecom Engineer	Telecom Engineer	4/1/2022	1.0	1.0	1.0	Management	No						0.8	0.8	0.8
362	EIOP	Capex Growth Support	Meter Engineer	Meter Engineer	6/1/2021	1.0	1.0	1.0	Management	No						0.8	0.8	0.8
364	EIOP	Capex Growth Support	Meter Engineer	Meter Engineer	4/1/2022	1.0	1.0	1.0	Management	No						0.8	0.8	0.8
365	EIOP	Capex Growth Support	Meter Engineer	Meter Engineer	5/1/2022	1.0	1.0	1.0	Management	No						0.8	0.8	0.8
366	EIOP	Grid Mod	Analyst	Analyst	7/1/2022	0.0	1.0	1.0	Management	No						-	1.0	1.0
367	EIOP	Capex Growth Support	Substation Engineer	Substation Engineer	6/1/2020	1.0	1.0	1.0	Management	Yes	External	6/8/2020	7	N/A	N/A	1.0	1.0	1.0
368	EIOP	Capex Growth Support	Substation Engineer	Substation Engineer	6/1/2020	1.0	1.0	1.0	Management	Yes	External	6/8/2020	7	N/A	N/A	1.0	1.0	1.0
369	EIOP	Other	Analyst	Analyst	9/1/2020	1.0	1.0	1.0	Management	Yes	External	9/20/2020	19	Best qualified candidate identified and made offer in August. Start date is aligned with our HR processes to complete background checks and other pre-equisites	N/A	0.5	0.5	0.5
370	EIOP	Other	Analyst	Analyst	12/1/2020	1.0	1.0	1.0	Management	Yes	External	9/20/2020	-72	N/A	N/A	0.5	0.5	0.5
371	EIOP	Other	Analyst	Analyst	4/1/2021	1.0	1.0	1.0	Management	No	TBD					0.5	0.5	0.5
360	OLP	Outdoor Lighting - NY	Manager - Outdoor Lighting-NY	Manager - Outdoor Lighting-NY	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
361	OLP	Outdoor Lighting - NY	Analyst	Analyst	4/1/2021	1.0	1.0	1.0	Management	No					N/A	1.0	1.0	1.0
362	FOH	Expanded Demand Response	Program Manager	Program Manager	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
363	FOH	Expanded Demand Response	Project Manager	Project Manager	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
364	FOH	Geothermal Initiatives	Program Manager	Program Manager	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
365	FOH	Geothermal Initiatives	Project Manager	Project Manager	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
369	FOH	Multi-use Hydrogen	Program Manager	Program Manager	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	-
369.1	FOH	Multi-use Hydrogen	Program Manager	Program Manager	7/1/2023	0.0	0.0	1.0	Management	No						-	-	1.0
373	FOH	Fuel Switching Calculator	Program Manager - NMPC	Program Manager - NMPC	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
374	FOH	Local RNG Procurement Programs	Program Manager	Program Manager	4/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
376	FOH	CCUS Pilot	Program Manager	Program Manager	7/1/2022		1.0	1.0	Management	No						-	1.0	1.0
377	EVP	Clean Transportation EV	Lead Program Manager	Lead Program Manager	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
378	EVP	Clean Transportation EV	Program Manager	Program Manager	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
379	EVP	Clean Transportation EV	Lead Program Manager	Lead Program Manager	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
380	EVP	Clean Transportation EV	Program Manager	Program Manager	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
381	EVP	Clean Transportation EV	Senior Program Manager	Manager	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
381.1	EVP	Clean Transportation EV	Senior Program Manager	Lead Program Manager	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
382	EVP	Clean Transportation EV	Senior Program Manager	Senior Program Manager	1/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
382.1	EIOP	Grid Mod	Senior Program Manager	Lead Engineer	1/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
383	EVP	Clean Transportation EV	Analyst	Analyst	1/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
385	EVP	Clean Transportation EV	Snr. Rep., Customer Connections	Snr. Rep., Customer Connections	10/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
386.1	EVP	Clean Transportation EV	Sales Representative	Sales Representative	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
386.2	EVP	Clean Transportation EV	Sales Representative	Sales Representative	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
390	EVP	Clean Transportation EV	Senior Program Manager	Senior Program Manager	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
391	EVP	Clean Transportation EV	Lead Program Manager	Lead Program Manager	7/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
391.1	EVP	Clean Transportation EV	Analyst	Marketing Specialist	1/1/2021	1.0	1.0	1.0	Management	No						1.0	1.0	1.0
392	OLP	Outdoor Lighting - NY	Consumer Representative A	Consumer Representative A	4/1/2021	1.0	1.0	1.0	Union	No					N/A	1.0	1.0	1.0
393	OLP	Outdoor Lighting - NY	Consumer Representative A	Consumer Representative A	4/1/2021	1.0	1.0	1.0	Union	No					N/A	1.0	1.0	1.0
394	OLP	Outdoor Lighting - NY	Consumer Representative A	Consumer Representative A	10/1/2021	1.0	1.0	1.0	Union	No					N/A	1.0	1.0	1.0
395	OLP	Outdoor Lighting - NY	Consumer Representative A	Consumer Representative A	10/1/2021	1.0	1.0	1.0	Union	No					N/A	1.0	1.0	1.0
396	OLP	Outdoor Lighting - NY	Consumer Representative A	Consumer Representative A	10/1/2021	1.0	1.0	1.0	Union	No					N/A	1.0	1.0	1.0
397	OLP	Outdoor Lighting - NY	Consumer Representative A	Consumer Representative A	4/1/2022	1.0	1.0	1.0	Union	No					N/A	1.0	1.0	1.0
398	OLP	Outdoor Lighting - NY	Consumer Representative A	Consumer Representative A	4/1/2022	1.0	1.0	1.0	Union	No					N/A	1.0	1.0	1.0
399	OLP	Outdoor Lighting - NY	Consumer Representative A	Consumer Representative A	4/1/2022	1.0	1.0	1.0	Union	No					N/A	1.0	1.0	1.0
400	OLP	Outdoor Lighting - NY	Consumer Representative A	Consumer Representative A	4/1/2021	1.0	1.0	1.0	Union	No					N/A	1.0	1.0	1.0
404	SSP	EAP Outreach Program	Program administrator	EAP Program Lead	4/1/2021	1.0	1.0	1.0	Management	No					N/A	0.5	0.5	0.5
405	SSP	EAP Outreach Program	Education and Outreach (Marketing)	EAP Education and Outreach Lead	4/1/2021	1.0	1.0	1.0	Management	No					N/A	0.5	0.5	0.5
406	RRP	Legal	Senior Counsel II	Snr Counsel II In House Counsel	4/1/2020	1.0	1.0	1.0	Management	Yes	External	4/1/2020	0	N/A	N/A	0.3	0.3	0.3
407	RRP	Legal	Senior Counsel II	Snr Counsel II In House Counsel	4/1/2020	1.0	1.0	1.0	Management	Yes	External	4/1/2020	0	N/A	N/A	0.3	0.3	0.3
408	RRP	Legal	Senior Counsel II	Snr Counsel II In House Counsel	4/1/2020	1.0	1.0	1.0	Management	Yes	External	10/5/2020	187	N/A	N/A	0.3	0.3	0.3
409	RRP	Legal	Senior Counsel II	Snr Counsel II In House Counsel	10/31/2020	1.0	1.0	1.0	Management	Yes	External	11/30/2020	30	N/A	N/A	0.3	0.3	0.3
						392.0	**460.0**	**488.0**								**362.0**	**430.0**	**458.0**

Date of Request: September 23, 2020 Request No. DPS-754
Due Date: October 5, 2020 NMPC Req. No. NM-921

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Davide Maioriello

TO: National Grid, Future of Heat & Gas Infrastructure and Operations Panel

SUBJECT: Albany Loop Project

Request:

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

On page 75 of the Direct Testimony of the GIOP, the Company describes temporarily deferring the Albany Loop Project:

1. Has the Company solicited for any non-pipe alternatives (NPA) to the project? If so, provide details of such solicitations and outcome. If not, describe in detail why the Company has decided not to do such solicitations for NPAs.

2. If the Albany Loop Project does not receive the necessary approvals to commence implementation of the project, what are the expected system reliability and supply impacts that such a determination would have to the service areas? Provide a service area location and time frame for all listed impacts including any expected moratoria on gas service.

3. Provide a separate long-term 10 to 15-year supply/demand forecast for the design-day. Include a list of all major capital projects with projected in-service dates the Company plans to implement to meet the need of the forecast demand.

4. Provide a 10-year peak-hour (design-hour) supply demand chart for East Gate.

Response:

1. The proposed Albany Loop Project is designed to provide significant customer benefits, including distribution system resiliency for approximately 50,000 gas customers by allowing gas supplies to flow to these customers from multiple sources in the event of a

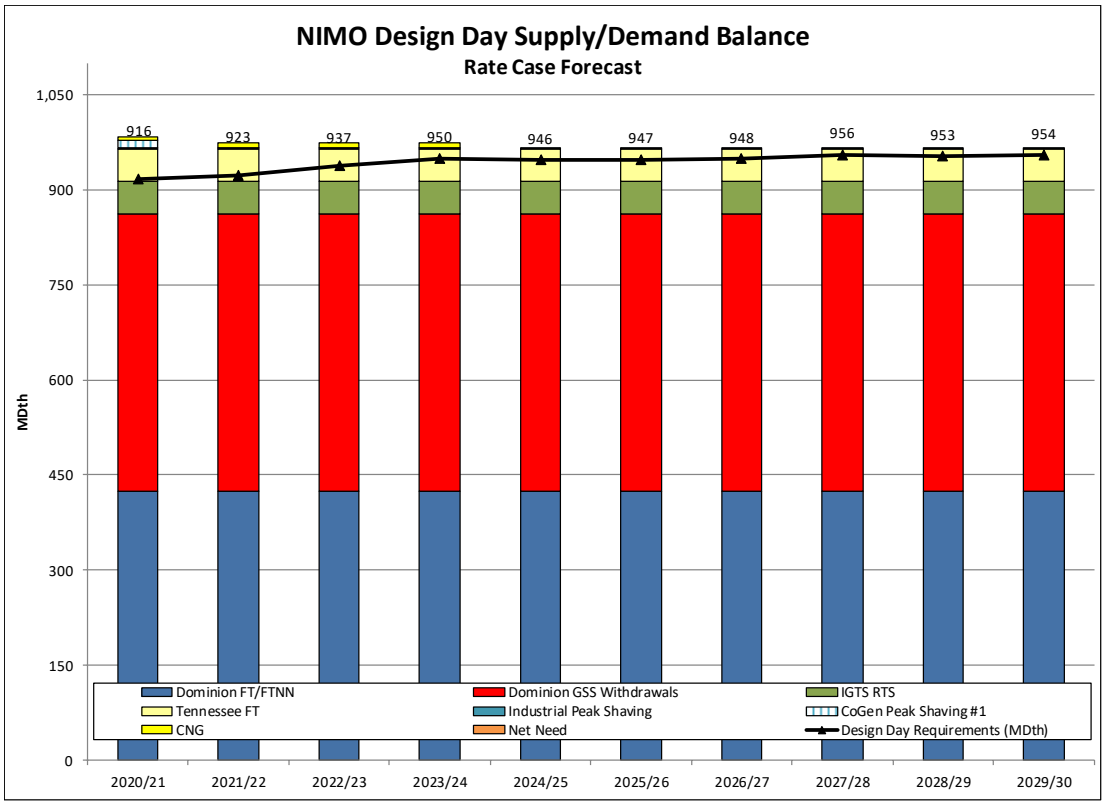
failure. The project also mitigates projected hourly and daily contractual shortfalls at several city gate interconnects with Dominion Energy Transmission, Inc. ("DETI").

The Company has not considered any specific non-pipe alternatives ("NPAs") for this project because there is no single NPA that could provide the same level of operational benefits. The Company, however, is developing a portfolio of demand side management solutions, as well as a process for soliciting and reviewing potential NPAs. As described in the Company's testimony, the cumulative impact of these demand side initiatives could defer the need for the Albany Loop Project. Please see the Company's response to PACE_AGREE-077 for a description of the Company's general approach to reviewing NPAs.

2. The reliability and supply impacts are described in the Company's response to Question 1 above.

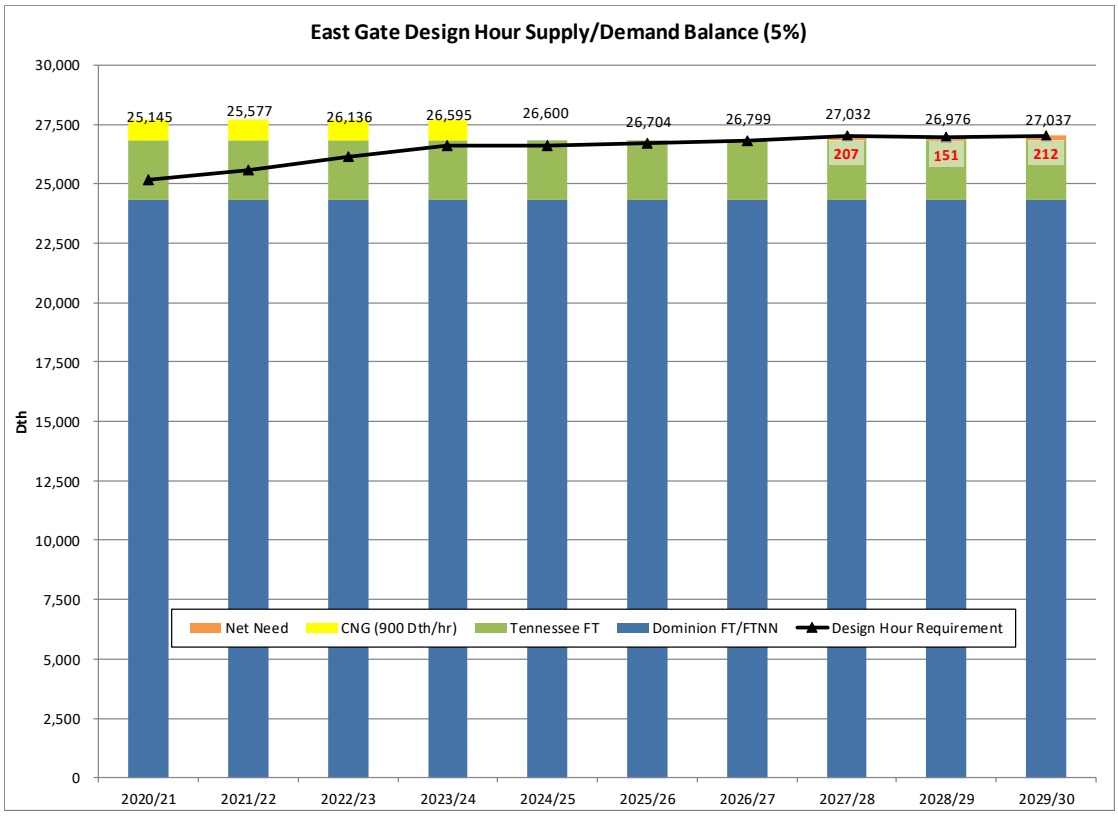
   No design-day supply shortfalls are forecast to occur over the ten-year forecast; however, there is a design-hour shortfall beginning in the winter of 2027/28 based on the demand forecast filed in this rate filing. Impacts to the East Gate supply generally will affect the Capital Region and may manifest at one or more Gate Stations, depending on the scenario. Impacts to the Troy Gate Station generally will affect customers in Troy and the immediately surrounding area. Because there are no forecast supply shortfalls in the next several years, the Company has not evaluated the need for, or impact of, a potential moratorium on new service connections (and would consider alternative supply and demand solutions in the first place).

3. Please see the chart below for a ten-year supply/demand design-day forecast for core customers based on the gas load forecast filed in the Gas Supply Panel's direct testimony.



As shown above, there is no design-day shortfall over the ten-year forecast, and thus the Company has no major capital projects planned to meet forecast demand. The Albany Loop Project does not provide incremental supplies to the system. It does, however, increase the Company's ability to take in supplies from the Tennessee Gas Pipeline ("TGP"). If incremental firm supplies are required from TGP in the future, the Company would need to pursue a contract with TGP separately, and any associated pipeline modifications would need to be completed under a separate project.

4. Please see the chart below for a ten-year peak-hour (design-hour) supply/demand chart for firm East Gate customers based on the gas load forecast filed in the Gas Supply Panel's direct testimony.



The chart above reflects the East Gate design-hour supply/demand balance based on a 5% peak hour and shows a shortfall beginning in the winter of 2027/28.

Name of Respondent:
Owen Brady-Traczyk
MaryBeth Carroll
Peter Metzdorff

Date of Reply:
October 5, 2020

Date of Request: September 24, 2020 Request No. DPS-768
Due Date: October 5, 2020 NMPC Req. No. NM-936

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Davide Maioriello

TO: National Grid, Future of Heat & Gas Infrastructure and Operations Panel

SUBJECT: Transmission Service Removal Program

Request:

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

On page 62 of the Direct Testimony of the GIOP, the Company describes the Transmission Services Removal Program details:

1. What type and size of customers remain to be converted over to the proposed distribution main extension? List the number of customers by type and service class.

2. Has the Company considered implementing a non-pipes alternative (NPA) instead of the proposed 10.1 mile new gas distribution main? If so, provide details of what has been considered to date and why it has not been proposed in this proceeding or elsewhere. If an NPA has not been considered, explain why not.

3. Are the existing customers providing any contribution in aid of construction payments to offset any gas main or service line costs beyond their original entitlements to remove cost subsidies from firm customer?

Response:

1. Currently there are 201 residential and 11 commercial services remaining to be converted.

2. The Company did not consider non-pipeline alternatives to this program. The Company currently is working on developing protocols to evaluate alternatives to traditional gas infrastructure projects, such as service replacements and LPP removal.

3. No. Unless a customer subsequently requests modifications or expansions to its existing service, contributions in aid of construction ("CIAC") are only collected at the time of initial construction. Existing customers do not provide a CIAC towards the Company's costs to operate, maintain, or replace an existing service once installed.

Name of Respondent:
Saadat Khan

Date of Reply:
October 5, 2020

Date of Request: October 1, 2020 Request No. DPS-804
Due Date: October 13, 2020 NMPC Req. No. NM-1042

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Michael Pasinella, William Koch, and Steven DiLillo

TO: National Grid, Gas Safety Panel

SUBJECT: High Emitter Methane Detection

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

On pages 36 through 37 of the Direct Testimony of the Gas Safety Panel, the Company discusses its high emitter methane detection program.

1. How did the Company determine the proposed two full-time equivalent (FTE) positions? Provide any supporting documentation and/or evidence.

2. Will the requested FTE positions have job duties other than those related to the high emitter methane detection program? If so, describe the duties.

Response:

1. It is estimated that the Company will need to repair 50 additional leaks per year discovered through this process. The average leak repair time is 53 hours and therefore the total hours needed to repair 50 leaks is 2,650. An average FTE can work approximately 2,080 hours (52 weeks x 40 hours per week) including non-productive time (*i.e.*, vacation, holiday, sick, and training time); however, average FTE productive time available is approximately 1,600 hours. Based on this information, it was determined that approximately two incremental FTEs will be required to repair the 50 additional high emitter leaks per year.

2. As stated in the Company's response to Question 1, the FTEs requested were based on the anticipated increase in workload. Although these FTEs may perform other gas construction duties for which they are qualified, their primary tasks are to support the increase in repairing high emitter leak repairs discovered.

Name of Respondent: Date of Reply:
Saadat Khan October 12, 2020

Date of Request: October 2, 2020 Request No. DPS-824
Due Date: October 13, 2020 NMPC Req. No. NM-1062

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Michael Pasinella, William Koch, and Steven DiLillo

TO: National Grid, Gas Safety Panel

SUBJECT: Damage Prevention Enhancements

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

On pages 25 through 31 of the Direct Testimony of the Gas Safety Panel, the Company discusses its damage prevention enhancements program.

1. How will the addition of one full-time equivalent (FTE) position increase the percentage of the riskiest one-call tickets visited daily from what it is currently 7%, to the proposed goal of at least 25%?

2. Describe the "Urbint risk algorithm" and how it differs from what the Company currently utilizes.

3. How did the Company determine the need for the requested FTE position? Provide any supporting documentation or evidence.

4. Will the FTE position have job duties other than those needed to address damage prevention enhancements? If so, describe the duties.

Response:

1. The requested FTE would manage the additional Damage Prevention Advisors Program contractors and also visit high risk sites to help reduce damages. This management and availability of additional resources will help to increase the percentage of the riskiest one-call tickets visited daily.

2. The Urbint risk algorithm uses artificial intelligence ("AI") to risk rank each one-call ticket. The system provides a risk score based on several factors, including excavator damage history, type of construction, location, previous damages root causes, mismarks, no-calls data, and other AI items. Urbint provides a greater ticket risk assessment when

compared to Opvantek (previous vendor), which only provided ticket risk score analysis based on third-party excavator errors.

3. The Company requested the additional Damage Prevention Supervisor based on a review of available resources and the need to perform or address the following in the Rate Year and Data Years:

   a. the increase in one call ticket volume and third party damages;

   b. the need for the Damage Prevention group to respond to more damages;

   c. the need to provide education to third party excavators and repeat-offenders to reduce the risk of excavation damage to the Company's facilities;

   d. to oversee the increase in locating technicians in addition to the increase in the number of Damage Prevention Advisors needed to enhance the Ticket Risk Assessment program to ensure the Company has the field resources to visit up to 25% of the riskiest one-call tickets daily; and

   e. to conduct damage investigations.

4. The FTE's primary roles and responsibilities will be to perform or address the items listed in the Company's response to Question 3 above.

Name of Respondent:
John Fiume

Date of Reply:
October 12, 2020

Date of Request: October 2, 2020 Request No. DPS-827
Due Date: October 13, 2020 NMPC Req. No. NM-1065

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Michael Pasinella, William Koch, and Steven DiLillo

TO: National Grid, Gas Safety Panel

SUBJECT: IMP for Pipelines Operating Above 124 PSIG

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

On pages 38 through 40 of the Direct Testimony of the Gas Safety Panel, the Company discusses its voluntary integrity management (IMP) for pipelines operating above 124 pounds per square-inch gauge (PSIG) program.

1. Specify which pipelines segments, including total mileage, will be addressed in the following years:

   a. Rate Year;
   b. Data Year one;
   c. Data Year two; and
   d. The 12-month period following the end of Data Year two.

2. How were the pipeline segments, identified in response to question 1, selected for each of the years identified in question 1, above?

3. How were the associated costs forecasted for each of the years identified in question 1, above? Provide any supporting documentation or evidence.

Response:

1. a.-d. The Company plans to perform ECDA (External Direct Assessment) on approximately 11 miles of pipeline per year. The individual pipeline segments that will be addressed annually have not been identified at this time but will be identified as part of the ramp up period in FY 2022. Inspections will begin in FY 2023.

2. Pipeline segments will be identified using the following screening criteria:

- Operating stress of the pipeline (SYMS)
- Pipelines installed prior to 1980
- Pipelines with a MAOP > 200 psig
- Population along the pipeline route
- New Probabilistic risk model results

3. The Company used the data and past costs from its mandated IMP program to forecast costs for this program. The units of work planned are based on resources and the average number of excavations/repairs seen in the mandated program. The forecast is included as Attachment 1. Please note the updated forecast is lower than currently reflected in the revenue requirement by $0.544 million, $0.012 million, and $0.011 million in the Rate Year, Data Year 1, and Data Year 2, respectively.

Name of Respondent:
Michael Kern

Date of Reply:
October 12, 2020

Niagara Mohawk Power Corporation
d/b/a National Grid
Cases 20-E-0380 and 20-G-0381
DPS-827 Attachment 1
Page 1 of 1

$	Task	Quantity		Unit Price	Extended Amount Yr1
Annual O&M Inspection – Labor	ECDA	11 Miles	11 miles per year	$10,000 per mile	$110,000
Direct Inspection / Examination (Excavation)	Excavate/ Inspect/ Restore	33	3 excavations per mile	$19,871 per excavation	$655,738
OPEX Remediations	Install Composite Repair	11 Repairs	1/3 require repair	$6,487 per repair	$71,358
TOTAL OPEX					$837,096

	FY21	FY22	FY23	FY24	FY25
Annual O&M Inspection – Labor	-----	----	$110,000	$112,750	$115,569
Direct Inspection / Examination (Excavation)	----	----	$655,738	$672,130	$688,934
OPEX Remediations	----	----	$71,358	$73,143	$74,971
TOTAL OPEX	-	-	$837,096	$858,023	$879,474

		Rate Year Ending June 2022	Rate Year Ending June 2023	Rate Year Ending June 2024
TOTAL OPEX		$ 209,274	$ 842,328	$ 863,386

Note: 2.5% Inflation Factor -FY24,25

Date of Request: October 20, 2020 Request No. DPS-985
Due Date: October 30, 2020 NMPC Req. No. NM-1342

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Richard George

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: GIOP Capital Expenditures - Customer Connections Category

Request:

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

Exhibit___(GIOP-1) shows Actual and Projected Direct Capital Expenditures for the Historic Test Year and April 1, 2020 – March 31, 2025 (FY 2021 – FY 2025). For the following projects/programs under the Customer Connections category: (1) Customer Connections - Install Services; (2) Customer Connections - Install Main; (3) Gas System Reinforcement; (4) Customer Connections – Fitting; and (5) Customer Connections - Install Meter/Regulator:

1. Provide sanction papers that identify each project/program, or related projects/programs, and their cost breakdown, financials, milestones, management approval, any key appendices, and any other relevant information used to justify the Company's conclusion that it chose the best solution.

2. Provide a detailed description for each project/program, if not included in the sanction paper documents.

3. Provide a detailed description and explanation of the planned phasing for this project/program, including the scope of work for each phase, the schedule of each phase by year, and the budgets of each phase.

4. Provide the estimated cost and quantity of work by appropriate unit cost item or service agreement.

5. Provide the benefit cost analysis for each project/program supporting the Company's plan to pursue the project/program.

6. Provide a description of how the Company developed the budgeted project/program cost for both capital and operating expenses for each year through FY 2025 related to each project/program. This should include any relevant information on individual vendor quotes received for estimating project/program costs. Include all supporting workpapers and calculations.

7. Explain whether the Company's Rate Year forecast includes any type of savings associated with implementing each project/program.

    a. If so, identify how much savings were forecast and identify where these savings are shown in the Rate Year forecast, and how the savings were calculated.

    b. If not, explain why the Company believes that no savings will be realized in the Rate Year.

    c. If not, does the Company forecast any type of savings associated with implementing each project/program in either of Data Year 1 or Data Year 2? If so, provide the forecast and explain how it was calculated. If not, explain why not.

8. State whether project/program implementation related to each project/program that has already been commenced is on track with the forecasted schedule. Explain any variances.

9. Explain how the project/program compares to industry-wide best practices.

Response:

Unless otherwise specified in the response, the Company's responses below apply to Customer Connections Categories 1-5.

1. Sanction papers for these projects and programs are not currently available. Projects and blanket programs for fiscal year ("FY") 2022 will not undergo sanctioning until the fourth quarter of FY 2021 and any specific projects will be sanctioned prior to project commencement. Sanction papers for programs/blankets are submitted annually during the fourth quarter of the preceding fiscal year and are typically approved prior to the start of the first quarter of the next fiscal year. Specific project sanction papers are submitted once spending levels have been established and the project is scheduled to start.

    Support for these projects, including alternatives reviewed and the Company's rationale for selecting a specific project or program, is provided in the whitepapers in Exhibit __ (GIOP-4).

2. Program and projects descriptions are provided in the whitepapers provided in Exhibit __ (GIOP-4).

3. Detailed phased plans for the Rate Year are not available at this time. Programs/Blankets are phased based on historical spend during the work plan cycle, which takes place in the fourth quarter of the previous fiscal year. Specific projects have custom schedules that are phased as they reach certain gate stages of development in the sanction process.

4. Please see Attachment 1.

5. Specific cost benefits analyses were not performed for these projects and programs. The costs and benefits of the projects and programs were included in the whitepapers in Exhibit __ (GIOP-4).

6. Please see Attachment 1.

7. Where the historical/unit costs are utilized to forecast a project or program, the Rate Year forecast has embedded any savings, or conversely any increases, in those costs. As these costs were already embedded, the Company is unable to break out cost details to show specific savings. For specific projects, detailed savings projects are only available once a project reaches applicable gate stages of the sanction process.

8. The Company's spend and implementation of programs/blankets are based on the Company's fiscal year cycle and will not commence until April 1, 2022. For specific projects, pre-engineering work for multi-year projects may commence prior to FY 2022.

9. The Company participates in various industry-wide forums through the American Gas Association, Natural Gas Supply Association, Northeast Gas Distribution Council, and other trade associations. Although the Company supplies information for best practice surveys and review results, because of variables within the service territory (*e.g.*, regional requirements, urban areas, etc.), the Company has not analyzed and compiled the results of such surveys at a level that directly ties to a particular project or program within these categories of the Customer Connections portfolio.

Name of Respondent:
Patricia McVeigh

Date of Reply:
October 30, 2020

DPS 985		
	4. Provide the estimated cost and quantity of work by appropriate unit cost item or service agreement.	**6. Provide a description of how the Company developed the budgeted project/program cost for both capital and operating expenses for each year through FY 2025 related to each project/program. This should include any relevant information on individual vendor quotes received for estimating project/program costs. Include all supporting workpapers and calculations.**
Customer Connections - Install Services	See Schedule A	Historical average with applied rate of inflation
Customer Connections - Install Main	See Schedule A	Historical average with applied rate of inflation
Gas System Reinforcement	See detailed spreadsheet for individual job descriptions/estimates within program utilizing best available unit cost data or cost book data at the time Schedule B	See detailed spreadsheet for individual job descriptions/estimates within program utilizing best available unit cost data or cost book data at the time Schedule B
Customer Connections - Fitting	See Schedule A	Historical average with applied rate of inflation
Customer Connections - Install Meter/ Regulator	See Schedule A	Historical average with applied rate of inflation

Current Unit UC Calculations

			FY21	FY22	FY23	FY24	FY25
Customer Connections - Install Main							
FY19 Unit Cost	$	55					
Inflated to FY21	$	57	$ 7,653,383				
Inflated to FY22	$	61		$ 6,732,164			
Inflated to FY23	$	62			$ 8,181,532		
Inflated to FY24	$	63				$ 8,371,028	
Inflated to FY25	$	65					$ 8,515,047
FY21 Units		133716					
Inflated to FY22 and adjusted for economic trend		110858					
Inflated to FY23		131915					
Inflated to FY24		132195					
Inflated to FY25		131677					
Customer Connections - Install Services							
3 Year Average (FY17-19) - Inflated (Unit Cost)	$	4,152					
Inflated to FY21	$	4,327	$ 9,784,219				
Inflated to FY22	$	4,504		$ 9,743,418			
Inflated to FY23	$	4,600			$ 10,763,478		
Inflated to FY24	$	4,697				$ 11,185,689	
Inflated to FY25	$	4,796					$ 11,618,970
FY21 Units		2261					
Inflated to FY22 and adjusted for economic trend		2163					
Inflated to FY23		2340					
Inflated to FY24		2382					
Inflated to FY25		2423					
Customer Connections - Customer Contributions							
3 Year Average (FY17-19) - Inflated	$	(1,868,008)					
Inflated to FY21	$	(1,946,464)	$ (1,946,464)				
Inflated to FY22 and adjusted for economic trend	$	(1,788,606)		$ (1,788,606)			
Inflated to FY23	$	(2,029,670)			$ (2,029,670)		
Inflated to FY24	$	(2,072,293)				$ (2,072,293)	
Inflated to FY25	$	(2,116,226)					$ (2,116,226)

Exhibit ___ (GIOP-11R)
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		FY21	FY22	FY23	FY24	FY25
Customer Connections - Fitting						
3 Year Average (FY17-19) - Inflated	$ 5,216,004					
Inflated to FY21	$ 5,435,077	$ 5,435,077				
Inflated to FY22 and adjusted for economic trend	$ 4,994,292		$ 4,994,292			
Inflated to FY23	$ 5,667,411			$ 5,667,411		
Inflated to FY24	$ 5,786,427				$ 5,786,427	
Inflated to FY25	$ 5,909,099					$ 5,909,099
Customer Connections - Install Meter / Regulator						
3 Year Average (FY17-19) - Inflated	$ 2,955,718					
Inflated to FY21	$ 3,079,858	$ 3,079,858				
Inflated to FY22 and adjusted for economic trend	$ 2,830,082		$ 2,830,082			
Inflated to FY23	$ 3,211,514			$ 3,211,514		
Inflated to FY24	$ 3,278,955				$ 3,278,955	
Inflated to FY25	$ 3,348,469					$ 3,348,469
CSC/Public Works						
3 Year Average (FY17-19) - Inflated	$ 6,378,361					
Inflated to FY21	$ 6,646,253	$ 6,646,253				
Inflated to FY22	$ 6,918,749		$ 6,918,749			
Inflated to FY23	$ 7,066,118			$ 7,066,118		
Inflated to FY24	$ 7,214,507				$ 7,214,507	
Inflated to FY25	$ 7,367,454					$ 7,367,454
Main Replacement (Proactive) - Leak Prone Pipe						
FY19 Unit Cost	$ 232					
Inflated to FY21	$ 246	$ 59,942,061				
Inflated to FY22	$ 268		$ 58,265,759			
Inflated to FY23	$ 276			$ 67,296,951		
Inflated to FY24	$ 284				$ 69,315,860	
Inflated to FY25	$ 292					$ 71,395,336

Exhibit ___ (GIOP-11R)
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		FY21	FY22	FY23	FY24	FY25
FY21 Units	244094					
FY22 Units and adjusted for economic trend	217677					
FY23 Units	244094					
FY24 Units	244094					
FY25 Units	244094					
Main Replacement (Reactive) Maintenance						
3 Year Average (FY17-19) - Inflated	$ 904,989					
Inflated to FY21	$ 942,998	$ 942,998				
Inflated to FY22	$ 962,801		$ 962,801			
Inflated to FY23	$ 983,309			$ 983,309		
Inflated to FY24	$ 1,003,958				$ 1,003,958	
Inflated to FY25	$ 1,025,242					$ 1,025,242
Service Replacement (Reactive) - Leaks						
3 Year Average (FY17-19) - Inflated	$ 3,179,376					
Inflated to FY21	$ 3,312,910	$ 3,312,910				
Inflated to FY22	$ 3,382,481		$ 3,382,481			
Inflated to FY23	$ 3,454,528			$ 3,454,528		
Inflated to FY24	$ 3,527,073				$ 3,527,073	
Inflated to FY25	$ 3,601,847					$ 3,601,847
Service Replacement (Reactive) - Non-Leaks/Other						
3 Year Average (FY17-19) - Inflated	$ 6,028,544					
Inflated to FY21	$ 6,281,743	$ 6,281,743				
Inflated to FY22	$ 6,413,660		$ 6,413,660			
Inflated to FY23	$ 6,550,271			$ 6,550,271		
Inflated to FY24	$ 6,687,826				$ 6,687,826	
Inflated to FY25	$ 6,829,608					$ 6,829,608

Reinforcement and Reliability Program

FY	Town	Description	Unit Cost	Estimated Cost	Project Type	Length1	Length2	Length3	MAOP	Main Connections	Service Counts	Cast Iron Footage	Affected Customers (Design Day)
2021	Watervliet	Make a LP connection at the intersection of 5th Ave and 19th St using 45 ft of 6" main	$237	$21,294	New Main	45			LP	2	0	0	116
2021	Albany	Install 400 ft of 6" of 24 psig main on Robin St between Washington Ave and State St	$237	$94,640	New Main	400			24	2	0	0	68
2021	Schenectady	Install 1,300 ft of 4" 32 psig main on Bradley Blvd between Mc Clellan St and N Elm St and make tie-ins at Furman St and Division St. Transfer all trhe LP customers on new MP and retire the LP main.	$246	$319,241	Load Shed	1300			32	4	24	148	242
2021	Albany	Install 3,200 ft of 4" 24 psig main on Hendrick Ave, Amsterdam Ave, Peal St and Wolfert St. Install 500 ft of 2" 24 psig on Highland St, 750 ft of 2" 24# main om Hampton St and 880 ft of 2" 24 psig main on Pawling St. Transfer LP customers on the new MP main. Retire the LP main.	$246	$1,308,888	Load Shed	3200	2130		24	3	100	1844	249
2021	Albany	Install 850 ft of 6" 24 psig main on California Ave and Central Ave,	$246	$1,058,407	Load Shed	850	1730	1730	24	4	80	2797	312
2021	Albany	Install 200 ft of 8" 45 psig of main on Magazine St from Maplewood Ave and Western Ave. Install 1,450 ft of 2" 45 psig main on Tudor Rd. Transfer all LP customers to MP. Retire the LP main.	$246	$405,191	Load Shed	200	1450		45	1	30	307	18
2021	Albany	Install 1,450 ft of 4" main on Cortland Ave, W Lawrence Ave and Bancker St between Allen St and S main Ave	$246	$356,077	Load Shed	1450			24	2	40	921	254
2021	Rotterdam	Install 200 ft of 6" LP main to loop existing 2" LP main on Butler Ln west of Hamburg St	$237	$47,320	New Main	200			LP	2	0		24
2021	Altamont	Install 13640 ft of 8in main on State Rt 146 and Western Ave and connect to the 45 main south of Interconnect valve #6177. OR Uprate existing 32# main on State Rt 146 and Western Ave till interconnect valve to 45#. Move the Valve to north of Hartmans Corner.	Project Graded	$500,000	New Main				45	2	0	0	767
2021	Rexford	Install 9500 ft of 124# 12" ST main on Rt 146. Install a new Regulator station 124# to 45#. Install 4420 ft of 16" 45# main on Rt 146 from the new Reg to Ballston Lake Rd	Project Graded	$2,300,000					45	2	0	0	
2021	Schenectady	PL E-36 Uprate	Project Graded	$1,560,722	Uprate								-
2021	Watertown	Make a tie-in on Bronson St just east of High St using 12" main	$1,422	$71,100	New Main	50			22	2	0	0	1978
2021	Skaneateles	Install 900 ft of 6" 15 psig main on Jewett Rd east of Route 321 Rd to connect the existing mains	$237	$212,940	New Main	900			15	2	0	0	356
2021	Bridgeport	Install 380 ft of 4" 24 psig main on Shackelton Point Rd east of Pierce Rd till Shore Lawn Dr. Install 580 ft of 4" 24 psig main on Shackelton Point Rd from east of Shore Lawn Dr and connect the existing mains	$237	$227,136	New Main	960			24	4	0	0	57
		Carry Over Projects		$1,717,045									-
				$10,200,000									
2022	Altamont	Install 13640 ft of 8in main on State Rt 146 and Western Ave and connect to the 45 main south of Interconnect valve #6177. OR Uprate existing 32# main on State Rt 146 and Western Ave till interconnect valve to 45#. Move the Valve to north of Hartmans Corner.	Project Graded	$6,000,000	New Main	13,640			45	2	0	0	
2022	Hanagan	Install 300 ft of 4" 28 psig main on Northern Blvd from Pawling St and Church St	$245	$73,500	New Main	300			28	2	0	0	

Reinforcement and Reliability Program

FY	Town	Description	Unit Cost	Estimated Cost	Project Type	Length1	Length2	Length3	MAOP	Main Connections	Service Counts	Cast Iron Footage	Affected Customers (Design Day)
2022	Cohoes	Install 680 ft of 4" 24 psig main on James St from Krug St and Jefferson Ave. Pressure test 578 ft of plastic main on Montgomery St and Jefferson St. Install 360 ft of 2" 24 psig main on Jefferson Ave (East of James St). Transfer approximately 20 LP customers on MP. Only Retire LP main on Jefferson Ave.	$268	$433,090	Load Shed	680	360	578	24	1	20	0	
2022	Albany	Install 240 ft of 4" main on Ryckman Ave and 160 ft of 2" main on Mercer St. Retire the LP main on Ryckman Ave. Transfer approx. 6 LP customers on MP. (CI footage: 342 ft)	$268	$107,068	Load Shed	240	160		24	3	6	342	
2022	Albany	Install 500 ft of 8" LP main on New Scotland Rd and Normanside Dr and connect to the existing mains	$245	$122,500	New Main	500			LP	2		0	
2022	Pennelville	Install 8,700 ft of 12" 24 psig on County Hwy 12 and connect the existing 8" mains on County Hwy 12 and Oneida River Rd	Project Graded	$2,700,000	New Main	8700			24	2	0	0	
				$9,436,158									
2023	Amsterdam	Make a tie-in on Brookside Ave just north of Elias St using a 4" 28 psig main	$253	$25,300	New Main	50			28	2	0	0	
2023	Wilton	Install 4,200 ft of 6" 45 psig main on Ballard Rd from North Rd to existing main on Ballard Rd	$253	$1,062,600	New Main	4200			45	2	0	0	
2023	Rotterdam	Install 2,600 ft of 8" of 32 psig main on Lilac St, Evergreen St, Tulip St and Guilderland Ave. Install 350 ft of 2" main on Tulip St between Lawn Ave and Evergreen St. Install 580 ft of 2" of 2" main on Evergreen Ave between Tulip St and Pansy St. Install 600 ft of 4" main on Pansy St between Lawn Ave and Arbor Ave. Install 580 ft of 4" main on Arbor Ave from Tulip St and Pansy St. Transfer approximately 55 LP customers to MP. Retire the LP main on Evergreen Ave, Pansy St, Tulip St (between Lawn Ave and Evergreen St) and Arbor Ave (between Tulip St and Pansy St).	$276	$1,298,547	Load Shed/ New Main	2600	1180	930	32	4	55	0	
2023	Rexford	Rt 146	Project Graded	$70,000									
2023	Schenectady	Install 3,000 ft of 8" 32 psig main on Barrett St, Liberty St, Notter Ave and Eastern Ave. Retire the LP main on Barrett St and transfer about 10 LP customers to MP.	$253	$806,520	Load Shed/ New Main	3000			32	2	10	217	
2023	Black River	Install 5,000 ft of 8" 60 psig main on State Route 342 from existing main on NY State Route 3 to 4" main on Howe St (with a future possibility of extending the main to Leray St).	Project Graded	$2,250,000	New Main	5000			60	2	0	0	
2023	Central Square	Install 700 ft of 4" 24 psig main on Summerhill Dr from existing main on south of State Hwy 49 to Green Acres Dr	$253	$177,100	New Main	700			24	2	0	0	
		LP		$3,000,000									
				$8,690,067									
2024	Schuykerville	Install 250 ft of 2" 19 psig main on Clancy St from County Hwy 336 to the existing main on Clancy St	$262	$65,500	New Main	250			24	2	0	0	
2024	Albany	Install 260 ft of 8" 24 psig main on Central Ave just south of Reber St and connect the existing main on Central Ave	$262	$68,120	New Main	260			24	2	0	0	

Reinforcement and Reliability Program

FY	Town	Description	Unit Cost	Estimated Cost	Project Type	Length1	Length2	Length3	MAOP	Main Connections	Service Counts	Cast Iron Footage	Affected Customers (Design Day)
2024	Rensselaer	Install 3,100 ft of 6" 24 psig main on Bloominggrove Dr, Green Hill Rd and Snyders Lake Rd from the existing 6" main north of Teliska Ave. Make intermediate tie-ins at Sitzmark Ln and Lape Rd.	$262	$812,200	New Main	3100			24	3	0	0	
2024	Albany	Make a tie-in using a 4" 24 psig at the intersection of Hansen Ave and Ryckman Ave	$262	$26,200	New Main	50			24	2	0	0	
2024	Albany	Make a tie-in using a 2" 24 psig at the intersection of Partridge St and Central Ave	$262	$26,200	New Main	50			24	2	0	0	
2024	Albany	Install 650 ft of 2" 24 psig main on Colonie Plaza Dr (Near Price Chopper Super Center)	$262	$170,300	New Main	650			24	2	0	0	
2024	Various	MP Projects TBD (Central)		$1,000,000									
2024	Various	**LP**		$3,000,000									
				$5,168,520									
2025	Various	MP Projects TBD (Central)		$1,000,000									
2025	Rotterdam	Install 4,500 of 8" main on Hamburg St from Abbottsford Rd and make tie-ins at Cladicott Rd, Chepstow Rd, Carleon Rd and Cardiff Rd. Install 1,300 ft of 6" main on Christler Ave and Tower Rd from Hamburg St.	$271	$1,571,800	New Main	4500	1300		32	6	0	0	
		LP		$3,000,000									
				$5,571,800		67525	12730	3238				6576	
						83493							

FY	Town	Project	Unit Cost	New Estimate	# of Customers Affected
2021	Colonie	Install a RCV and Flow Control Valve at Wolf Gate Station (Construction))	Project Graded	$3,347,328	
2021	Albany	Upgrade LP main to MP to retire Regulator Station at Maple		$200,000	
		Install RCV at valve V-5201 Velasko Rd & Onondaga Blvd	Project Graded	$419,000	
2021	Rotterdam	Install 3000' of 12" plastic on Duanesburg Rd from Keller Ave to Rotterdam St. (a portion of this main will either need to be strung on the bridge, or drilled under 4 train tracks)	Project Graded	$3,420,705	17571
		Engineering		$ -	
				$ 7,387,033	

2022	Rensselaer	924-302B Ferry St and 924-346 2nd Ave - 9,132 ft of main (Steel: 3,175 ft, Plastic: 3,407 ft, CI and BS: 2,550) and 188 customers	$268	$1,222,181	Isolated LPP
2022	Amsterdam	924-812 Edson St - 9,222 ft of main (Steel: 3,654 ft, Plastic: 2,722 ft, CI and BS: 2,846) and 178 customers	$268	$1,234,226	Isolated LPP
2022	Rotterdam	Burdeck Gate Station or Valve #401-71	Cost Book	$ 113,214	RCV
		Engineering			
				$ 2,569,621	

Exhibit ___ (GIOP-11R)
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Reinforcement and Reliability Program

FY	Town	Description	Unit Cost	Estimated Cost	Project Type	Length1	Length2	Length3	MAOP	Main Connections	Service Counts	Cast Iron Footage	Affected Customers (Design Day)
2023	Rensselaer	924-302B Ferry St and 924-346 2nd Ave - 9,132 ft of main (Steel: 3,175 ft, Plastic: 3,407 ft, CI and BS: 2,550) and 188 customers	$276	$1,258,846	Isolated LPP								
2023	Amserdam	924-812 Edson St - 9,222 ft of main (Steel: 3,654 ft, Plastic: 2,722 ft, CI and BS: 2,846) and 178 customers	$276	$1,271,253	Isolated LPP								
2023	Glenmont	Install 3800 ft of 12" main from existing main on Kenwood Ave to outlet of GRS 924-348	Project Graded	$1,900,000	Loss of GRS 340 (15575 Customers)								
		Engineering											
				$ 4,430,099									
2024	Troy	924-539 Brookview Avenue - 10,551 ft of main (Steel:4,427 ft, Plastic: 2,213 ft, CI and BS: 3,911) and 173 customers	$284	$1,498,084									
2024	Albany	924-349 Lodge St - 10,037 ft of main (Steel:693 ft, Plastic: 2,073 ft, CI and BS: 7,271) and 59 customers	$284	$1,425,103	Isolated LPP								
2024	Oneida	Install one valve at Oneida Regulator Station feed to Rome	Cost Book	$2,184,451	RCV								
		Engineering											
				$ 5,107,639									
2025	Troy	924-539 Brookview Avenue - 10,551 ft of main (Steel:4,427 ft, Plastic: 2,213 ft, CI and BS: 3,911) and 173 customers	$292	$1,543,031									
2025	Albany	924-349 Lodge St - 10,037 ft of main (Steel:693 ft, Plastic: 2,073 ft, CI and BS: 7,271) and 59 customers	$292	$1,467,861	Isolated LPP								
2025	Phoenix	At Biddlecum Gate Station	Cost Book	$2,228,140	RCV								
		Engineering											
				$ 5,239,032									

Exhibit ___ (GIOP-11R)
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Date of Request: October 20, 2020 Request No. DPS-986
Due Date: October 30, 2020 NMPC Req. No. NM-1343

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Richard George

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: GIOP Capital Expenditures - Mandated Category

Request:

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

Exhibit___(GIOP-1) shows Actual and Projected Direct Capital Expenditures for the Historic Test Year and April 1, 2020 – March 31, 2025 (FY 2021 – FY 2025). For the following projects/programs under the Customer Connections category: (1) Main Replacement (Proactive) - Leak Prone Pipe; (2) Pipeline Integrity IMP (Integrity Management Program); (3) Pipeline Integrity IVP - PL 16 HCA Sections - Orange Commons; (4) Transmission Station Integrity; (5) CSC/Public Works - Non-Reimbursable, (6) Purchase Meters (Replacements); (7) Service Replacements (Reactive) - Non-Leaks/Other; and (8) Pipeline Integrity IVP (Integrity Verification Program):

1. Provide sanction papers that identify each project/program, or related projects/programs, and their cost breakdown, financials, milestones, management approval, any key appendices, and any other relevant information used to justify the Company's conclusion that it chose the best solution.

2. Provide a detailed description for each project/program, if not included in the sanction paper documents.

3. Provide a detailed description and explanation of the planned phasing for this project/program, including the scope of work for each phase, the schedule of each phase by year, and the budgets of each phase.

4. Provide the estimated cost and quantity of work by appropriate unit cost item or service agreement.

5. Provide the benefit cost analysis for each project/program supporting the Company's plan to pursue the project/program.

6. Provide a description of how the Company developed the budgeted project/program cost for both capital and operating expenses for each year through FY 2025 related to each project/program. This should include any relevant information on individual vendor quotes received for estimating project/program costs. Include all supporting workpapers and calculations.

7. Explain whether the Company's Rate Year forecast includes any type of savings associated with implementing each project/program.

    a. If so, identify how much savings were forecast and identify where these savings are shown in the Rate Year forecast, and how they were calculated.

    b. If not, explain why the Company believes that no savings will be realized in the Rate Year.

    c. If not, does the Company forecast any type of savings associated with implementing each project/program in either of Data Year 1 or Data Year 2? If so, provide the forecast and explain how it was calculated. If not, explain why not.

8. State whether project/program implementation related to each project/program that has already been commenced is on track with the forecasted schedule. Explain any variances.

9. Explain how the project/program compares to industry-wide best practices.

Response:

Unless otherwise specified in the response, the Company's responses below apply to all categories identified in DPS Staff's question.

1. Sanction papers for these projects and programs are not currently available. Projects and blanket programs for fiscal year ("FY") 2022 will not undergo sanctioning until the fourth quarter of FY 2021 and any specific projects will be sanctioned prior to project commencement. Sanction papers for programs/blankets are submitted annually during the fourth quarter of the preceding fiscal year and are typically approved prior to the start of the first quarter of the next fiscal year. Specific project sanction papers are submitted once spending levels have been established and the project is scheduled to start.

    Support for these projects, including alternatives reviewed and the Company's rationale for selecting a specific project or program, is provided in the whitepapers in Exhibit __ (GIOP-4).

2. Program and projects descriptions are provided in the whitepapers provided in Exhibit __ (GIOP-4).

3. Detailed phased plans for the Rate Year are not available at this time. Programs/Blankets are phased based on historical spend during the work plan cycle, which takes place in the fourth quarter of the previous fiscal year. Specific projects have custom schedules that are phased as they reach certain gate stages of development in the sanction process.

4. Please see Attachment 1.

5. Specific cost benefits analyses were not performed for these projects and programs. The costs and benefits of the projects and programs were included in the whitepapers in Exhibit __ (GIOP-4).

6. Please see Attachment 1.

7. Where the historical/unit costs are utilized to forecast a project or program, the Rate Year forecast has embedded any savings, or conversely any increases, in those costs. As these costs were already embedded, the Company is unable to break out cost details to show specific savings. For specific projects, detailed savings projects are only available once a project reaches applicable gate stages of the sanction process.

8. The Company's spend and implementation of programs/blankets are based on the Company's fiscal year cycle and will not commence until April 1, 2022. For specific projects, pre-engineering work for multi-year projects may commence prior to FY 2022.

9. The Company participates in various industry wide forums through the American Gas Association, Natural Gas Supply Association, Northeast Gas Distribution Council, and other trade associations. Although the Company supplies information for best practice surveys and review results, because of variables within the service territory (*e.g.*, regional requirements, urban areas, etc.), the Company has not analyzed and compiled the results of such surveys at a level that directly ties to a particular project or program within these categories.

Name of Respondent:
Patricia McVeigh

Date of Reply:
October 30, 2020

DPS 986		
	4. Provide the estimated cost and quantity of work by appropriate unit cost item or service agreement.	**6. Provide a description of how the Company developed the budgeted project/program cost for both capital and operating expenses for each year through FY 2025 related to each project/program. This should include any relevant information on individual vendor quotes received for estimating project/program costs. Include all supporting workpapers and calculations.**
Main Replacement (Proactive) - Leak Prone Pipe	See Schedule A	Historical average with applied rate of inflation
Pipeline Integrity IMP (Integrity Management Program)	Individual estimates are based on actual cost for similar types of projects. Refer to Schedule B Exhibit 3 and Schedule C	Estimates based on historical actual costs for similar type projects
Pipeline Integrity IVP - PL 16 HCA Sections - Orange Commons	FY22--Project Development --1,000,000 FY23 --Design & Material Procumement --5,000,000 FY24 -- Construction 25,000,000 FY25 Project Close out --1,000,000	Estimates based on historical actual costs for similar type projects
Transmission Station Integrity	Full transmission station replacement: $4,030,000	This budgeted program cost is based on the federal rulemaking compliance that by July 2, 2035, the Company must attain 100 percent MAOP compliance for US DOT transmission assets. This budget assumes a target goal of 3 transmission station replacements / year through FY25. An individual transmission station replacement typically occurs over a four-year cycle whereas year 1 is project development at an estimated $200K, year 2 is design/procurement at an estimated $250K, year 3 is procurement/construction at an estimated $3.5M, and year 4 is project as-built/closeout at an estimated $80K. This budget includes a 2% inflation factor each year.
CSC/Public Works - Non-Reimbursable	See Schedule A	Historical average with applied rate of inflation
Purchase Meters (Replacements)	Refer to Schedule B Exhibit 1 & 2	The unit cost and forecasted costs incorporate historial averages of previous years. The Costs of purchasing meters
Service Replacements (Reactive) - Non-Leaks/Other	See Schedule A	Historical average with applied rate of inflation
Pipeline Integrity IVP (Integrity Verification Program)	Refer to Schedule B Exhibit 3	Estimates based on historical actual costs for similar type projects

Current Unit UC Calculations

		FY21	FY22	FY23	FY24	FY25
Customer Connections - Install Main						
FY19 Unit Cost	$ 55					
Inflated to FY21	$ 57	$ 7,653,383				
Inflated to FY22	$ 61		$ 6,732,164			
Inflated to FY23	$ 62			$ 8,181,532		
Inflated to FY24	$ 63				$ 8,371,028	
Inflated to FY25	$ 65					$ 8,515,047
FY21 Units	133716					
Inflated to FY22 and adjusted for economic trend	110858					
Inflated to FY23	131915					
Inflated to FY24	132195					
Inflated to FY25	131677					
Customer Connections - Install Services						
3 Year Average (FY17-19) - Inflated (Unit Cost)	$ 4,152					
Inflated to FY21	$ 4,327	$ 9,784,219				
Inflated to FY22	$ 4,504		$ 9,743,418			
Inflated to FY23	$ 4,600			$ 10,763,478		
Inflated to FY24	$ 4,697				$ 11,185,689	
Inflated to FY25	$ 4,796					$ 11,618,970
FY21 Units	2261					
Inflated to FY22 and adjusted for economic trend	2163					
Inflated to FY23	2340					
Inflated to FY24	2382					
Inflated to FY25	2423					

Customer Connections - Customer Contributions						
3 Year Average (FY17-19) - Inflated	$ (1,868,008)					
Inflated to FY21	$ (1,946,464)	$ (1,946,464)				
Inflated to FY22 and adjusted for economic trend	$ (1,788,606)		$ (1,788,606)			
Inflated to FY23	$ (2,029,670)			$ (2,029,670)		
Inflated to FY24	$ (2,072,293)				$ (2,072,293)	
Inflated to FY25	$ (2,116,226)					$ (2,116,226)
Customer Connections - Fitting						
3 Year Average (FY17-19) - Inflated	$ 5,216,004					
Inflated to FY21	$ 5,435,077	$ 5,435,077				
Inflated to FY22 and adjusted for economic trend	$ 4,994,292		$ 4,994,292			
Inflated to FY23	$ 5,667,411			$ 5,667,411		
Inflated to FY24	$ 5,786,427				$ 5,786,427	
Inflated to FY25	$ 5,909,099					$ 5,909,099
Customer Connections - Install Meter / Regulator						
3 Year Average (FY17-19) - Inflated	$ 2,955,718					
Inflated to FY21	$ 3,079,858	$ 3,079,858				
Inflated to FY22 and adjusted for economic trend	$ 2,830,082		$ 2,830,082			
Inflated to FY23	$ 3,211,514			$ 3,211,514		
Inflated to FY24	$ 3,278,955				$ 3,278,955	
Inflated to FY25	$ 3,348,469					$ 3,348,469
CSC/Public Works						
3 Year Average (FY17-19) - Inflated	$ 6,378,361					
Inflated to FY21	$ 6,646,253	$ 6,646,253				
Inflated to FY22	$ 6,918,749		$ 6,918,749			
Inflated to FY23	$ 7,066,118			$ 7,066,118		
Inflated to FY24	$ 7,214,507				$ 7,214,507	
Inflated to FY25	$ 7,367,454					$ 7,367,454

Exhibit __ (GIOP-11R)
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Main Replacement (Proactive) - Leak Prone Pipe

FY19 Unit Cost	$ 232					
Inflated to FY21	$ 246	$ 59,942,061				
Inflated to FY22	$ 268		$ 58,265,759			
Inflated to FY23	$ 276			$ 67,296,951		
Inflated to FY24	$ 284				$ 69,315,860	
Inflated to FY25	$ 292					$ 71,395,336
FY21 Units	244094					
FY22 Units and adjusted for economic trend	217677					
FY23 Units	244094					
FY24 Units	244094					
FY25 Units	244094					

Main Replacement (Reactive) Maintenance

3 Year Average (FY17-19) - Inflated	$ 904,989					
Inflated to FY21	$ 942,998	$ 942,998				
Inflated to FY22	$ 962,801		$ 962,801			
Inflated to FY23	$ 983,309			$ 983,309		
Inflated to FY24	$ 1,003,958				$ 1,003,958	
Inflated to FY25	$ 1,025,242					$ 1,025,242

Service Replacement (Reactive) - Leaks

3 Year Average (FY17-19) - Inflated	$ 3,179,376					
Inflated to FY21	$ 3,312,910	$ 3,312,910				
Inflated to FY22	$ 3,382,481		$ 3,382,481			
Inflated to FY23	$ 3,454,528			$ 3,454,528		
Inflated to FY24	$ 3,527,073				$ 3,527,073	
Inflated to FY25	$ 3,601,847					$ 3,601,847

Exhibit ___ (GIOP-11R)
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Service Replacement (Reactive) - Non-Leaks/Other

3 Year Average (FY17-19) - Inflated	$	6,028,544								
Inflated to FY21	$	6,281,743	$	6,281,743						
Inflated to FY22	$	6,413,660			$	6,413,660				
Inflated to FY23	$	6,550,271					$	6,550,271		
Inflated to FY24	$	6,687,826							$	6,687,826
Inflated to FY25	$	6,829,608								

Exhibit ___ (GIOP-11R)
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Exhibit 1

Historic Spend	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Customer connections – Meter Purchases	$ 1,424,842	$ 1,751,847	$ -	$ -	$ -
Purchase Meters (Replacements)	$ 3,663,880	$ 4,504,749	$ 6,609,298	$ 4,964,476	$ 6,856,868
Install Elevated Pressure Correctors	$ -	$ -	$ -	$ 590,466	$ 1,015,546
Meter Testing Equipment	$ -	$ -	$ 255,085	$ 106,561	$ 611,953

Units	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Customer connections – Meter Purchases	3,122	4,708	-	-	-
Purchase Meters (Replacements)	8,028	12,107	22,143	24,751	19,024
Install Elevated Pressure Correctors	-	-	-	207	205

Unit Cost	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Customer connections – Meter Purchases	$ 456	$ 372	$ -	$ -	$ -
Purchase Meters (Replacements)	$ 456	$ 372	$ 298	$ 201	$ 360
Install Elevated Pressure Correctors	$ -	$ -	$ -	$ 2,852	$ 4,954

Note: Customer Connections and Purchase Meter units and costs all included in Purchase Meter line item for FY18-FY20

Exhibit 2 **Q4 Meter Purchase Replacements**

	FY21	FY22	FY23	FY24	FY25
Units	$ 20,091	$ 20,091	$ 20,091	$ 20,091	$ 20,091
Dollars	$ 6,428,000	$ 6,556,000	$ 6,688,000	$ 7,844,000	$ 8,002,000
Unit Cost	$ 320	$ 326	$ 333	$ 390	$ 398

FY22 Meter Purchase Replacement Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate	
Units Required	17,090	2,350	321	330	300	26,700	19%	31%	
Unit Cost	$ 78.59	$ 126.48	$ 473.28	$ 1,269.90	$ 1,836.00	$ 54.06			
Total Cost	$ 1,343,103	$ 297,228	$ 151,923	$ 419,067	$ 550,800	$ 1,443,402	$ 799,049	$	1,551,417
						FY22 Program Total		$	6,555,990

FY23 Meter Purchase Replacement Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate	
Units Required	17,090	2,350	321	330	300	26,700	19%	31%	
Unit Cost	$ 80.16	$ 129.01	$ 482.75	$ 1,295.30	1,872.72	$ 55.14			
Total Cost	$ 1,369,965	$ 303,173	$ 154,961	$ 427,448	$ 561,816	$ 1,472,270	$ 815,030	$	1,582,446
						FY22 Program Total		$	6,687,110

Exhibit ___ (GIOP-11R)
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FY24 Meter Purchase Replacement Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate	
Units Required	17,090	2,350	321	330	300	26,700	19%	31%	
Unit Cost	$ 120.20	$ 131.59	$ 492.40	$ 1,321.20	$ 1,910.17	$ 56.24			
Total Cost	$ 2,054,218	$ 309,236	$ 158,061	$ 435,997	$ 573,052	$ 1,501,715	$ 956,133	$	1,856,408
						FY22 Program Total		$	7,844,821

FY25 Meter Purchase Replacement Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate	
Units Required	17,090	2,350	321	330	300	26,700	19%	31%	
Unit Cost	$ 122.60	$ 134.22	$ 502.25	$ 1,347.63	$ 1,948.38	$ 57.37			
Total Cost	$ 2,095,302	$ 315,421	$ 161,222	$ 444,717	$ 584,513	$ 1,531,750	$ 975,256	$	1,893,536
							FY22 Program Total		$8,001,717

Exhibit 3 Pipeline Integrity

	FY16	FY17	FY18	FY19	FY20
IVP Total	-	97	2,483	5,313	15,382
IMP Total	13,688	8,160	8,332	8,057	10,140
Washout Total	3,363	1,422	293	2,445	6,221
Reactive Total	-	699	858	4,191	1,089

	FY2021	FY2022	FY2023	FY2024	FY2025
Pipeline Integrity IVP (Integrity Verification Program)	6,845,000	1,407,000	9,155,284	8,424,716	-
Pipeline Integrity IVP - PL 16 HCA Sections - Orange Commons		1,000,000	5,000,000	25,000,000	1,000,000
Pipeline Integrity IVP - PL 16 HCA Sections - Valve 1607 to Northern Blvd		1,000,000	1,000,000	500,000	75,000,000
Pipeline Integrity IVP - PL 16 HCA Sections - Valve 1603 to Lakeport Road		500,000	500,000	500,000	100,000
Pipeline Integrity IVP - PL E18 Pipeline Replacement		-	2,500,000	2,500,000	20,000,000
Pipeline Integrity IMP (Integrity Management Program)	24,939,640	26,975,000	14,657,356	28,005,284	20,930,000
Transmission Pipeline Washout	507,820	521,000	500,000	500,000	500,000
Transmission Pipeline (Reactive)	507,820	1,500,000	1,500,000	1,500,000	1,500,000
	32,800,280	**32,903,000**	**34,812,640**	**66,930,000**	**119,030,000**

Date of Request: October 20, 2020 Request No. DPS-987
Due Date: October 30, 2020 NMPC Req. No. NM-1344

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Richard George

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: GIOP Capital Expenditures - Reliability Category

Request:

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

Exhibit___(GIOP-1) shows Actual and Projected Direct Capital Expenditures for the Historic Test Year and April 1, 2020 – March 31, 2025 (FY 2021 – FY 2025). For the following projects/programs under the Customer Connections category: (1) LTUN12251-Albany Loop Closure; (2) Pressure Regulating Facilities; (3) Smart Residential Methane Detector Program; (4) LTUN_Gas System Reliability - Gas Planning/RCV Programs; and (5) Heater Installation Program:

1. Provide sanction papers that identify each project/program, or related projects/programs, and their cost breakdown, financials, milestones, management approval, any key appendices, and any other relevant information used to justify the Company's conclusion that it chose the best solution.

2. Provide a detailed description for each project/program, if not included in the sanction paper documents.

3. Provide a detailed description and explanation of the planned phasing for this project/program, including the scope of work for each phase, the schedule of each phase by year, and the budgets of each phase.

4. Provide the estimated cost and quantity of work by appropriate unit cost item or service agreement.

5. Provide the benefit cost analysis for each project/program supporting the Company's plan to pursue the project/program.

6. Provide a description of how the Company developed the budgeted project/program cost for both capital and operating expenses for each year through FY 2025 related to each project/program. This should include any relevant information on individual vendor quotes received for estimating project/program costs. Include all supporting workpapers and calculations.

7. Explain whether the Company's Rate Year forecast includes any type of savings associated with implementing each project/program.

   a. If so, identify how much savings were forecast and identify where these savings are shown in the Rate Year forecast, and how the savings were calculated.
   b. If not, explain why the Company believes that no savings will be realized in the Rate Year.
   c. If not, does the Company forecast any type of savings associated with implementing each project/program in either of Data Year 1 or Data Year 2? If so, provide the forecast and explain how the savings were calculated. If not, explain why not.

8. State whether project/program implementation related to each project/program that has already been commenced is on track with the forecasted schedule. Explain any variances.

9. Explain how the project/program compares to industry-wide best practices.

Response:

Unless otherwise specified in the response, the Company's responses below apply to all categories identified in DPS Staff's questions.

1. Sanction papers for these projects and programs are not currently available. Projects and blanket programs for fiscal year ("FY") 2022 will not undergo sanctioning until the fourth quarter of FY 2021 and any specific projects will be sanctioned prior to project commencement. Sanction papers for programs/blankets are submitted annually during the fourth quarter of the preceding fiscal year and are typically approved prior to the start of the first quarter of the next fiscal year. Specific project sanction papers are submitted once spending levels have been established and the project is scheduled to start.

   Support for these projects, including alternatives reviewed and the Company's rationale for selecting a specific project or program, is provided in the whitepapers in Exhibit __ (GIOP-4).

2. Program and projects descriptions are provided in the whitepapers provided in Exhibit __ (GIOP-4).

3. Detailed phased plans for the Rate Year are not available at this time. Programs/Blankets are phased based on historical spend during the work plan cycle, which takes place in the

fourth quarter of the previous fiscal year. Specific projects have custom schedules that are phased as they reach certain gate stages of development in the sanction process.

4. Please see Attachment 1.

5. Specific cost benefits analyses were not performed for these projects and programs. The costs and benefits of the projects and programs were included in the whitepapers in Exhibit __ (GIOP-4).

6. Please see Attachment 1.

7. Where the historical/unit costs are utilized to forecast a project or program, the Rate Year forecast has embedded any savings, or conversely any increases, in those costs. As these costs were already embedded, the Company is unable to break out cost details to show specific savings. For specific projects, detailed savings projects are only available once a project reaches applicable gate stages of the sanction process.

8. The Company's spend and implementation of programs/blankets are based on the Company's fiscal year cycle and will not commence until April 1, 2022. For specific projects, pre-engineering work for multi-year projects may commence prior to FY 2022.

9. The Company participates in various industry wide forums through the American Gas Association, Natural Gas Supply Association, Northeast Gas Distribution Council, and other trade associations. Although the Company supplies information for best practice surveys and review results, because of variables within the service territory (*e.g.*, regional requirements, urban areas, etc.), the Company has not analyzed and compiled the results of such surveys at a level that directly ties to a particular project or program within these categories.

Name of Respondent:
Patricia McVeigh

Date of Reply:
October 30, 2020

Exhibit __ (GIOP-11R)
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DPS 987		
	4. Provide the estimated cost and quantity of work by appropriate unit cost item or service agreement.	**6. Provide a description of how the Company developed the budgeted project/program cost for both capital and operating expenses for each year through FY 2025 related to each project/program. This should include any relevant information on individual vendor quotes received for estimating project/program costs. Include all supporting workpapers and calculations.**
LTUN12251-Albany Loop Closure	775000	A specific project estimate was developed by the project estimating group for the Albany Loop project covering the development, engineering, and construction of the project on a schedule that did not include multiyear delays in the permitting process. National Grid has revised the estimated costs for the interim data years in the rate case to work through the permitting issues. If the permitting process changes any other aspects of the project, the estimate will be revised accordingly to reflect those changes prior to commencing construction.
Pressure Regulating Facilities	Full LP station replacement: $775,000 - $950,000 per station dependent on size and location LP station rebuilds: $100,000 - $500,000 depending on size, condition, and extent of rebuild	The bulk of this budgeted program cost has been determined by historical LP full station replacement costs, with a forward-looking goal of 5-7 replacements / year. An individual LP station replacement project typically occurs over a three-year cycle whereas year 1 is design/procurement at an estimated $102K, year 2 is procurement/construction at an estimated $714K, and year 3 is project as-built/closeout at an estimated $31K. This budget includes a 2% inflation factor each year.
Smart Residential Methane Detector Program	Refer to DPS 829	Refer to DPS 829
LTUN_Gas System Reliability - Gas Planning/RCV I	See detailed spreadsheet for individual job descriptions/estimates within program utilizing best available unit cost data or cost book data at the time Schedule A	See detailed spreadsheet for individual job descriptions/estimates within program utilizing best available unit cost data or cost book data at the time Schedule A.
Heater Installation Program	Heaters direct cost are between $125,000 for a 770 MBTU Heater and $500,000 for a 4.6 MMBTU heater each to purchase. Installation of the heaters will range from $400,000 - $1,000,000. The cost to remove and replace individual heater components varies depending on the size and type of the heater and will range from $30,000 to $150,000.	This budgeted program cost is based on an individual project estimate for a heater replacement at Holcomb Station and the goal to replace 2-4 heaters / year. The individual project costs of each heater replacement are logically scaled, based upon heater size, from the referenced individual project estimate and then applied to the anticipated heater replacements planned each year through FY25. This program also includes replacement of individual heater components (BMS upgrades) based upon historical costs. This budget includes a 2% inflation factor each year.

Reinforcement and Reliability Program

FY	Town	Description	Unit Cost	Estimated Cost	Project Type	Length1	Length2	Length3	MAOP	Main Connections	Service Counts	Cast Iron Footage	Affected Customers (Design Day)
2021	Watervliet	Make a LP connection at the intersection of 5th Ave and 19th St using 45 ft of 6" main	$237	$21,294	New Main	45			LP	2	0	0	116
2021	Albany	Install 400 ft of 6" of 24 psig main on Robin St between Washington Ave and State St	$237	$94,640	New Main	400			24	2	0	0	68
2021	Schenectady	Install 1,300 ft of 4" 32 psig main on Bradley Blvd between Mc Clellan St and N Elm St and make tie-ins at Furman St and Division St. Transfer all trhe LP customers on new MP and retire the LP main.	$246	$319,241	Load Shed	1300			32	4	24	148	242
2021	Albany	Install 3,200 ft of 4" 24 psig main on Hendrick Ave, Amsterdam Ave, Peal St and Wolfert St. Install 500 ft of 2" 24 psig on Highland St, 750 ft of 2" 24# main om Hampton St and 880 ft of 2" 24 psig main on Pawling St. Transfer LP customers on the new MP main. Retire the LP main.	$246	$1,308,888	Load Shed	3200	2130		24	3	100	1844	249
2021	Albany	Install 850 ft of 6" 24 psig main on California Ave and Central Ave,	$246	$1,058,407	Load Shed	850	1730	1730	24	4	80	2797	312
2021	Albany	Install 200 ft of 8" 45 psig of main on Magazine St from Maplewood Ave and Western Ave. Install 1,450 ft of 2" 45 psig main on Tudor Rd. Transfer all LP customers to MP. Retire the LP main.	$246	$405,191	Load Shed	200	1450		45	1	30	307	18
2021	Albany	Install 1,450 ft of 4" main on Cortland Ave, W Lawrence Ave and Bancker St between Allen St and S main Ave	$246	$356,077	Load Shed	1450			24	2	40	921	254
2021	Rotterdam	Install 200 ft of 6" LP main to loop existing 2" LP main on Butler Ln west of Hamburg St	$237	$47,320	New Main	200			LP	2	0		24
2021	Altamont	Install 13640 ft of 8in main on State Rt 146 and Western Ave and connect to the 45 main south of Interconnect valve #6177. OR Uprate existing 32# main on State Rt 146 and Western Ave till interconnect valve to 45#. Move the Valve to north of Hartmans Corner.	Project Graded	$500,000	New Main				45	2	0	0	767
2021	Rexford	Install 9500 ft of 124# 12" ST main on Rt 146. Install a new Regulator station 124# to 45#. Install 4420 ft of 16" 45# main on Rt 146 from the new Reg to Ballston Lake Rd	Project Graded	$2,300,000					45	2	0	0	
2021	Schenectady	PL E-36 Uprate	Project Graded	$1,560,722	Uprate								-
2021	Watertown	Make a tie-in on Bronson St just east of High St using 12" main	$1,422	$71,100	New Main	50			22	2	0	0	1978
2021	Skaneateles	Install 900 ft of 6" 15 psig main on Jewett Rd east of Route 321 Rd to connect the existing mains	$237	$212,940	New Main	900			15	2	0	0	356
2021	Bridgeport	Install 380 ft of 4" 24 psig main on Shackelton Point Rd east of Pierce Rd till Shore Lawn Dr. Install 580 ft of 4" 24 psig main on Shackelton Point Rd from east of Shore Lawn Dr and connect the existing mains	$237	$227,136	New Main	960			24	4	0	0	57
		Carry Over Projects		$1,717,045									-
				$10,200,000									
2022	Altamont	Install 13640 ft of 8in main on State Rt 146 and Western Ave and connect to the 45 main south of Interconnect valve #6177. OR Uprate existing 32# main on State Rt 146 and Western Ave till interconnect valve to 45#. Move the Valve to north of Hartmans Corner.	Project Graded	$6,000,000	New Main	13,640			45	2	0	0	
2022	Hanagan	Install 300 ft of 4" 28 psig main on Northern Blvd from Pawling St and Church St	$245	$73,500	New Main	300			28	2	0	0	
2022	Cohoes	Install 680 ft of 4" 24 psig main on James St from Krug St and Jefferson Ave. Pressure test 578 ft of plastic main on Montgomery St and Jefferson St. Install 360 ft of 2" 24 psig main on Jefferson Ave (East of James St). Transfer approximately 20 LP customers on MP. Only Retire LP main on Jefferson Ave.	$268	$433,090	Load Shed	680	360	578	24	1	20	0	
2022	Albany	Install 240 ft of 4" main on Ryckman Ave and 160 ft of 2" main on Mercer St. Retire the LP main on Ryckman Ave. Transfer approx. 6 LP customers on MP. (CI footage: 342 ft)	$268	$107,068	Load Shed	240	160		24	3	6	342	
2022	Albany	Install 500 ft of 8" LP main on New Scotland Rd and Normanside Dr and connect to the existing mains	$245	$122,500	New Main	500			LP	2		0	
2022	Pennelville	Install 8,700 ft of 12" 24 psig on County Hwy 12 and connect the existing 8" mains on County Hwy 12 and Oneida River Rd	Project Graded	$2,700,000	New Main	8700			24	2	0	0	
				$9,436,158									
2023	Amsterdam	Make a tie-in on Brookside Ave just north of Elias St using a 4" 28 psig main	$253	$25,300	New Main	50			28	2	0	0	
2023	Wilton	Install 4,200 ft of 6" 45 psig main on Ballard Rd from North Rd to existing main on Ballard Rd	$253	$1,062,600	New Main	4200			45	2	0	0	
2023	Rotterdam	Install 2,600 ft of 8" of 32 psig main on Lilac St, Evergreen St, Tulip St and Guilderland Ave. Install 350 ft of 2" main on Tulip St between Lawn Ave and Evergreen St. Install 580 ft of 2" of 2" main on Evergreen Ave between Tulip St and Pansy St. Install 600 ft of 4" main on Pansy St between Lawn Ave and Arbor Ave. Install 580 ft of 4" main on Arbor Ave from Tulip St and Pansy St. Transfer approximately 55 LP customers to MP. Retire the LP main on Evergreen Ave, Pansy St, Tulip St (between Lawn Ave and Evergreen St) and Arbor Ave (between Tulip St and Pansy St).	$276	$1,298,547	Load Shed/ New Main	2600	1180	930	32	4	55	0	
2023	Rexford	Rt 146	Project Graded	$70,000									
2023	Schenectady	Install 3,000 ft of 8" 32 psig main on Barrett St, Liberty St, Notter Ave and Eastern Ave. Retire the LP main on Barrett St and transfer about 10 LP customers to MP.	$253	$806,520	Load Shed/ New Main	3000			32	2	10	217	
2023	Black River	Install 5,000 ft of 8" 60 psig main on State Route 342 from existing main on NY State Route 3 to 4" main on Howe St (with a future possibility of extending the main to Leray St).	Project Graded	$2,250,000	New Main	5000			60	2	0	0	
2023	Central Square	Install 700 ft of 4" 24 psig main on Summerhill Dr from existing main on south of State Hwy 49 to Green Acres Dr	$253	$177,100	New Main	700			24	2	0	0	
		LP		$3,000,000									
				$8,690,067									

Reinforcement and Reliability Program

FY	Town	Description	Unit Cost	Estimated Cost	Project Type	Length1	Length2	Length3	MAOP	Main Connections	Service Counts	Cast Iron Footage	Affected Customers (Design Day)
2024	Schuykerville	Install 250 ft of 2" 19 psig main on Clancy St from County Hwy 336 to the existing main on Clancy St	$262	$65,500	New Main	250			24	2	0	0	
2024	Albany	Install 260 ft of 8" 24 psig main on Central Ave just south of Reber St and connect the existing main on Central Ave	$262	$68,120	New Main	260			24	2	0	0	
2024	Rensselaer	Install 3,100 ft of 6" 24 psig main on Bloominggrove Dr, Green Hill Rd and Snyders Lake Rd from the existing 6" main north of Teliska Ave. Make intermediate tie-ins at Sitzmark Ln and Lape Rd.	$262	$812,200	New Main	3100			24	3	0	0	
2024	Albany	Make a tie-in using a 4" 24 psig at the intersection of Hansen Ave and Ryckman Ave	$262	$26,200	New Main	50			24	2	0	0	
2024	Albany	Make a tie-in using a 2" 24 psig at the intersection of Partridge St and Central Ave	$262	$26,200	New Main	50			24	2	0	0	
2024	Albany	Install 650 ft of 2" 24 psig main on Colonie Plaza Dr (Near Price Chopper Super Center)	$262	$170,300	New Main	650			24	2	0	0	
2024	Various	MP Projects TBD (Central)		$1,000,000									
2024	Various	**LP**		$3,000,000									
				$5,168,520									
2025	Various	MP Projects TBD (Central)		$1,000,000									
2025	Rotterdam	Install 4,500 of 8" main on Hamburg St from Abbottsford Rd and make tie-ins at Cladicott Rd, Chepstow Rd, Carleon Rd and Cardiff Rd. Install 1,300 ft of 6" main on Christler Ave and Tower Rd from Hamburg St.	$271	$1,571,800	New Main	4500	1300		32	6	0	0	
		LP		$3,000,000									
				$5,571,800		67525	12730	3238				6576	
						83493							

FY	Town	Project	Unit Cost	New Estimate	# of Customers Affected
2021	Colonie	Install a RCV and Flow Control Valve at Wolf Gate Station (Construction))	Project Graded	$3,347,328	
2021	Albany	Upgrade LP main to MP to retire Regulator Station at Maple		$200,000	
		Install RCV at valve V-5201 Velasko Rd & Onondaga Blvd	Project Graded	$419,000	
2021	Rotterdam	Install 3000' of 12" plastic on Duanesburg Rd from Keller Ave to Rotterdam St. (a portion of this main will either need to be strung on the bridge, or drilled under 4 train tracks)	Project Graded	$3,420,705	17571
		Engineering		$ -	
				$ 7,387,033	
2022	Rensselaer	924-302B Ferry St and 924-346 2nd Ave - 9,132 ft of main (Steel: 3,175 ft, Plastic: 3,407 ft, CI and BS: 2,550) and 188 customers	$268	$1,222,181	Isolated LPP
2022	Amsterdam	924-812 Edson St - 9,222 ft of main (Steel: 3,654 ft, Plastic: 2,722 ft, CI and BS: 2,846) and 178 customers	$268	$1,234,226	Isolated LPP
2022	Rotterdam	Burdeck Gate Station or Valve #401-71	Cost Book	$ 113,214	RCV
		Engineering			
				$ 2,569,621	
2023	Rensselaer	924-302B Ferry St and 924-346 2nd Ave - 9,132 ft of main (Steel: 3,175 ft, Plastic: 3,407 ft, CI and BS: 2,550) and 188 customers	$276	$1,258,846	Isolated LPP
2023	Amserdam	924-812 Edson St - 9,222 ft of main (Steel: 3,654 ft, Plastic: 2,722 ft, CI and BS: 2,846) and 178 customers	$276	$1,271,253	Isolated LPP
2023	Glenmont	Install 3800 ft of 12" main from existing main on Kenwood Ave to outlet of GRS 924-348	Project Graded	$1,900,000	Loss of GRS 340 (15575 Customers)
		Engineering			
				$ 4,430,099	
2024	Troy	924-539 Brookview Avenue - 10,551 ft of main (Steel:4,427 ft, Plastic: 2,213 ft, CI and BS: 3,911) and 173 customers	$284	$1,498,084	
2024	Albany	924-349 Lodge St - 10,037 ft of main (Steel:693 ft, Plastic: 2,073 ft, CI and BS: 7,271) and 59 customers	$284	$1,425,103	Isolated LPP
2024	Oneida	Install one valve at Oneida Regulator Station feed to Rome	Cost Book	$2,184,451	RCV
		Engineering			
				$ 5,107,639	
2025	Troy	924-539 Brookview Avenue - 10,551 ft of main (Steel:4,427 ft, Plastic: 2,213 ft, CI and BS: 3,911) and 173 customers	$292	$1,543,031	
2025	Albany	924-349 Lodge St - 10,037 ft of main (Steel:693 ft, Plastic: 2,073 ft, CI and BS: 7,271) and 59 customers	$292	$1,467,861	Isolated LPP
2025	Phoenix	At Biddlecum Gate Station	Cost Book	$2,228,140	RCV
		Engineering			
				$ 5,239,032	

Date of Request: October 20, 2020 Request No. DPS-988
Due Date: October 30, 2020 NMPC Req. No. NM-1345

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Richard George

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: GIOP Capital Expenditures - Infrastructure Category

Request:

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

Exhibit___(GIOP-1) shows Actual and Projected Direct Capital Expenditures for the Historic Test Year and April 1, 2020 – March 31, 2025 (FY 2021 – FY 2025). For the following projects/programs under the Customer Connections category: (1) AMI; and (2) Tools & Equipment – Various:

1. Provide sanction papers that identify each project/program, or related projects/programs, and their cost breakdown, financials, milestones, management approval, any key appendices, and any other relevant information used to justify the Company's conclusion that it chose the best solution.

2. Provide a detailed description for each project/program, if not included in the sanction paper documents.

3. Provide a detailed description and explanation of the planned phasing for this project/project, including the scope of work for each phase, the schedule of each phase by year, and the budgets of each phase.

4. Provide the estimated cost and quantity of work by appropriate unit cost item or service agreement.

5. Provide the benefit cost analysis for each project/program supporting the Company's plan to pursue the project/program.

6. Provide a description of how the Company developed the budgeted project/program cost for both capital and operating expenses for each year through FY 2025 related to each

project/program. This should include any relevant information on individual vendor quotes received for estimating project/program costs. Include all supporting workpapers and calculations.

7. Explain whether the Company's Rate Year forecast includes any type of savings associated with implementing each project/program.

   a. If so, identify how much savings were forecast and identify where these savings are shown in the Rate Year forecast, and how these savings were calculated.
   b. If not, explain why the Company believes that no savings will be realized in the Rate Year.
   c. If not, does the Company forecast any type of savings associated with implementing each project/program in either of Data Year 1 or Data Year 2? If so, provide the forecast and explain how the savings were calculated. If not, explain why not.

8. State whether project/program implementation related to each project/program that has already been commenced is on track with the forecasted schedule. Explain any variances.

9. Explain how the project/program compares to industry-wide best practices.

Response:

Unless otherwise specified in the response, the Company's responses below apply to (1) AMI; and (2) Tools & Equipment – Various.

1. With respect to AMI, please see Exhibit ___ (AMIP-1), Exhibit ___ (AMIP-2), and Exhibit___ (AMIP-3) for the *Report of Niagara Mohawk Power Corporation d/b/a National Grid on the Proposed Implementation of Advanced Metering Infrastructure* dated November 15, 2018 ("AMI Report"), the Supplemental Filing of Niagara Mohawk Power Corporation d/b/a National Grid on the Proposed Implementation of Advanced Metering Infrastructure dated September 4, 2019 ("Supplemental AMI Report"), and the Benefit-Cost Analysis ("BCA") supporting the Company's proposal, respectively. The Company will complete the initial project sanctioning process following Commission approval during the managed ramp-up period, which is described in the Company's AMI Panel's direct testimony (page 9 of 31).

   With respect to Tools & Equipment, sanction papers are not currently available. Projects and blanket programs for fiscal year ("FY") 2022 will not undergo sanctioning until the fourth quarter of FY 2021 and any specific projects will be sanctioned prior to project commencement. Sanction papers for programs/blankets are submitted annually during the fourth quarter of the preceding fiscal year and are typically approved prior to the start of the first quarter of the next fiscal year. Specific project sanction papers are submitted once spending levels have been established and the project is scheduled to start. Support for Tools & Equipment, including alternatives reviewed and the Company's rationale for

selecting a specific project or program, is provided in the whitepaper in Exhibit __ (GIOP-4).

2. For AMI, please see the response to Question 1 above. For Tools & Equipment, program and projects descriptions are provided in the whitepapers provided in Exhibit __ (GIOP-4).

3. With respect to AMI, as set forth in the Company's AMI Panel's direct testimony (pages 6, 9, and 10 of 31), the Company proposed a six-year AMI deployment program. The plan consists of two years of back-office system installation, followed by four years of AMI meter and gas module deployment. Please see Exhibit___(AMIP-1) and Exhibit (AMIP-2) for further detail on the scope of work and schedule for each phase. Please also see Exhibit (AMIP-3), Schedules 2, 3, and 10 for additional information on the deployment schedule and associated budgets.

   For Tools & Equipment, detailed phased plans for the Rate Year are not available at this time. Programs/Blankets are phased based on historical spend during the work plan cycle, which takes place in the fourth quarter of the previous fiscal year. Specific projects have custom schedules that are phased as they reach certain gate stages of development in the sanction process.

4. Please see Attachment 1.

5. For AMI, please see Exhibit ___ (AMIP-3). For Tools & Equipment the costs and benefits of the projects and programs were included in the whitepapers in Exhibit __ (GIOP-4).

6. Please see Attachment 1.

7. With respect to AMI, as noted in response to Question 3 above, the first two years of the project are focused on the back-office systems. The Company does not anticipate realizing benefits until after the AMI meters and gas modules are installed beginning in fiscal year ("FY") 2025. Please see Exhibit___(AMIP-4) for additional detail on the benefits calculations in FY 2025 and FY 2026.

   For Tools & Equipment, where the historical/unit costs are utilized to forecast a project or program, the Rate Year forecast has embedded any savings, or conversely any increases, in those costs. As these costs were already embedded, the Company is unable to break out cost details to show specific savings. For specific projects, detailed savings projects are only available once a project reaches applicable gate stages of the sanction process.

8. With respect to AMI, the project remains pending, subject to consideration by the Commission. Although the AMI proposal was not approved on the Commission's October agenda, as assumed for purposes of the rate case forecasts, the Company will seek to launch the project in line with its rate case assumptions, if the Commission approves the AMI proposal at its November 2020 session.

For Tools & Equipment, the Company's spend and implementation of programs/blankets are based on the Company's fiscal year cycle and will not commence until April 1, 2022. For specific projects, pre-engineering work for multi-year projects may commence prior to FY 2022.

9. With respect to AMI, please see the Company's response to DPS-392, Question 7. For Tools & Equipment, the Company participates in various industry wide forums through the American Gas Association, Natural Gas Supply Association, Northeast Gas Distribution Council, and other trade associations. Although the Company supplies information for best practice surveys and review results, because of variables within the service territory (*e.g.*, regional requirements, urban areas, etc.), the Company has not analyzed and compiled the results of such surveys at a level that directly ties to a particular project or program within the Tools & Equipment – Various category.

Name of Respondent:
Patricia McVeigh
Kristoffer Kiefer

Date of Reply:
October 30, 2020

Niagara Mohawk Power Corpo ration
d/b/a National Grid
Cases 20-E-0380 and 20-G-0381
DPS-988 Attachment 1
Page 1 of 1

DPS 988		
	4. Provide the estimated cost and quantity of work by appropriate unit cost item or service agreement.	**6. Provide a description of how the Company developed the budgeted project/program cost for both capital and operating expenses for each year through FY 2025 related to each project/program. This should include any relevant information on individual vendor quotes received for estimating project/program costs. Include all supporting workpapers and calculations.**
AMI	Please see Exhibit---___(AMIP-3), schedule 10.	Please see Exhibit ___ (AMIP-1), Exhibit ___ (AMIP-2), and Exhibit___ (AMIP-3).
Tools & Equipment - Various:	The project estimate is based on 3 year historic cost average ($1,014,324) adjusted for inflation.	The project estimate is based on 3 year historic cost average ($1,014,324) adjusted for inflation. FY24 has an increase in spend to fund the needed replacement of the combustible gas indicator (CGI) inventory. This population includes 700 CGI's at $3,107/unit.

Date of Request: October 20, 2020 Request No. DPS-990
Due Date: October 30, 2020 NMPC Req. No. NM-1347

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Richard George

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: Incremental FTEs

Request:

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

As shown in Exhibit__(GIOP-6), the Company proposes to hire 136.5 incremental FTEs in the Rate Year and Data Years.

1. For each position listed, provide:

   a. Specify the current number of FTEs with each title.

   b. Specify the current workload for the FTEs in each position.

   c. Provide a work description for the current employees in each position.

   d. Describe specific changes to workload that are driving the need for additional employees.

   e. Is there new equipment or tools that require a different skill set? If so, describe the new equipment or tools that are impacting each FTE title.

   f. Are there changes to existing equipment that requires a different skill set? If so, describe the changes to existing equipment that are impacting each FTE title.

   g. Is the Company retiring work stations?

   h. Provide a work description of proposed employees (if different than current).

   i. Specify the work location of the proposed employees.

   j. Specify the work location of existing employees.

k. How many of the existing FTEs are projected to retire by the end of the Rate Year? List by title and work location.

l. Has NMPC management approved the plan to hire the additional employees? If so, provide a description of the process and timing of the approval.

m. If the new FTE position has not been hired, provide an explanation as to why not, for each additional FTE by type and work location.

n. How did the Company determine the number of incremental hours needed, and how does that translate to the number of FTEs by type?

o. How will safety performance and compliance be improved?

p. What are the benefits to customers associated with each type of FTE?

q. Will there be improved customer service associated with the additional FTEs? If so, describe how each type of FTE will improve customer service.

r. Identify whether the title is a new or existing title.

s. Provide the annual FTE count over the past 10 calendar years for each title identified as existing.

2. For each of the proposed position, provide:

a. A detailed description of the FTE's roles and responsibilities;

b. A detailed description of how the Company determined the need and timing for the FTE; and

c. The proposed FTE salary and a detailed description of how the Company determined the proposed salary.

3. Explain which capital expenditure programs or projects would be supported by each FTE that includes the description "FTE's primarily support the capital investments plan."

Response:

1. a. As discussed with DPS Staff, incremental FTE positions reflected in Exhibit___ (GIOP-6CU) can exist at both Niagara Mohawk and Service Company. The Service Company provides services to all National Grid USA companies, and therefore Service Company employees can charge time to multiple operating companies, including Niagara Mohawk. To determine the FTEs for Service Company positions that are relevant to work for Niagara Mohawk would require a significant effort of time and resources to analyze hours charged by various Service Company employees over multiple years. Therefore, Attachment 1 presents Niagara Mohawk employees only (*i.e.*, who charge 100 percent of their

time to Niagara Mohawk), in the same positions requested as the incremental FTEs in Exhibit___(GIOP-6CU).

b. – f. See Attachment 2 for the Company's proposal to hire 135.7 FTEs per Exhibit __ (GIOP-6CU).

g. Ongoing review of Company facilities is conducted to determine the need for work stations and work station enhancements. At this time, there are no plans to retire work stations.

h. – j. See Attachment 2.

k. Attachment 1 provides a forecast of retirements in the same positions requested as the incremental FTEs in Exhibit ___ (GIOP-6CU) for Niagara Mohawk only and does not include forecast retirements for Service Company for the same reasons discussed in Company's response to question (a) above.

l. The Company's rate case filing is reviewed and approved by a senior executive steering committee prior to submittal. This serves as a commitment to hire the employees approved in the rate case settlement.

m. Please see the Company's response to DPS-473 for information on why a FTE position has not been filled if the forecast start date has past. The Company updates this response on a monthly basis.

n. – r. See Attachment 2.

s. Attachment 1 presents staffing levels in the same positions requested as the incremental FTEs in Exhibit ___ (GIOP-6CU) for Niagara Mohawk employees and does not include Service Company employees for the same reasons discussed in response to question (a) above. Also, as discussed with DPS Staff, the Company is providing staffing levels for seven years going back to 2013. Prior to 2013, the Company used a different general ledger, payroll, and other sub-ledger systems, and operated under a different cost center hierarchy, so to obtain the staffing levels for those years would require a significant effort, time, and resources.

2. a. – b. See Attachment 2

c. Please see Exhibit ___ (RRP-11CU), Workpapers to Exhibit ___ (RRP-3CU), Workpaper 2 for a listing of Incremental FTEs included in Exhibit ___ (GIOP-6CU), along with the forecast salaries. As provided in the Company's response to DPS-474, salaries in the referenced Workpaper 2 are from payroll as of December 31, 2019 – the end of the Historic Test Year. Payroll for the operating company to which the FTE is assigned is used to determine the salary for the FTE's position. If payroll for that operating company does not have the position, then

the position in Service Company payroll is used to determine the salary for the position. The final salary used in calculating the cost associated with the FTE is the midpoint between the lowest and average salary on payroll for the position.

3. See Attachment 2.

Name of Respondent:
Patricia McVeigh
Mark Stiner

Date of Reply:
October 30, 2020

Niagara Mohawk Power Corporation
FTE Staffing levels and Forecast Retirements by Calendar Year
DPS-990

		FTE Staffing Levels								Forecast Retirements	
FTE Job Title	**CA Position Description - LT3**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**7/2020**	**2021**	**2022**
Field Tester	**Field Tester D Gas**	3							1	0	0
	Field Tester E Gas	6	9	8	8	8	6	8	5	0	0
Field Tester Total		**9**	**9**	**8**	**8**	**8**	**6**	**8**	**6**	0	0
Gas Mechanic	**Chief Gas Mechanic A**	64	69	70	75	70	67	69	63	4	8
	Gas Mechanic A	18	30	25	42	37	12	24	45	0	0
	Gas Mechanic B	1	21	55	46	47	53	28	31	0	0
	Gas Mechanic C	105	95	72	74	80	74	73	81	2	3
	Gas Mechanic Helper	1	21	1	28	5	26	54	15	-	-
	I&R Chief Gas Mechanic A	13	12	9	10	9	11	8	10	1	3
	I&R Gas Mechanic B	-	2	3	12	12	9	9	13	0	0
	I&R Gas Mechanic C	11	15	15	13	16	21	26	25	0	1
Gas Mechanic Total		**213**	**265**	**250**	**300**	**276**	**273**	**291**	**283**	8	16
Gas Meter Mechanic	**Gas Meter Mechanic A**	1	2							-	-
	Gas Meter Mechanic B	1	2	3	1	1		1		-	-
	Gas Meter Mechanic C	4	3	2	4	3	4	4	5	0	1
	Gas Meter Mechanic D	1	1	1	1	1	1	1	1	0	1
	Meter Mechanic	2	2	2	2	2	2	2	2	-	-
Gas Meter Mechanic Total		**9**	**10**	**8**	**8**	**7**	**7**	**8**	**8**	1	2
Service Representative	**Service Representative A**	87	111	57	97	90	83	86	1	-	-
	Service Representative ANP	-							76	3	6
	Service Representative B	33	52	76	63	41	41	50	51	0	0
	Service Representative C	123	120	131	143	165	165	168	166	6	11
Service Representative Total		**243**	**283**	**264**	**303**	**296**	**289**	**304**	**294**	9	17
Supervisor	**Assoc Admin Business Support**	-	-	-	-	-	1	-	-	-	-
	Assoc Supv GDP	-	-	-	-	-	-	1	1	-	-
	Assoc Supv Operations	1	1	1	3	2	-	-	-	-	-
	Assoc Supvsr CMS	-	-	-	-	-	2	-	-	-	-
	Assoc Supvsr Gas Field Ops	-	-	-	-	-	2	-	-	-	-
	Lead Eng Supv-Operations	2	2	1	-	-	-	-	-	-	-
	Lead Supervisor, Customer Meter Services	-	-	-	-	-	-	-	1	-	-
	Lead Supv Operations	3	3	3	3	7	-	4	2	-	-
	Lead Supvsr CMS	-	-	-	-	-	2	-	-	-	-
	Lead Supvsr Gas Field Ops	-	-	-	-	-	3	-	-	-	-
	Senior Supervisor, Gas Field Operations	-	-	-	-	-	-	1	7	0	0
	Senior Supervisor, Gas Instrumentation	-	-	-	-	-	-	-	1	-	-
	Snr Supvsr CMS	-	-	-	-	-	10	-	-	-	-
	Snr Supvsr Gas Field Ops	-	0	0	0	0	16	0	0	-	-
	Snr Supvsr Gas Instrum & Reg	-	-	-	-	-	1	-	-	-	-
	Sr Supv Operations	25	32	28	30	27	-	30	27	1	2
	Sr Supvsr Gas Const & Maint Enging	-	-	-	-	-	3	-	-	-	-
	Supervisor, Customer Meter Services	-	-	-	-	-	-	3	3	-	-
	Supervisor, Gas Field Operations	-	-	-	-	-	-	4	4	-	-
	Supv Operations	10	13	16	32	30	-	27	19	0	1
	Supvsr CMS	-	0	0	0	0	8	0	0	-	-
	Supvsr Gas Field Ops	-	0	0	0	0	18	0	0	-	-
	Supvsr Gas Instrum & Reg	-	0	0	0	0	1	0	0	-	-
Service Supervisor Total		**41**	**51**	**49**	**68**	**66**	**67**	**70**	**65**	1	3

Exhibit ___ (GIOP-11R)
Page 59 of 145

2	3
b. A detailed description of how the Company determined the need and timing for the FTE	**E. Explain which capital expenditure programs or projects would be supported by each FTE that includes the description "FTE's primarily support the capital investments plan."**
Currently the existing DPA is under staffed. The increase of third-party damages over the past few years along with increase one-call ticket volumes. With the increase in DPA an additional FTE is required to to manage the program along with other Damage Prevention Programs. THe FTE would contribute to a higher level of managing the DPA program, which will promote safety for the customers and communities we serve.	N/A
Please refer to DPS 729, Answers 3 and 4.	Please refer to DPS 729, Answers 3 -7.
Please refer to DPS 729, Answers 3 and 4.	Please refer to DPS 729, Answers 3 -7.
Please refer to DPS 729, Answers 3 and 4.	Please refer to DPS 729, Answers 3 -7.
Ther GTTT project is currently being rolled out. The need for incremental Gas Mechanics associated with this new training program, in addition to new hiring forecasts create the need for greater resources.	All Training activities involved supporting installation, Operation and maintenance of work associated with with Capital plant improvements.
Ther GTTT project is currently being rolled out. The need for Service Representatives associated with this new training program, in addition to new hiring forecasts create the need for greater resources.	All Training activities involved supporting installation, Operation and maintenance of work associated with with Capital plant improvements.
Ther GTTT project is currently being rolled out. The need for Field Mentors associated with this new training program, in addition to new hiring forecasts create the need for greater resources.	All Training activities involved supporting installation, Operation and maintenance of work associated with with Capital plant improvements.
The Company is using Advanced Leak Detection (ALD) technology to discover high emitters that need to be eliminated in a timely manner.	High emitter leak repairs are estimated to consist of 24% CAPEX and 76% OPEX.
Currently, I&R is being Supervised by a single Supervisor in each geographic area of Upstate (Syracuse, Watertown, Utica, Albany, Gloversville/Saratoga. Supervisors are completely responsible in their area of assignment for managing and operating pressure reducing stations, gate stations, transmission pipelines, large industrial metering sites, customer facing work for commercial customers, supporting construction activities associated with Transmission Pipeline Integrity Management, Main Replacement, New Customer connections, and the management and oversight of local Union employees. Local I&R Supervisors are also responsible for managing all off-hours emergencies and system problems as a result of notifications from Gas Control. On average, I&R Supervisors are working 60+ hour work-weeks in addition to off-hours and weekend system problems. The vast majority of work beyond 40 hours per week is not eligible for overtime pay. The large workload and associated work hours result in significant "quality of life" implications for I&R Supervisors and makes retention of these individuals difficult. I&R Supervisors are responsible for managing and operating complex transmission and distribution networks and gas facilities that contain very complicated gas processing equipment and instrumentation. Many of these facilities benefit from formal Engineering training and education. Failure to properly maintain and operate these facilities has the potential to result in catastrophic failures, significant cost impacts to both the Company and Customers, and severe Regulatory Compliance implications. Currently, I&R has no means to back up any of the local I&R Supervisors for times when the normal Supervisor is absent or occupied with other Company business. This results in a situation where the Union workforce is essentially unsupervised and acting upon their own knowledge and experience, increasing the risk that errors could be made while working on complicated systems. Additionally, institutional knowledge and experience is concentrated in a small number of individuals and increases the risk to the Company and Customers should a Supervisor retire, become ill, or take a different role within the Company. Even for highly qualified individuals with Engineering or other educational backgrounds, it will require a minimum of 3 years to become proficient in I&R systems, tasks, and requirements. The lack of a means to duplicate I&R Supervisory knowledge and experience poses a significant safety and operational risk to both the Company and Customers. Accordingly, the Company is requesting the addition of 2 incremental I&R Supervisors, one each in the Syracuse and Albany areas, to help mitigate the quality of life issues for existing Supervisors, to replicate institutional knowledge in a larger group of employees, to be ready to respond to the loss of one of the current Supervisors, and to reduce the operational and safety risks to the Company and Customers by reasonably expanding the base of I&R Supervisory oversight for a highly critical role.	I&R Supervisors support several Capital programs including the I&R Proactive, Gas Transmission Pipeline Integrity, Regulator Station Integrity, Complex Construction and Capital Delivery, and other programs where pipeline system management and outage control is involved.
Industry events such as Silver Springs, Maryland in which a failed service regulator and disconnected vent line resulted in fatalities has emphasized the need to expand the scope of National Grid's current multi-meter regulator inspections to single-meter regulator inspections.	No
Industry events such as Silver Springs, Maryland in which a failed service regulator and disconnected vent line resulted in fatalities has emphasized the need to expand the scope of National Grid's current multi-meter regulator inspections to single-meter regulator inspections.	No
DPS 829	Smart Meter and Residential Methane Detection Programs
DPS 829	Smart Meter and Residential Methane Detection Programs
Alignment with increased work plan	Complex Projects
Alignment with increased work plan	Complex Projects
Alignment with increased work plan	Complex Projects
Alignment with increased work plan	Complex Projects
Alignment with increased work plan	Complex Projects
Alignment with increased work plan	Complex Projects
Alignment with increased work plan	Complex Projects
Alignment with increased work plan	Complex Projects
Based on increase to projected capital plan	Support the complex capital plan
Based on increase to projected capital plan	Support the complex capital plan
Alignment with increased work plan	Complex Projects
Alignment with increased work plan	Complex Projects
The Voluntary Integrity Management Program will be passed through this year's rate case, which will rely on the additional Corrosion FTEs to perform the work. PHMSA's plastic rule, which has been in affect, will require more inspections, remediation and monitoring in our department.	Although not a capital project, these FTEs will support Pipeline Integrity's Voluntary Integrity Management Program.
Refer to DPS 990, Question 1	Refer to GIOP-5
Refer to DPS 990, Question 1	Refer to GIOP-5
It was determined that individuals were needed to deliver First Responder technical training programs to clients through a blended learning approach such as hands on activities, Train the trainer programs and in person training to simulate real tasks, ensuring National Grid is effectively providing training in line with external requirements, operational priorities and best practice.	N/A
Please refer to DPS 729, Answers 3 and 4.	Please refer to DPS 729, Answers 3 -7.
Ther GTTT project is currently being rolled out. The need for Field Evaluation associated with this new training program, in addition to new hiring forecasts create the need for greater resources.	All Training activities involved supporting installation, Operation and maintenance of work associated with with Capital plant improvements.
Refer to DPS 990 Q1	N/A
Please see response to DPS-825 for the FTE need. For timing, 4 FTEs to be hired in Q1 of FY22, 2 FTEs to be hired in Q2 of FY22 and 2 FTEs will be hired in Q4 of FY22.	All capital programs as QA provides second line of assurance to potentially every program and project.
Refer to DPS 829	Smart Meter and Residential Methane Detection Programs
The company determined the need for this employee due to the increased workload projected for the Capital Planning through the overpressure protection program and the transmission station integrity program. Currently, station records review is underway but some stations have already been identified to be lacking TVC records. Due to requisite completion metrics in 2028 and 2035 outlined by PHMSA, the TSIP program needs FTE support as soon as possible to ensure National Grid can acheive compliance.	Capital engineers are responsible for planning and project support for all capital programs in the Pressure Regulation Engineering portfolio. This includes the Heater, Pressure Regulation Facilities, System Automation, Special Projects, Overpressure Protection, Gate Station Overpressure Protection, and Transmission Station Integrity programs. Additionally they support I&R requests, and often facilitate work from the I&R reactive program. PRE Capital Engineers are also projected to provide support for proposed I&R programs, such as the Oil Seal Replacement Program.
The company determined the need for this employee to comply with federal code. The timing of the FTE request is due to the initiation of this program.	N/A
Timing is based on effective date of new PHMSA rule making	All Transmission Pipeline Related Proejects
Timing is based on effective date of new PHMSA rule making	OPEX Related to IMP Only
Timing is based on effective date of new PHMSA rule making	OPEX Related to IMP Only
Timing is based on effective date of new PHMSA rule making	OPEX Related to IVP Only

Date of Request: October 21, 2020 Request No. DPS-1020
Due Date: November 2, 2020 NMPC Req. No. NM-1397

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: DPS Staff, Richard George

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: Justification for Rate Year Expenditures

Request:

Note: In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

Exhibit__(GIOP-1) provides actual and projected capital expenditures by budgeting category and by line item. With reference to the budget line items listed in this Exhibit, provide the following:

1. Identify how the Rate Year budget was developed (e.g., unit and unit cost, project estimate or historical spend).

2. Identify any additional anticipated new requirements, new programs, and projects or other known factors that the Company considered in the development of the Rate Year budget.

3. If a unit and unit cost basis was used, provide five years of historic data by fiscal year (units, unit costs, and historic expenditures).

4. If a unit and unit cost basis was used, identify the time period the Company relied on to develop its Rate Year budget.

5. If a project estimate was used, explain how the estimate was developed and provide any historical experience by fiscal year that the Company believes supports finding that the Rate Year budget is reasonable.

6. If a historical spend basis was used, provide five years of historic data by fiscal year.

7. If a historical spend basis was used, identify the time period the Company relied on to develop its Rate Year budget.

Response:

1. – 7. See Attachments 1 and 2. Attachment 2 is referenced in tab 1020 of Attachment 1.

Name of Respondent:
Patricia McVeigh

Date of Reply:
November 2, 2020

Classification	Category	Historic Test Year	Fiscal Year 21	Rate Year	Data Year 1	Data Year 2	Data Year 3	Responder	1. Identify how the Rate Year budget was developed (e.g., unit and unit cost, project estimate or historical spend).	2. Identify any additional anticipated new requirements, new programs, and projects or other known factors that the Company considered in the development of the Rate Year budget.	3. If a unit and unit cost basis was used, provide five years of historic data by fiscal year (units, unit costs, and historic expenditures).	4. If a unit and unit cost basis was used, identify the time period the Company relied on to develop its Rate Year budget.	5. If a project estimate was used, explain how the estimate was developed and provide any historical experience by fiscal year that the Company believes supports finding that the Rate Year budget is reasonable.	6. If a historical spend basis was used, provide five years of historic data by fiscal year.	7. If a historical spend basis was used, identify the time period the Company relied on to develop its Rate Year budget.
Customer Connections															
Mains & Svc	Customer Connections - Install Main	5,680,817	7,653,383	6,732,189	8,181,532	8,371,028	8,515,047	Zulberti/Foran	Unit/Unit Cost	Current trends and expected Economic impacts.	See Schedule A & B	04/01/2016-03/31/2019	Does not apply	Does not apply	Does not apply
Mains & Svc	Customer Connections - Install Services	8,266,185	9,784,219	9,743,418	10,763,478	11,185,689	11,418,979	Zulberti/Foran	Unit/Unit Cost	Current trends and expected Economic impacts.	See Schedule A & B	04/01/2016-03/31/2019	Does not apply	Does not apply	Does not apply
Mains & Svc	Customer Connections - Neighborhood Expansion Program - N	645,954	-	-	-	-	-	Zulberti/Foran	Unit/Unit Cost	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.
Mains & Svc	Customer Connections - Neighborhood Expansion Program - S	245,535	-	-	-	-	-	Zulberti/Foran	Unit/Unit Cost	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.	The Company does not plan to continue the Neighborhood Expansion Proram after 03/31/2021.
Mains & Svc	Customer Connections - Customer Contributions	(1,450,169)	(1,946,464)	(1,788,606)	(2,029,670)	(2,072,293)	(2,116,226)	Zulberti/Foran	Unit/Unit Cost	Does not apply	Does not apply	Does not apply	Historical data was used	See Schedule A & B	04/01/2016-03/31/2019
Mains & Svc	Customer Connections - Install Meter/Regulator	2,158,528	3,079,858	2,830,082	3,211,514	3,278,955	3,348,469	Zulberti/Foran	Unit/Unit Cost	Does not apply	Does not apply	Does not apply	Historical data was used	See Schedule A & B	04/01/2016-03/31/2019
Mains & Svc	Customer Connections - Fitting	5,030,008	5,435,077	4,994,292	5,667,431	5,786,427	5,909,099	Zulberti/Foran	Unit/Unit Cost	Does not apply	Does not apply	Does not apply	Historical data was used	See Schedule A & B	04/01/2016-03/31/2019
Mains & Svc	Customer Connections - Special Projects	(521,462)	1,489,725	-	-	-	-	Zulberti/Foran	Unit/Unit Cost	No projects were known at time of filing.	No projects were known at time of filing.	No projects were known at time of filing.	No projects were known at time of filing.	No projects were known at time of filing.	No projects were known at time of filing.
Meters/Hse Reg	Customer Connections - Meter Purchases		2,103,000	1,930,500	2,188,000	2,567,000	2,617,000	Khan	Unit/Unit Cost	N/A	Refer to Schedule C Exhibit 8	FY16-FY20	N/A	N/A	N/A
Mains & Svc	Gas System Reinforcement	4,968,732	5,839,278	3,436,158	8,620,067	5,168,520	5,571,800	Taddeo	Project Estimate/Unit Cost	For additional information related to this program/ project please refer to the attachment titled "White Papers"	N/A	N/A	N/A	Refer to Schedule D	N/A
Mains & Svc	STUN12247_Rexford_Rt 146_New Main and Regulator	186,129	2,500,000	15,494,000	70,000	-	-	Taddeo	Project Estimate	None	N/A	N/A	See Attachment 2 Schedule CC	N/A	N/A
Mains & Svc	STUN12350 Altamont_St Rt146_New Main	99,290	-	200,000	10,750,000	200,000	-	Taddeo	Project Estimate	None	N/A	N/A	See Attachment 2 Schedule CC	N/A	N/A
Mains & Svc	LTUN12375_Scotheneady_Uprate PL E36	23,162	1,560,722	-	-	-	-		Project Estimate	No Funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
Mains & Svc	PE Stamps Cost - Customer Connections				1,553,317	1,584,384	1,616,071		Project Estimate	No Funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
	Subtotal	**25,332,707**	**37,498,798**	**43,542,033**	**48,975,649**	**36,069,709**	**37,080,231**								
Mandated															
Mains & Svc	CSC/Public Works - Non-Reimbursable	5,702,385	6,646,253	6,918,749	7,066,138	7,214,507	7,367,456	Kudia	Historical Spend	Current trends and expected Economic impacts.	Does not apply	Does not apply	Historical data was used	Refer to Schedule A	04/01/2016-03/31/2019
Mains & Svc	Interstate I-81 Relocation		265,000	2,828,960	1,507,720	1,274,262	625,683	Striffler	Project Estimate	N/A	FY19: $255/ft FY18: 240/ft FY17: $275/ft	Dekathern's (blanket contract crew) per foot cost came to $255/ft based on three year average unit cost which was used in the estimate.	General unit rates and historical costs for past public works jobs were put together as costs for this job across the different fiscal years.	Spend FY19: $4,074,000 FY18: $8,066,000 FY17: $6,173,000 Footage Installed FY19: 15,955 ft. FY18: 33,550 ft. FY17: 22,367 ft.	FY 17, FY18 and FY 19
Mains & Svc	Replace Pipe on Bridges	323,320	1,094,000	1,028,000	1,050,000	1,071,000	1,093,000	Khan	Project Estimate	This program is reactive in nature. Corrosion identifies the locations of pipelines across elevated infrastucture on a three year cycle. We currently have a project that's complete but the charges are yet to hit the project. Its anticipated that the total spend on the project will be approximately $1.5M.	N/A	N/A	See Attachment 2 Schedule AA	N/A	Anticipated spend in FY21
Mains & Svc	Cross Bore Remediation	1,119,465	500,000	500,000	300,000	-	-	Khan	Unit/Unit Cost	The unit cost of the future years is expected to increase due to the shift of inspection types as the phase of the project matures. The first phase involves mainline inspections which are approximately $500/unit. The second phase involves push inspections which is approximately $1000/unit. The final phase of the project involves test pits which are $3000/unit. ratio of mainline to push inspection shifting towards push inspections which are more expensive. The push inspection unit price is approximately double that of a mainline inspection. Due to the unknown scope of inspections which will require an additional test hole to complete the inspection	Refer Schedule B Exhibit 1	This program started in FY18, so we used the data from FY18 to FY20 to develop budget.	N/A	N/A	N/A
Mains & Svc	Main Replacement (Proactive) - Leak Prone Pipe	50,976,679	59,942,001	58,265,759	67,296,951	69,315,860	71,395,336	Khan	Unit/Unit Cost	N/A	Refer Schedule B Exhibit 1	FY19 because it has the complete cost information (Additional Paving Requirements etc.)	N/A	N/A	FY19 because it has the complete cost information (Additional Paving Requirements etc.)
Mains & Svc	Large Diameter Main Rehabilitation		-	-	-	6,488,000	6,618,000	Khan	Unit and Unit Cost	This is a www program. Cost estimate of FY20 DNY lining project was used and adjusted for NMPC Op. Co.	Historic unit cost for KEDNY was used and adjusted for NMPC op. co. See Khan- Exhibits.	FY20 KEDNY lining historical data was provided in Khan- Exhibits.	N/A	N/A	N/A
Mains & Svc	Atmospheric Corrosion Inside Inspections (Remediation)	122,475	134,354	140,521	143,639	146,378	149,305	Khan	Project Estimate	None		Reactive work in line with FY20 total of 134,354		historicals; reactive program	FY20 134.4 FY19 47.1 FY18 120 FY17 134.3 FY16 71.4
Mains & Svc	Transmission Services	1,821,720	3,500,480	4,288,000	4,365,000	-	-	Khan	Unit and Unit cost	The budget was developed based on historical spends and the average installs and abandonments completed	Historic unit cost for KEDNY was used and adjusted for NMPC op. co. See Khan- Exhibits.	Refer to Schedule C Exhibit 10	N/A	N/A	N/A
Mains & Svc	Low Pressure Zones	758,856	945,820	2,000,000	2,500,000	3,000,000	3,000,000	Khan	Project Estimate				We anticipate installing/replacing 1.5 miles of main in rate year w/ithe ill increae to 2 miles in later years (Unit cost of proactive main replacement program)	Unit cost was based on proactive main replacement unit costs. FY19 Actual Spend $164,000, & FY20 Actual Spend $1,000,000	FY19 Actual Spend $164,000, & FY20 Actual Spend $1,000,000
Mains & Svc	Restrictions for Elevated Gas Infrastructure	118,877	1,093,820	750,000	765,000	780,000	796,000	Khan	Unit and Unit-Cost	We anticipate completing 40 locations at an average of $18,750 per location.	The contract price including change orders for the 47 locations in Syracuse and Watertown is $351,930.16 with internal overhead resulting in a price of roughly $10,000 per location. The increased costs per location is due to the area of future project locations and expected change orders. Permitting costs, travel costs for work crews, and additional overhead costs will all be increased.	Refer to Schedule C Exhibit 4	N/A	N/A	N/A
Mains & Svc	Service Replacements (Reactive) - Non-Leaks/Other	5,364,928	6,281,743	6,413,660	6,550,271	6,687,826	6,829,008	Khan	Historical Spend	reactive	Does not apply	Does not apply	Historical data was used	Refer to schedule B	04/01/2016-03/31/2019
Mains & Svc	Service Replacement (Reactive) - Leaks	2,084,385	3,312,910	3,382,481	3,454,528	1,527,073	1,601,847	Khan	Historical Spend	reactive	Does not apply	Does not apply	Historical data was used	Refer to schedule B	04/01/2016-03/31/2019
Mains & Svc	Main Replacement (Reactive) - Maintenance	907,660	942,998	962,801	983,309	1,003,958	1,025,242	Khan	Historical Spend	reactive	Does not apply	Does not apply	Historical data was used	Refer to schedule B	04/01/2016-03/31/2019
Mains & Svc	Proactive Low Pressure System Replacement		-	-	4,120,000	4,244,000	4,371,000	Khan	Unit cost and Unit	Unit cost was based on proactive main replacement unit costs. Refer to Khan-Exhibits	See unit cost historical data on Schedule C Exhibit 12	Refer to Schedule C - Exhibit 12	N/A	N/A	N/A
Mains & Svc	Contractor Safety Inspections		-	869,792	2,638,619	4,629,170	4,765,075	Crandall	Project Estimate	No additional	N/A	N/A	The enhanced safety incremental FTE count was determined by the total contractor crews required to perform the annual workplan. The historical data presented below reflects that approximately 30 total crews are required annually. The 26 FTEs would allow for a 1:1 supervision to contractor crew ratio. Although the 26 FTEs requested will not cover all 30 crews required by the annual workplan, the Company will use existing FTEs to bridge the gap. Historical crew data used to perform the annual workplan follows- "Fiscal Year/Approximate Crew Count" FY17/ 30 crews, FY18 / 27 crews, FY19 / 29 crews FY20 / 30 crews, FY21 / 29 crews	N/A	N/A
Mains & Svc	Pipeline Integrity IVP (Integrity Verification Program)	15,511,399	6,845,000	1,407,000	9,155,284	8,424,716	-	Kern	Project Estimate	New PHMSA rule making , MAOP Reconfirmation	NA	NA	Estimates for the program are zero based for each year. Individual estimates are based on actual cost for similar types of projects . 5 yr historical spend attached	5 year historical spend on Schedule C Exhibit 11	FY16 -- FY20
Mains & Svc	Pipeline Integrity IVP - PL 16 HCA Sections - Orange Commons			1,000,000	5,000,000	25,000,000	1,000,000	Kern	Project Estimate	NYS 255 Code Driven Project	NA	NA	Individual estimates are based on actual cost for similar types of projects .	N/A	N/A
Mains & Svc	Pipeline Integrity IVP - PL 16 HCA Sections - Valve 1607 to Northern Blvd			1,000,000	1,000,000	500,000	75,000,000	Kern	Project Estimate	NYS 255 Code Driven Project	NA	NA	Individual estimates are based on actual cost for similar types of projects .	N/A	N/A
Mains & Svc	Pipeline Integrity IVP - PL 16 HCA Sections - Valve 1603 to Lakeport Road			500,000	500,000	500,000	100,000	Kern	Project Estimate	NYS 255 Code Driven Project	NA	NA	Individual estimates are based on actual cost for similar types of projects .	N/A	N/A
Mains & Svc	Pipeline Integrity IVP - PL E18 Pipeline Replacement			-	2,500,000	2,500,000	20,000,000	Kern	Project Estimate	New PHMSA rule making , MAOP Reconfirmation	NA	NA	Individual estimates are based on actual cost for similar types of projects .	N/A	N/A
Mains & Svc	Pipeline Integrity IMP (Integrity Management Program)	13,798,602	24,939,640	26,975,000	14,657,356	28,005,284	20,930,000	Kern	Project Estimate	Project Estimate	IU Enablement now mandated in new PHMSA rule-making	NA	Estimates for the program are zero based for each year. Individual estimates are based on actual cost for similar types of projects . 5 yr historical spend attached	5 year historical spend on program attached	5 year historical spend on program attached
Mains & Svc	Transmission Pipeline Washout	2,347,286	507,820	521,000	500,000	500,000	500,000	Kern	Project Estimate		NA	NA	Estimate based on historical spend for program	5 year historical spend on program refer to Schedule C Exhibit 11	FY16 -- FY20
Mains & Svc	Transmission Pipeline (Reactive)	1,191,420	507,820	1,500,000	1,500,000	1,500,000	1,500,000	Kern	Project Estimate	Capital repairs generated by the IMP program	N/A	N/A	Estimate based on historical spend for program	5 year historical spend on program, refer to Schedule C Exhibit 11	FY16 -- FY20
Mains & Svc	Transmission Station Integrity			912,000	3,007,000	12,928,000	13,187,000	13,451,000	Greco	Project Estimate	This program considered the following factor: on October 1, 2019, USDOT issued the final rules relative to the proposed rulemakings, with an effective date of July 1, 2020. The mandates, advisory bulletin, notices, and final rules also apply to transmission-connected pressure regulating stations and take stations (hereafter, 'stations'). The Transmission Station Integrity Program (TSIP), consists of projects which focus on the rehabilitation, partial replacement, or full replacement of stations that do not meet the requirements of MAOP reconfirmation as set forth in the final rule. By July 2, 2035, the Company must attain 100 percent compliance for all transmission assets.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marieville GRS (FY20) - $2,441,308, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Mains & Svc	Valve Installation/Replacement	7,872	111,000	111,000	113,000	115,000	118,000	Taddeo	Historical Spend	None	N/A	N/A	N/A	Reactive Program, Value installation/replacement: FY20=$9,000, FY19=$59,000, FY18: $93,000; FY17= $80,000; FY16= $4,000	Prorated FY18 historial spend due to error in actuals within the catesgory over teh past two years
Mains & Svc	Sectionalizing District Implementation		1,000,000	3,700,000	3,793,000	3,887,000	3,984,000	Taddeo	Project Estimate	New dedicated program to re-baseline sectionalig districts. Refer to IR DPS-823	based on engineering and installing 100 new sectionalizing valves per year at an average cost of $37K per valve	N/A	N/A	N/A	N/A
Meters/Hse Reg	Purchase Meters (Replacements)	6,946,822	6,428,000	6,556,000	6,688,000	7,844,000	8,002,000	Avery	Project Estimate	N/A	Refer to Schedule C Exhibit 6 & 7	FY16-FY20	N/A	N/A	N/A
Meters/Hse Reg	Install Elevated Pressure Meter Correctors	1,015,837	946,820	-	-	-	-	Mike Avery 8-4	Project Estimate	No Funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
Meters/Hse Reg	Inactive Accounts			749,190	1,929,164	1,987,039	2,046,650	Sano	Project Estimate	The Company considered reducing our current 60 day inactive account process timeframe to 45 days in rate 1 and 30 days in rate year 2 and beyond.	N/A	N/A	Refer to DPS 729	N/A	N/A
Meters/Hse Reg	ERT Replacement		1,660,000	2,300,000	2,500,000	2,000,000	2,000,000	Khan	Project Estimate	New Program	N/A	N/A	The project estimate includes material, labor ,taxes and overheads to carry out a large scale ERT Replacement program. Material is estimated to be the same as ERT's as part of the meter replacement programs, and installation of these assets are inline with typical CMS installation costs to replace in the field. There are also project management related toocts to monitor and ensure compliance with program requriements. The total number of units forecasted to be replaced relates to the anticipated failure rate of the ERT, based on age, from the manufacturer.	N/A	N/A
Meters/Hse Reg	Meter Changes	3,874,034	5,063,380	4,739,680	4,839,210	4,940,840	5,044,590	Sano	Project Estimate	The program is the labor required to replace gas meters that are retired from service due to periodic testing, damage, failure, or any other reason.	N/A	N/A	N/A	FY16=$4.7M, FY17=$4.2, FY18=$2.7M, FY19=$4.5M, FY20=$4.5M	FY16,FY17,FY18,FY19,FY20
Mains & Svc	Corrosion	1,058,300	2,365,240	2,533,000	2,578,000	2,627,000	2,679,000	VanPelt	Historical Spend	PHMSA Plastic rule	N/A	N/A	N/A	Dollars in Millions CY18 - CAPEX $1.826 OPEX $2.575 CY19- CAPEX $2.082 OPEX $2.652 CY20 -CAPEX $2.124 OPEX $2.731 CY21 - CAPEX $2.126 OPEX $2.814 CY22 - CAPEX $2.210 OPEX $2.898	2017
Mains & Svc	Operator Qualifications testing		170,642	32,331	33,139	33,967	34,817	Sheth	Project Estimate	In Support of NYS PSC OQ White Paper Best Practice Implementation	Based on FY21 cost	January 2019-March 2020	Estimation is based on # of employees required to be tested for OQ	N/A	N/A
Mains & Svc	PE Stamps Cost - Mandated		-	-	2,355,466	2,402,575	2,450,626	Backus	Project Estimate	No funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
	Subtotal	**115,056,820**	**136,116,800**	**144,979,924**	**175,310,774**	**215,336,455**	**270,478,236**								
Reliability															
Meas. & Reg	Mapboard Replacement		-	-	-	560,000	-	Delaney	Project Estimate	No funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
Meas. & Reg	Gas Control Telemetry Upgrade 3G/4G	35,011	-	-	-	-	-	Delaney	Project Estimate	No funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A

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Mains & Svc	LTUN12251-Albany Loop Closure	1,872,388	775,000	775,000	750,000	4,000,000	40,000,000	Taddeo	Project Estimate	Refer to White Paper; see previous response to DPS-754 and PACE AGREE-050	N/A	N/A	The project estimate for the Albany Loop project in the rate year is based on ongoing activity to permit the construction of the project. This includes engineering and permitting authority reviews as well as AFUDC costs associated with the design, engineering and permitting activities to date. National Grid continues to work with the interested permitting entities for this project to reach a resolution regarding open issues so that the reliability gains that this project provides can be achieved.	N/A	N/A
Mains & Svc	LTUN_Gas System Reliability - Gas Planning/RCV Programs	2,820,563	619,000	2,569,621	4,430,099	2,921,187	5,239,032	Taddeo	Project Estimate	Refer to White Paper	N/A	N/A	Refer to Schedule D	N/A	N/A
Mains & Svc	LTUN10918_Rotterdam_ Duanesburg Rd		3,420,705	-	-	-	-	Taddeo	Project Estimate	No funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
Mains & Svc	LTUN-TBD-Flow control valve at Wolf Gate		3,347,328	-	-	-	-	Taddeo	Project Estimate	No funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
Mains & Svc	LTUN12243_Rome_Oneida Station_RCV		-	-	-	2,184,451	-	Taddeo	Project Estimate	No funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
Meas. & Reg	Heater Installation Program	894,985	1,997,440	2,315,000	2,314,000	2,147,000	2,349,000	Greco	Project Estimate	This program considers the heater replacements selected for replacement to be coordinated with any transmission station work that is taking place as part of the Transmission Station Integrity program.	N/A	N/A	An excel based cost estimating tool was used to develop the individual cost estimate this program was based on, and a recent heater replacement project at GRS 158, Moyers Corners, can be referenced as actual anticipated costs from this program for a single heater replacement. Historical spend and recent projects can confirm other Burner Management System(BMS) heater upgrades that have been completed.	Five years of historical data was not available however, the recently completed project at Moyers Corners can be used as reference for an individual heater replacement (FY20) - $588,079 For individual component (BMS) upgrades the following can be referenced: Croghan Take Station, $48,089.40 Patrick Rd, $33,595.50 Reuhrk, Carthage, $41,871.50 Lamphere Road (CWT), $120,267.55 Rowland Street, $44,776.71 Ballston Lake, $53,184.49 Chittenango, $48,750.53 Mohican Street (CWT), $104,473.89	Moyers Corners individual heater replacement was completed in FY20. FY19 & FY20 actual costs were used for replacement of individual Heater components (BMS upgrades).
Meas. & Reg	Pressure Regulating Facilities	2,481,993	4,117,000	5,567,000	5,690,000	5,801,000	5,909,000	Greco	Project Estimate	This is a long-standing program to improve our gas regulator stations based upon risk.	N/A	N/A	The program budget was developed based upon historical individual station replacement costs.	Five years costs of individual station replacements: N. 3rd St $ 661,520.41 Bridge Ave $ 943,281.16 18th Street $ 802,292.75 25th Street $ 496,665.56 Burnett $ 729,620.22 Union $ 850,053.94 Curry $ 626,328.36 Grant $ 841,622.64 Conkling $ 610,830.89 Elizabeth $ 746,286.36 Luther $850,293 Walworth $ 709,599 W Dominick $ 579,528	FY16-FY20
Meas. & Reg	Pressure Reg Station - Washington Mills - GRS 824-043	434,993	2,330,000	30,000	-	-	-	Greco	Project Estimate	This funding considered the transmission station replacement project completed in the prior year and is closeout costs. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Marraville Road Rotterdam - GRS 924-6	2,528,999	76,800	-	-	-	-	Greco	Project Estimate	N/A	N/A	N/A			
Meas. & Reg	Pressure Reg Station - Old Campion Road GRS 824-688		46,800	459,000	3,120,000	85,000	-	Greco	Project Estimate	This funding considered the transmission station replacement project planned in the upcoming year and is for project development, construction, and closeout. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Oneida Supply - GRS 824-709	366,812	2,491,000	82,000	-	-	-	Greco	Project Estimate	This funding considered the transmission station replacement project completed in the prior year and is closeout costs. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Cold Springs Rd - GRS 824-127	20,783	496,800	-	83,000	-	-	Greco	Project Estimate	This funding considered the transmission station replacement project completed in the prior year and is closeout costs. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Washington & Fuller - GRS 924-313	24,430	446,800	3,060,000	83,000	-	-	Greco	Project Estimate	This funding considered the transmission station replacement project planned in the upcoming year and is for project development, construction, and closeout. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Sandy Creek GRS 824-216A, 216B		46,800	459,000	3,120,000	85,000	-	Greco	Project Estimate	This funding considered the transmission station replacement project planned in the upcoming year and is for project development, construction, and closeout. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Valentine Rd GRS 924-452		-	-	52,000	477,000	3,240,000	Greco	Project Estimate	This funding considered the transmission station replacement project planned in the upcoming year and is for project development, construction, and closeout. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Delaware Ave GRS 924-402		-	50,000	468,000	3,180,000	86,000	Greco	Project Estimate	This funding considered the transmission station replacement project planned in the upcoming years and is for project development. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Yorkville GRS 824-644		-	50,000	468,000	3,180,000	86,000	Greco	Project Estimate	This funding considered the transmission station replacement project planned in the upcoming years and is for project development. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Dams Corners GRS 824-697		-	-	52,000	477,000	3,240,000	Greco	Project Estimate	This funding considered the transmission station replacement project planned in the upcoming years and is for project development. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Brookview GRS 924-336	1,281,356	96,800	-	-	-	-	Greco	Project Estimate	N/A	N/A	N/A			
Meas. & Reg	Pressure Reg Station - Harbor Point GRS 824-637		-	-	-	-	53,000	486,000	Greco	Project Estimate	This funding considered the transmission station replacement project planned in the upcoming years and is for project development. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Shellstone GRS 924-815	77,090	-	51,000	468,000	3,180,000	86,000	Greco	Project Estimate	This funding considered the transmission station replacement project planned in the upcoming years and is for project development. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marraville GRS (FY20) - $2,441,398, and Brookview GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.

Classification	Category	Historic Test Year	Fiscal Year 21	Rate Year	Data Year 1	Data Year 2	Data Year 3	Responder	1. Identify how the Rate Year budget was developed (e.g., unit and unit cost, project estimate or historical spend).	2. Identify any additional anticipated new requirements, new programs, and projects or other known factors that the Company considered in the development of the Rate Year budget.	3. If a unit and unit cost basis was used, provide five years of historic data by fiscal year (units, unit costs, and historic expenditures).	4. If a unit and unit cost basis was used, identify the time period the Company relied on to develop its Rate Year budget.	5. If a project estimate was used, explain how the estimate was developed and provide any historical experience by fiscal year that the Company believes supports finding that the Rate Year budget is reasonable.	6. If a historical spend basis was used, provide five years of historic data by fiscal year.	7. If a historical spend basis was used, identify the time period the Company relied on to develop its Rate Year budget.
Meas. & Reg	Pressure Reg Station - Ellisburg GRS 824-308	-	-	-	52,000	477,000	3,240,000	Greco	Project Estimate	This funding considered the transmission station replacement project planned in the upcoming years and is for project development. As part of the project initiation, this project considered the upcoming 100% MAOP reconfirmation requirements as part of the Transmission Station integrity program, but was ultimately selected based upon other risk factors.	N/A	N/A	This program budget was developed by a combination of historical transmission station project estimates and the Gas Project Estimating CostBook Tool (Microsoft Access). Within the last 3 years Transmission Station projects has been routed through the Capital Delivery Process. This process distributes the spend on a project across 4 years; Y1 - Project Development, Y2 - Design/Procurement, Y3 - Procurement/Construction, Y4 - Project Closeout.	Five years of historic data is not representative of cost increases that have occured over the past years due to increased business costs, execution costs, and development costs, therefore 3 years of historical data is a more accurate representation. The historical spend that this budget was partly based on is from the following; Elton Ave GRS (FY18/19) - $4,793,3030, Alplaus GRS (FY19) - $3,612,264, Marisville GRS (FY20) - $2,441,398, and Brewlovine GRS (FY20) - $4,409,486.	FY18, FY19, and FY20 Transmission Station projects were referenced to develop the Rate Year Budget.
Meas. & Reg	Pressure Reg Station - Alplaus Station Rebuild	10,717	-	-				Greco	Project Estimate	N/A	N/A	N/A			
Meas. & Reg	Pressure Reg Station - OPP Vickerman Hill GRS-824-757	10,533		-				Greco	Project Estimate	N/A	N/A	N/A			
Meas. & Reg	Renewable Natural Gas (RNG) Interconnections		459,000	468,000	478,000	487,000	994,000	Greco	Project Estimate	None	No historical data, new program	No historical data, new program	Estimate was developed using quotes from analyser vendors commonly used by the Company.	No historical data, new program	No historical data, new program
Meas. & Reg	Gate Station Over Pressure Protection		720,000	2,499,000	1,872,000	-	-	Greco	Project Estimate	This funding considers the requirement to have National Grid Company-owned over pressure protection at all 24 take stations. Currently 19 of 24 stations require addition of Company-owned OPP.	N/A	N/A	This program budget was developed referencing the Gas Project Estimating CostBook Tool (Microsoft Access). OPP at take stations could elicit a varying cost range of $100,000 - $500,000 per station, dependent on size of the equipment and the extent of piping rework required.	Five years of historical data was not available however, the recently completed project at Shellstone can be used as reference (FY21) - $113,229.	Shellstone was completed in FY21.
Meas. & Reg	System Automation	503,745	995,000	1,343,000	1,369,000	1,395,000	1,422,000	Greco	Project Estimate	This program takes into consideration upcoming gas regulator station replacements to determine which stations to install monitoring and controlling capabilities. The goal of this program is to install system automation at approximately 20-25 sites per fiscal year.	N/A	N/A	This program budget was developed by a combination of historical system automation projects and collaboration with Gas Project Estimating's Excel tool. Based on these tools the cost per site was approximately $58,000 including labor and materials.	Previous fiscal year actual spend; FY16 - $218,319, FY17 - $299,402, FY18 - $1,321,617, FY19 - $767,985, FY20 - $365,000.	FY16, FY17, FY18, FY19, and FY20 System Automation actual spend were referenced to develop the Rate Year Budget.
Meas. & Reg	Distribution Station Over Pressure Protection		1,025,000	763,000	778,000	529,000	540,000	Greco	Project Estimate	This program focuses on the installation of override pilots at regulator stations where external control lines are susceptible to third-party damage or isolation that could result in an overpressure scenario.	N/A	N/A	This program budget was developed with the goal of installing overpressure protection at all 67 M/C stations in the next two years. A high level individual project estimate, assumes: Material Cost = $1,500 (tees, tubing, pilots), Labor Cost = $10,000, Overhead Costs (25%) = $2,875.	N/A	N/A
Meas. & Reg	Odorant Vapor Management at Gate Stations		-	50,000	200,000	200,000	150,000	Zielinski	Project Estimate	In the event of a spill or release of mercaptan, this project's intention is to install specialized equipment that will contain mercaptan odors to inside the odorant injection facility. Raw odorant is purposely meant to be extremely potent which allows the public the ability to smell low volume gas leaks. However, performing maintenance on odorant injection equipment becomes difficult due the nature of such a strong odor, increasing the risk of large numbers of false odor complaints should vapors escape to the ambient air. National Grid has investigated options available throughout the industry to handle this issue. The project is comprised of three main initiatives; the installation of a vacuum filtration device, sealing the concrete floors to allow for proper clean up of spills, and the installation of mercaptan detector to allow Gas Control to remotely detect mercaptan releases.	A unit cost analysis was not used to derive this project	A unit cost analysis was not used to derive this project	There are no recent historical costs associated with conducting this type of work. Therefore, vendor quotes were obtained for the vacuum filtration device. The labor associated with the installation was estimated. Estimates were also used for the sealing of the floors and for the methane detection equipment. refer to Schedule F.	A historical spend was not used to derive this project	A historical spend was not used to derive this project
Meas. & Reg	CNG - NIMO Blanket	597,527	-	200,000	200,000	200,000	200,000	Greco	Project Estimate	The Company developed this program to secure funding to perform capital upgrades for obsolete or malfunctioning CNG equipment throughout the NiMo service area. Currently National Grid has two fueling stations that are greater than 10 years old. This program is reactive in nature and ensures National Grid can ensure the safe operation of the CNG fueling systems.	N/A	N/A	N/A	The Company does not have relevant data in the NMPC operating company. However, the company was able to rely on historical spends for a comparable program for two similar facilities in downstate NY over the last two fiscal years. FY19: $98K, FY20: $174K.	FY19, FY20 were utilized to develop these forecasts.
Mains & Svc	Water Intrusion	196,173	443,320	1,008,357	1,030,731	1,050,386	1,071,393	Khan	Project Estimate	N/A	N/A	N/A	Water intrusion program is reactive in nature, an estimate of ~5M is in line with expectations for future work, based on previous experience and anticipated workload.	N/A	N/A
Meas. & Reg	I&R - Reactive	589,193	339,320	307,381	314,201	320,192	326,596	Zielinski	Historical Spend	Budget is based on historical spending patterns.	N/A	N/A	N/A	Refer to Response to DPS-955	Previous 5 years. Note that 4th quarter FY-20 and first 2 quarters FY-21 impacted by Covid-19. Refer to Schedule G Exhibit 4
Meas. & Reg	Gas Regulator Station Security	1,442,647	1,612,000	600,000	600,000	600,000	600,000	Zielinski	Project Estimate	None	N/A	N/A	Refer to Schedule E	N/A	N/A
Meas. & Reg	Critical Spares		-	500,000	250,000	150,000	100,000	Zielinski	Project Estimate	National Grid's gas infrastructure contains a large variatly of components and equipment, many of which are complex or designed specifically for individual locations or purposes. In order to ensure reliability and system safety, the Company must maintain a sufficient inventory of complex or long lead time compents to manage emergency situations or to facilitate timely repairs. This initiative will supply the necessary funding to ensure long lead time or complex gas system components are readily available.	A unit cost analysis was not used to derive this project	A unit cost analysis was not used to derive this project	During the development of this project a list of long lead time equipment was developed. From this list, items were then evaluated as to their criticality. Items that were deemed crucial for the continuous flow of gas to the customers were sectionalized in a list that would be included in this program. Costs for the program were estimated using quotes, worksheets, and historical spending. The intent of the program is to sequester long lead time and complex components for use during emergencies.	A historical spend was not used to derive this project	A historical spend was not used to derive this project
Meas. & Reg	Oil Seal Replacement		-	1,640,000	1,640,000	1,640,000	1,640,000		Project Estimate	This initiative was developed to replace aging and outdated oil seals. Oil seals are a form of overpressure protection that uses the weight of oil to contain gas pressure inside of a pipe. In the event of an overpressure situation an the subsequent operation of an oil seal, the oil is displaced and allows gas to safely release to the atmosphere keeping pipeline pressure at safe levels. Oil seals do not have the ability to automatically close and must be manually reset, even if the overpressure condition is resolved. Replacing oils seals with newer forms of overpressure protection that will modulate and automatically reset reduces emissions of methane and oily aerosols to atmosphere and provide improved environmental benefits.	A unit cost analysis was not used to derive this project	A unit cost analysis was not used to derive this project	This estimate was created by National Grid's estimating department using National Grid's Gas Project Estimating Tool.	A historical spend was not used to derive this project	A historical spend was not used to derive this project
Meters/Hse Reg	Smart Residential Methane Detector Program		-	-	4,779,000	11,196,000	21,786,000	Khan	Project Estimate	New Program	N/A	N/A	See DPS 829	N/A	N/A
Meters/Hse Reg	Smart Gas Meter AMI Integration		-	-	-	2,520,000	2,382,000	Khan	Project Estimate	New Program	N/A	N/A	See DPS 829	N/A	N/A
Meters/Hse Reg	Low Pressure Zone Smart Meter Program		-	-	-	1,435,000	5,650,000	Khan	Project Estimate	New Program	N/A	N/A	See DPS 829	N/A	N/A
Meas. & Reg	Methane Emmission Reduction	29,089	830,800	-	-	-	-	Khan	Project Estimate	No funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
Meas. & Reg	Watertown Sewalls Island Project	85,940						Kern	Project Estimate	No funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
Meas. & Reg	PE Stamps Cost - Reliability	-	-	-	41,416	42,448	43,297	Backus	Project Estimate	No funding was requested in the rate year at the time of filing	N/A	N/A	N/A	N/A	N/A
	Subtotal	**16,325,068**	**26,732,733**	**24,846,359**	**34,702,647**	**52,574,665**	**100,875,233**								
Non-Infrastructure															
Gen Equip	Tools & Equipment - All	573,780	840,000	1,086,000	1,110,000	3,306,000	1,154,000	Dyer	Project Estimate	N/A	N/A	N/A	The project estimate is based on 3 year historic cost average ($1,014,324) adjusted for inflation	FY16 - $686,206 FY17 - $949,857 FY18 - $1,018,000 FY19 - $1,007,381 FY20 - $891,000	FY17-19
Meters/Hse Reg	AMI		-	-	502,688	2,758,338	19,583,612	32,885,330	Mokey	Please see the response to DPS-955, question 2.	Please see the response to DPS-955, question 2.	Please see the response to DPS-955, question 2.	Please see the response to DPS-955, question 2.	Please see the response to DPS-955, question 2.	Please see the response to DPS-955, question 2.
Gen Equip	Learning and Development - Materials, Tools and Equipment				375,000	250,000	187,500	187,500	Ackermann	Project Estimate	1) Need for maintenance on existing equipment. (2) Need for new and additional equipment to augment existing. (3) Need for new equipment due to the GTTT and resulting increased compliance requirements. (4) Anticipated need to accommodate increased measures called for in the NYSPSC White paper. (5) Increased need for resources to commence Contractor Training	N/A- Vendor equipment costs, parts, maintence and repair estimates used.	N/A- Vendor equipment costs, parts, maintence and repair estimates used.	N/A- Vendor equipment costs, parts, maintence and repair estimates used.	N/A- Vendor equipment costs, parts, maintence and repair estimates used.	N/A- Vendor equipment costs, parts, maintence and repair estimates used.
Meters/Hse Reg	Meter Testing Equipment	839,023	204,000	106,120	108,240	110,410	112,618	Khan	Project Estimate	Historical spend included in Exhibit Section J. the estimate is developed by understnading what tools and equipment the meter lab must purchase to ensure compliance to meter testing code requirements.	N/A	N/A	Historical spend included in Exhibit Section J. The estimate was developed by understanding what tools and equipment the meter lab must purchase to ensure compliance to meter testing code requirements.	N/A	N/A
	Subtotal	**1,212,803**	**1,044,000**	**2,060,808**	**4,226,558**	**23,187,322**	**34,339,450**								
	Total Capital Including Cost of Removal	**157,927,397**	**201,392,511**	**215,438,124**	**263,215,627**	**327,168,351**	**462,773,236**								
Mains & Svc	Cost of Removal	5,954,541	8,055,692	8,617,525	10,528,625	13,086,734	17,710,929								
	Total Capital (Net of Removal)	**151,972,855**	**193,336,819**	**206,820,599**	**252,687,002**	**314,081,617**	**425,062,306**								

Exhibit 1
Current Unit UC Calculations

		FY21	FY22	FY23	FY24	FY25
Customer Connections - Install Main						
FY19 Unit Cost	$ 55					
Inflated to FY21	$ 57	$ 7,653,383				
Inflated to FY22	$ 61		$ 6,732,164			
Inflated to FY23	$ 62			$ 8,181,532		
Inflated to FY24	$ 63				$ 8,371,028	
Inflated to FY25	$ 65					$ 8,515,047
FY21 Units	133716					
Inflated to FY22 and adjusted for economic trend	110858					
Inflated to FY23	131915					
Inflated to FY24	132195					
Inflated to FY25	131677					
Customer Connections - Install Services						
3 Year Average (FY17-19) - Inflated (Unit Cost)	$ 4,152					
Inflated to FY21	$ 4,327	$ 9,784,219				
Inflated to FY22	$ 4,504		$ 9,743,418			
Inflated to FY23	$ 4,600			$ 10,763,478		
Inflated to FY24	$ 4,697				$ 11,185,689	
Inflated to FY25	$ 4,796					$ 11,618,970
FY21 Units	2261					
Inflated to FY22 and adjusted for economic trend	2163					
Inflated to FY23	2340					
Inflated to FY24	2382					
Inflated to FY25	2423					
Customer Connections - Customer Contributions						
3 Year Average (FY17-19) - Inflated	$ (1,868,008)					
Inflated to FY21	$ (1,946,464)	$ (1,946,464)				
Inflated to FY22 and adjusted for economic trend	$ (1,788,606)		$ (1,788,606)			
Inflated to FY23	$ (2,029,670)			$ (2,029,670)		
Inflated to FY24	$ (2,072,293)				$ (2,072,293)	
Inflated to FY25	$ (2,116,226)					$ (2,116,226)
Customer Connections - Fitting						
3 Year Average (FY17-19) - Inflated	$ 5,216,004					
Inflated to FY21	$ 5,435,077	$ 5,435,077				
Inflated to FY22 and adjusted for economic trend	$ 4,994,292		$ 4,994,292			
Inflated to FY23	$ 5,667,411			$ 5,667,411		
Inflated to FY24	$ 5,786,427				$ 5,786,427	
Inflated to FY25	$ 5,909,099					$ 5,909,099
Customer Connections - Install Meter / Regulator						
3 Year Average (FY17-19) - Inflated	$ 2,955,718					
Inflated to FY21	$ 3,079,858	$ 3,079,858				
Inflated to FY22 and adjusted for economic trend	$ 2,830,082		$ 2,830,082			
Inflated to FY23	$ 3,211,514			$ 3,211,514		
Inflated to FY24	$ 3,278,955				$ 3,278,955	
Inflated to FY25	$ 3,348,469					$ 3,348,469
CSC/Public Works						

3 Year Average (FY17-19) - Inflated	$ 6,378,361					
Inflated to FY21	$ 6,646,253	$ 6,646,253				
Inflated to FY22	$ 6,918,749		$ 6,918,749			
Inflated to FY23	$ 7,066,118			$ 7,066,118		
Inflated to FY24	$ 7,214,507				$ 7,214,507	
Inflated to FY25	$ 7,367,454					$ 7,367,454
Main Replacement (Proactive) - Leak Prone Pipe						
FY19 Unit Cost	$ 232					
Inflated to FY21	$ 246	$ 59,942,061				
Inflated to FY22	$ 268		$ 58,265,759			
Inflated to FY23	$ 276			$ 67,296,951		
Inflated to FY24	$ 284				$ 69,315,860	
Inflated to FY25	$ 292					$ 71,395,336
FY21 Units	244094					
FY22 Units and adjusted for economic trend	217677					
FY23 Units	244094					
FY24 Units	244094					
FY25 Units	244094					
Main Replacement (Reactive) Maintenance						
3 Year Average (FY17-19) - Inflated	$ 904,989					
Inflated to FY21	$ 942,998	$ 942,998				
Inflated to FY22	$ 962,801		$ 962,801			
Inflated to FY23	$ 983,309			$ 983,309		
Inflated to FY24	$ 1,003,958				$ 1,003,958	
Inflated to FY25	$ 1,025,242					$ 1,025,242
Service Replacement (Reactive) - Leaks						
3 Year Average (FY17-19) - Inflated	$ 3,179,376					
Inflated to FY21	$ 3,312,910	$ 3,312,910				
Inflated to FY22	$ 3,382,481		$ 3,382,481			
Inflated to FY23	$ 3,454,528			$ 3,454,528		
Inflated to FY24	$ 3,527,073				$ 3,527,073	
Inflated to FY25	$ 3,601,847					$ 3,601,847
Service Replacement (Reactive) - Non-Leaks/Other						
3 Year Average (FY17-19) - Inflated	$ 6,028,544					
Inflated to FY21	$ 6,281,743	$ 6,281,743				
Inflated to FY22	$ 6,413,660		$ 6,413,660			
Inflated to FY23	$ 6,550,271			$ 6,550,271		
Inflated to FY24	$ 6,687,826				$ 6,687,826	
Inflated to FY25	$ 6,829,608					$ 6,829,608

Exhibit 1
Historial Data FY16-20

	Customer Connections - Install Main (Incl. NEP)				
	FY16	**FY17**	**FY18**	**FY19**	**FY20**
Actuals	$ 8,571,849	$ 7,384,304	$ 5,222,701	$ 4,703,665	$ 6,304,130
Units	207693	172442	146700	97474	127102
Unit Cost	$ 41	$ 43	$ 36	$ 48	$ 50

	Customer Connections - Install Services (Incl. NEP)				
	FY16	**FY17**	**FY18**	**FY19**	**FY20**
Actuals	$ 12,850,570	$ 13,351,133	$ 10,242,575	$ 9,792,144	$ 9,557,412
Units	3422	3259	2643	2591	2470
Unit Cost	$ 3,755	$ 4,097	$ 3,875	$ 3,779	$ 3,869

	Customer Connections - Customer Contributions				
	FY16	**FY17**	**FY18**	**FY19**	**FY20**
Actuals	$ (1,977,299)	$ (1,223,537)	$ (1,629,000)	$ (2,587,518)	$ (1,149,000)

	Customer Connections - Fitting				
	FY16	**FY17**	**FY18**	**FY19**	**FY20**
Actuals	$ 6,589,118	$ 6,208,336	$ 4,752,000	$ 4,102,696	$ 5,325,000

	Customer Connections - Install Meter / Regulator				
	FY16	**FY17**	**FY18**	**FY19**	**FY20**
Actuals	$ 3,237,712	$ 3,715,841	$ 2,653,000	$ 2,159,243	$ 2,673,000

	CSC/Public Works				
	FY16	**FY17**	**FY18**	**FY19**	**FY20**
Actuals	$ 7,603,310	$ 6,168,364	$ 8,184,000	$ 4,073,287	$ 5,621,000
Units	29370	21157	33550	15955	10517
Unit Cost	$ 259	$ 292	$ 244	$ 255	$ 534

	Main Replacement (Proactive) - Leak Prone Pipe				
	FY16	**FY17**	**FY18**	**FY19**	**FY20**
Actuals	$ 28,928,466	$ 44,305,854	$ 50,267,245	$ 59,886,445	$ 52,006,975
Units	183486	222414	254788	258500	236697
Unit Cost	$ 158	$ 199	$ 197	$ 232	$ 220

	Main Replacement (Reactive) Maintenance				
	FY16	**FY17**	**FY18**	**FY19**	**FY20**
Actuals	$ 1,036,083	$ 1,435,901	$ 682,000	$ 483,325	$ 1,003,000

	Service Replacement (Reactive) - Leaks				
	FY16	**FY17**	**FY18**	**FY19**	**FY20**
Actuals	$ 3,939,257	$ 4,010,073	$ 3,095,000	$ 2,062,238	$ 2,430,000

	Service Replacement (Reactive) - Non-Leaks/Other				
	FY16	**FY17**	**FY18**	**FY19**	**FY20**
Actuals	$ 3,897,056	$ 4,693,727	$ 6,502,000	$ 6,298,167	$ 4,804,000

Exhibit 1 Replacement Pipe on bridges

CBC FY	Actual	Budget
FY20	349	1,575
FY19	33	-
FY18	1	-

Dolgeville Proj	126	1,511

Exhibit 2 Cross Bore Remediation

	Units Completed	Total Spend	FY Unit Cost
FY18 (Apr17-Mar18)	317	150,000	473
FY19	1,001	620,000	619
FY20	1,109	989,000	892
3 year average	2,427	1,759,000	725
FY21	400	500,000	1,250
FY22	450	500,000	1,111
FY23	250	300,000	1,200

Exhibit 3 Large Diameter main Rehabilitation

KEDNY Lining	Miles Lined	Spend ($)	$/miles
FY20	1	13,272,000	8,907,383

UNY Lining	FY23	FY24
Miles	1	1

Exhibit 4 Restrictions for Elevated Gas Infrastructure

FY20	
Spend	351,930
Units	47
$/unit	7,488

Exhibit 5 Pipeleine 16, Orange Commons

Pipeline 34 was recently completed, a 10 mile replacement,cross country, undeveloped area, 10-inch pipe, largely reused the same right-of-way
Cost of PL34 was approximately $6M/mile

Pipeline 16, Orange Commons is 24-inch diameter pipe, approximately 6000 feet which crosses a State highwayand then runs througha brand new suburban development
Increased costs due to larger diameter pipe, new more equipment ,more welders,difficult construction if reusing the same ROW, costs to aquire new right-of-way, state high way crossing
Increases

larger diameter assume construction is 4 x PL34	$24 M
cost of pipe	$1M
aquire new ROW	$1M
state highway crossing HDD	$2M
contingency 15%	$4.2M
	$32.4M

Exhibit 6

Historic Spend	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Customer connections – Meter Purchases	$ 1,424,842	$ 1,751,847	$ -	$ -	$ -
Purchase Meters (Replacements)	$ 3,663,880	$ 4,504,749	$ 6,609,298	$ 4,964,476	$ 6,856,868
Install Elevated Pressure Correctors	$ -	$ -	$ -	$ 590,466	$ 1,015,546
Meter Testing Equipment	$ -	$ -	$ 255,085	$ 106,561	$ 611,953

Units	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Customer connections – Meter Purchases	3,122	4,708	-	-	-
Purchase Meters (Replacements)	8,028	12,107	22,143	24,751	19,024
Install Elevated Pressure Correctors	-	-	-	207	205

Unit Cost	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Customer connections – Meter Purchases	$ 456	$ 372	$ -	$ -	$ -
Purchase Meters (Replacements)	$ 456	$ 372	$ 298	$ 201	$ 360
Install Elevated Pressure Correctors	$ -	$ -	$ -	$ 2,852	$ 4,954

Note: Customer Connections and Purchase Meter units and costs all included in Purchase Meter line item for FY18-FY20

Exhibit 7 Q4 Meter Purchase Replacements

	FY21	FY22	FY23	FY24	FY25
Units	$ 20,091	$ 20,091	$ 20,091	$ 20,091	$ 20,091
Dollars	$ 6,428,000	$ 6,556,000	$ 6,688,000	$ 7,844,000	$ 8,002,000
Unit Cost	$ 320	$ 326	$ 333	$ 390	$ 398

FY22 Meter Purchase Replacement Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate
Units Required	17,090	2,350	321	330	300	26,700	19%	31%
Unit Cost	$ 78.59	$ 126.48	$ 473.28	$ 1,269.90	$ 1,836.00	$ 54.06		
Total Cost	$ 1,343,103	$ 297,228	$ 151,923	$ 419,067	$ 550,800	$ 1,443,402	$ 799,049	$ 1,551,417
						FY22 Program Total		$ 6,555,990

FY23 Meter Purchase Replacement Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate
Units Required	17,090	2,350	321	330	300	26,700	19%	31%
Unit Cost	$ 80.16	$ 129.01	$ 482.75	$ 1,295.30	$ 1,872.72	$ 55.14		

Total Cost	$ 1,369,965	$ 303,173	$ 154,961	$ 427,448	$ 561,816	$ 1,472,270	$ 815,030	$ 1,582,446
						FY22 Program Total		$ 6,687,110

FY24 Meter Purchase Replacement Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate
Units Required	17,090	2,350	321	330	300	26,700	19%	31%
Unit Cost	$ 120.20	$ 131.59	$ 492.40	$ 1,321.20	$ 1,910.17	$ 56.24		
Total Cost	$ 2,054,218	$ 309,236	$ 158,061	$ 435,997	$ 573,052	$ 1,501,715	$ 956,133	$ 1,856,408
						FY22 Program Total		$ 7,844,821

FY25 Meter Purchase Replacement Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate
Units Required	17,090	2,350	321	330	300	26,700	19%	31%
Unit Cost	$ 122.60	$ 134.22	$ 502.25	$ 1,347.63	$ 1,948.38	$ 57.37		
Total Cost	$ 2,095,302	$ 315,421	$ 161,222	$ 444,717	$ 584,513	$ 1,531,750	$ 975,256	$ 1,893,536
							FY22 Program Total	$ 8,001,717

Exhibit 8 FY22 Meter Purchase Growth Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate
Units Required	5,600	550	292	131	100	7,000	19%	31%
Unit Cost	$ 78.59	$ 126.48	$ 473.28	$ 1,269.90	$ 1,836.00	$ 54.06		
Total Cost	$ 440,104	$ 69,564	$ 138,198	$ 166,357	$ 183,600	$ 378,420	$ 261,486	$ 507,696
						FY22 Program Total		$ 2,145,425

FY22 Meter Purchase Growth Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate
Units Required	5,600	550	292	131	100	7,000	19%	31%
Unit Cost	$ 80.16	$ 129.01	$ 482.75	$ 1,295.30	$ 1,872.72	$ 55.14		
Total Cost	$ 448,906	$ 70,955	$ 140,962	$ 169,684	$ 187,272	$ 385,988	$ 266,716	$ 517,850
						FY22 Program Total		$ 2,188,333

FY22 Meter Purchase Growth Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate
Units Required	5,600	550	292	131	100	7,000	19%	31%
Unit Cost	$ 120.20	$ 131.59	$ 492.40	$ 1,321.20	$ 1,910.17	$ 56.24		
Total Cost	$ 673,120	$ 72,374	$ 143,781	$ 173,078	$ 191,017	$ 393,708	$ 312,945	$ 607,607
						FY22 Program Total		$ 2,567,631

FY22 Meter Purchase Growth Estimate

	250 Class Meters	400 Class Meters	LG Diaphragm Me	Rotary Meters	Correctors	ERTs	Labor Rate	Capital OH Rate
Units Required	5,600	550	292	131	100	7,000	19%	31%
Unit Cost	$ 122.60	$ 134.22	$ 502.25	$ 1,347.63	$ 1,948.38	$ 57.37		
Total Cost	$ 686,582	$ 73,822	$ 146,657	$ 176,539	$ 194,838	$ 401,582	$ 319,204	$ 619,759
						FY22 Program Total		$ 2,618,984

Exhibit 9

Historic Spend	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Customer connections – Meter Purchases	$ 1,424,842	$ 1,751,847	$ -	$ -	$ -
Purchase Meters (Replacements)	$ 3,663,880	$ 4,504,749	$ 6,609,298	$ 4,964,476	$ 6,856,868
Install Elevated Pressure Correctors	$ -	$ -	$ -	$ 590,466	$ 1,015,546
Meter Testing Equipment	$ -	$ -	$ 255,085	$ 106,561	$ 611,953

Units	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Customer connections – Meter Purchases	3,122	4,708	-	-	-
Purchase Meters (Replacements)	8,028	12,107	22,143	24,751	19,024
Install Elevated Pressure Correctors	-	-	-	207	205

Unit Cost	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Customer connections – Meter Purchases	$ 456	$ 372	$ -	$ -	$ -
Purchase Meters (Replacements)	$ 456	$ 372	$ 298	$ 201	$ 360
Install Elevated Pressure Correctors	$ -	$ -	$ -	$ 2,852	$ 4,954

Note: Customer Connections and Purchase Meter units and costs all included in Purchase Meter line item for FY18-FY20

Exhibit 10 Transmission Services

Dollars $000s						
	Actual	Budget	Abandonments	Main Ext	Svc Install	# jobs
FY20	2,037	3,127	-	72	72	72
FY19	995	3,294	48	48	48	48
FY18	1,158	420	-	-	-	-
Total	4,190	6,841	48	120	120	120

Exhibit 11 Pipeline Integrity

	FY16	FY17	FY18	FY19	FY20
IVP Total	-	97	2,483	5,313	15,382
IMP Total	13,688	8,160	8,332	8,057	10,140
Washout Total	3,363	1,422	293	2,445	6,221
Reactive Total	-	699	858	4,191	1,089

Exhibit 12 Proactive Low Pressure System Replacement

	mains (mi.)	$M	$M/mi.	$/ft (MRP)	$M, based on proactive MRP unit costs
FY22	3	4	1	237	4
FY23	3	4	1	242	4
FY24	4	4	1	256	6

Proactive Low Pressure System Replacement	LP System	Mains (mi.)
FY22	Watertown 9 WI	2
	Hudson	2
FY23	Little Falls	1
	Hudson	2
FY24	Lysander	3
	Hudson	2

Exhibit 1
Reinforcement and Reliability Program

FY	Town	Description	Unit Cost	Estimated Cost	Project Type	Length1	Length2	Length3	MAOP	Main Connections	Service Counts	Cast Iron Footage	Affected Customers (Design Day)
2021	Watervliet	Make a LP connection at the intersection of 5th Ave and 19th St using 45 ft of 6" main	$237	$21,294	New Main	45			LP	2	0	0	116
2021	Albany	Install 400 ft of 6" of 24 psig main on Robin St between Washington Ave and State St	$237	$94,640	New Main	400			24	2	0	0	68
2021	Schenectady	Install 1,300 ft of 4" 32 psig main on Bradley Blvd between Mc Clellan St and N Elm St and make tie-ins at Furman St and Division St. Transfer all trhe LP customers on new MP and retire the LP main.	$246	$319,241	Load Shed	1300			32	4	24	148	242
2021	Albany	Install 3,200 ft of 4" 24 psig main on Hendrick Ave, Amsterdam Ave, Peal St and Wolfert St. Install 500 ft of 2" 24 psig on Highland St, 750 ft of 2" 24# main om Hampton St and 880 ft of 2" 24 psig main on Pawling St. Transfer LP customers on the new MP main. Retire the LP main.	$246	$1,308,888	Load Shed	3200	2130		24	3	100	1844	249
2021	Albany	Install 850 ft of 6" 24 psig main on California Ave and Central Ave,	$246	$1,058,407	Load Shed	850	1730	1730	24	4	80	2797	312
2021	Albany	Install 200 ft of 8" 45 psig of main on Magazine St from Maplewood Ave and Western Ave. Install 1,450 ft of 2" 45 psig main on Tudor Rd. Transfer all LP customers to MP. Retire the LP main.	$246	$405,191	Load Shed	200	1450		45	1	30	307	18
2021	Albany	Install 1,450 ft of 4" main on Cortland Ave, W Lawrence Ave and Bancker St between Allen St and S main Ave	$246	$356,077	Load Shed	1450			24	2	40	921	254
2021	Rotterdam	Install 200 ft of 6" LP main to loop existing 2" LP main on Butler Ln west of Hamburg St	$237	$47,320	New Main	200			LP	2	0		24
2021	Altamont	Install 13640 ft of 8in main on State Rt 146 and Western Ave and connect to the 45 main south of Interconnect valve #6177. OR Uprate existing 32# main on State Rt 146 and Western Ave till interconnect valve to 45#. Move the Valve to north of Hartmans Corner.	Project Graded	$500,000	New Main				45	2	0	0	767
2021	Rexford	Install 9500 ft of 124# 12" ST main on Rt 146. Install a new Regulator station 124# to 45#. Install 4420 ft of 16" 45# main on Rt 146 from the new Reg to Ballston Lake Rd	Project Graded	$2,300,000					45	2	0	0	
2021	Schenectady	PL E-36 Uprate	Project Graded	$1,560,722	Uprate								-
2021	Watertown	Make a tie-in on Bronson St just east of High St using 12" main	$1,422	$71,100	New Main	50			22	2	0	0	1978
2021	Skaneateles	Install 900 ft of 6" 15 psig main on Jewett Rd east of Route 321 Rd to connect the existing mains	$237	$212,940	New Main	900			15	2	0	0	356
2021	Bridgeport	Install 380 ft of 4" 24 psig main on Shackelton Point Rd east of Pierce Rd till Shore Lawn Dr. Install 580 ft of 4" 24 psig main on Shackelton Point Rd from east of Shore Lawn Dr and connect the existing mains	$237	$227,136	New Main	960			24	4	0	0	57
		Carry Over Projects		$1,717,045									-
				$10,200,000									
2022	Altamont	Install 13640 ft of 8in main on State Rt 146 and Western Ave and connect to the 45 main south of Interconnect valve #6177. OR Uprate existing 32# main on State Rt 146 and Western Ave till interconnect valve to 45#. Move the Valve to north of Hartmans Corner.	Project Graded	$6,000,000	New Main	13,640			45	2	0	0	
2022	Hanagan	Install 300 ft of 4" 28 psig main on Northern Blvd from Pawling St and Church St	$245	$73,500	New Main	300			28	2	0	0	
2022	Cohoes	Install 680 ft of 4" 24 psig main on James St from Krug St and Jefferson Ave. Pressure test 578 ft of plastic main on Montgomery St and Jefferson St. Install 360 ft of 2" 24 psig main on Jefferson Ave (East of James St). Transfer approximately 20 LP customers on MP. Only Retire LP main on Jefferson Ave.	$268	$433,090	Load Shed	680	360	578	24	1	20	0	
2022	Albany	Install 240 ft of 4" main on Ryckman Ave and 160 ft of 2" main on Mercer St. Retire the LP main on Ryckman Ave. Transfer approx. 6 LP customers on MP. (CI footage: 342 ft)	$268	$107,068	Load Shed	240	160		24	3	6	342	
2022	Albany	Install 500 ft of 8" LP main on New Scotland Rd and Normanside Dr and connect to the existing mains	$245	$122,500	New Main	500			LP	2		0	
2022	Pennelville	Install 8,700 ft of 12" 24 psig on County Hwy 12 and connect the existing 8" mains on County Hwy 12 and Oneida River Rd	Project Graded	$2,700,000	New Main	8700			24	2	0	0	
				$9,436,158									
2023	Amsterdam	Make a tie-in on Brookside Ave just north of Elias St using a 4" 28 psig main	$253	$25,300	New Main	50			28	2	0	0	
2023	Wilton	Install 4,200 ft of 6" 45 psig main on Ballard Rd from North Rd to existing main on Ballard Rd	$253	$1,062,600	New Main	4200			45	2	0	0	
2023	Rotterdam	Install 2,600 ft of 8" of 32 psig main on Lilac St, Evergreen St, Tulip St and Guilderland Ave. Install 350 ft of 2" main on Tulip St between Lawn Ave and Evergreen St. Install 580 ft of 2" of 2" main on Evergreen Ave between Tulip St and Pansy St. Install 600 ft of 4" main on Pansy St between Lawn Ave and Arbor Ave. Install 580 ft of 4" main on Arbor Ave from Tulip St and Pansy St. Transfer approximately 55 LP customers to MP. Retire the LP main on Evergreen Ave, Pansy St, Tulip St (between Lawn Ave and Evergreen St) and Arbor Ave (between Tulip St and Pansy St).	$276	$1,298,547	Load Shed/ New Main	2600	1180	930	32	4	55	0	
2023	Rexford	Rt 146	Project Graded	$70,000									

Exhibit 1
Reinforcement and Reliability Program

FY	Town	Description	Unit Cost	Estimated Cost	Project Type	Length1	Length2	Length3	MAOP	Main Connections	Service Counts	Cast Iron Footage	Affected Customers (Design Day)
2023	Schenectady	Install 3,000 ft of 8" 32 psig main on Barrett St, Liberty St, Notter Ave and Eastern Ave. Retire the LP main on Barrett St and transfer about 10 LP customers to MP.	$253	$806,520	Load Shed/ New Main	3000			32	2	10	217	
2023	Black River	Install 5,000 ft of 8" 60 psig main on State Route 342 from existing main on NY State Route 3 to 4" main on Howe St (with a future possibility of extending the main to Leray St).	Project Graded	$2,250,000	New Main	5000			60	2	0	0	
2023	Central Square	Install 700 ft of 4" 24 psig main on Summerhill Dr from existing main on south of State Hwy 49 to Green Acres Dr	$253	$177,100	New Main	700			24	2	0	0	
		LP		$3,000,000									
				$8,690,067									
2024	Schuykerville	Install 250 ft of 2" 19 psig main on Clancy St from County Hwy 336 to the existing main on Clancy St	$262	$65,500	New Main	250			24	2	0	0	
2024	Albany	Install 260 ft of 8" 24 psig main on Central Ave just south of Reber St and connect the existing main on Central Ave	$262	$68,120	New Main	260			24	2	0	0	
2024	Rensselaer	Install 3,100 ft of 6" 24 psig main on Bloominggrove Dr, Green Hill Rd and Snyders Lake Rd from the existing 6" main north of Teliska Ave. Make intermediate tie-ins at Sitzmark Ln and Lape Rd.	$262	$812,200	New Main	3100			24	3	0	0	
2024	Albany	Make a tie-in using a 4" 24 psig at the intersection of Hansen Ave and Ryckman Ave	$262	$26,200	New Main	50			24	2	0	0	
2024	Albany	Make a tie-in using a 2" 24 psig at the intersection of Partridge St and Central Ave	$262	$26,200	New Main	50			24	2	0	0	
2024	Albany	Install 650 ft of 2" 24 psig main on Colonie Plaza Dr (Near Price Chopper Super Center)	$262	$170,300	New Main	650			24	2	0	0	
2024	Various	MP Projects TBD (Central)		$1,000,000									
2024	Various	**LP**		$3,000,000									
				$5,168,520									
2025	Various	MP Projects TBD (Central)		$1,000,000									
2025	Rotterdam	Install 4,500 of 8" main on Hamburg St from Abbottsford Rd and make tie-ins at Cladicott Rd, Chepstow Rd, Carleon Rd and Cardiff Rd. Install 1,300 ft of 6" main on Christler Ave and Tower Rd from Hamburg St.	$271	$1,571,800	New Main	4500	1300		32	6	0	0	
		LP		$3,000,000									
				$5,571,800		67525	12730	3238				6576	
						83493							

FY	Town	Project	Unit Cost	New Estimate	# of Customers Affected
2021	Colonie	Install a RCV and Flow Control Valve at Wolf Gate Station (Construction))	Project Graded	$3,347,328	
2021	Albany	Upgrade LP main to MP to retire Regulator Station at Maple		$200,000	
		Install RCV at valve V-5201 Velasko Rd & Onondaga Blvd	Project Graded	$419,000	
2021	Rotterdam	Install 3000' of 12" plastic on Duanesburg Rd from Keller Ave to Rotterdam St. (a portion of this main will either need to be strung on the bridge, or drilled under 4 train tracks)	Project Graded	$3,420,705	17571
		Engineering		$ -	
				$ 7,387,033	
2022	Rensselaer	924-302B Ferry St and 924-346 2nd Ave - 9,132 ft of main (Steel: 3,175 ft, Plastic: 3,407 ft, CI and BS: 2,550) and 188 customers	$268	$1,222,181	Isolated LPP
2022	Amsterdam	924-812 Edson St - 9,222 ft of main (Steel: 3,654 ft, Plastic: 2,722 ft, CI and BS: 2,846) and 178 customers	$268	$1,234,226	Isolated LPP
2022	Rotterdam	Burdeck Gate Station or Valve #401-71	Cost Book	$ 113,214	RCV
		Engineering			
				$ 2,569,621	
2023	Rensselaer	924-302B Ferry St and 924-346 2nd Ave - 9,132 ft of main (Steel: 3,175 ft, Plastic: 3,407 ft, CI and BS: 2,550) and 188 customers	$276	$1,258,846	Isolated LPP
2023	Amserdam	924-812 Edson St - 9,222 ft of main (Steel: 3,654 ft, Plastic: 2,722 ft, CI and BS: 2,846) and 178 customers	$276	$1,271,253	Isolated LPP
2023	Glenmont	Install 3800 ft of 12" main from existing main on Kenwood Ave to outlet of GRS 924-348	Project Graded	$1,900,000	Loss of GRS 340 (15575 Customers)
		Engineering			
				$ 4,430,099	
2024	Troy	924-539 Brookview Avenue - 10,551 ft of main (Steel:4,427 ft, Plastic: 2,213 ft, CI and BS: 3,911) and 173 customers	$284	$1,498,084	
2024	Albany	924-349 Lodge St - 10,037 ft of main (Steel:693 ft, Plastic: 2,073 ft, CI and BS: 7,271) and 59 customers	$284	$1,425,103	Isolated LPP
2024	Oneida	Install one valve at Oneida Regulator Station feed to Rome	Cost Book	$2,184,451	RCV
		Engineering			

Exhibit 1
Reinforcement and Reliability Program

FY	Town	Description	Unit Cost	Estimated Cost	Project Type	Length1	Length2	Length3	MAOP	Main Connections	Service Counts	Cast Iron Footage	Affected Customers (Design Day)
				$ 5,107,639									
2025	Troy	924-539 Brookview Avenue - 10,551 ft of main (Steel:4,427 ft, Plastic: 2,213 ft, CI and BS: 3,911) and 173 customers	$292	$1,543,031									
2025	Albany	924-349 Lodge St - 10,037 ft of main (Steel:693 ft, Plastic: 2,073 ft, CI and BS: 7,271) and 59 customers	$292	$1,467,861	Isolated LPP								
2025	Phoenix	At Biddlecum Gate Station	Cost Book	$2,228,140	RCV								
		Engineering											
				$ 5,239,032									

Niagara Mohawk Power Corporation
d/b/a National Grid
Case 20-E-0380 20-G-0381

GAS PROJECT COST ESTIMATE

Estimate Level	Level I				
Project Name:	**UNY 12" RELIEF VALVE VAULT**			**Enter Labor Split %**	
Project Funding Number:(7 char)		**GPE ID:**		**CAPEX**	100%
Work Order #:(11 char)				**OPEX**	0%
Region:	Upstate_NY	**Bid Area:**	Upstate	**Removal**	0%
City:	SYRACUSE	**Overhead Area:**	Upstate	**Total**	100%
State:	NY	**Date:**(mm/dd/yyyy)			
		Estimated By:	COPPOLA		
Project Type:	Special Project	**Project FY**	FY1819		
	Length	**Size**	**Material**		
New Main:				**Number of Services Involved:**	
Abandon Main:					

Scope of Work: 12"Relief Valve installed in a Vault in UNY in Hard Surface.

		Direct Costs	Escalator	Contingency	Total Direct Costs
	NG Labor (Mgmt)	$ 1,901.60	$ -	$ 190.16	$ 2,091.76
	In-House Labor (Union)	$ 6,781.60	$ -	$ 678.16	$ 7,459.76
	Total National Grid Labor	**$ 8,683.20**	**$ -**	**$ 868.32**	**$ 9,551.52**
5.00%	NG Transportation-Vehicles	$ 434.16	$ -	$ 43.42	$ 477.58
	Stock Materials	$ 3,902.96	$ -	$ 390.30	$ 4,293.26
	Non-Stock Materials	$ 34,710.61	$ -	$ 3,471.06	$ 38,181.67
	Total Materials	**$ 38,613.57**	**$ -**	**$ 3,861.36**	**$ 42,474.93**
	Construction Contractor	$ 55,714.24	$ -	$ 5,571.42	$ 61,285.66
	Restoration Contractor (In-House Construction Applicable)	$ -	$ -	$ -	$ -
	Police	$ -	$ -	$ -	$ -
	Permits	$ -	$ -	$ -	$ -
	Other (NO COH APPLIED)	$ -	$ -	$ -	$ -
	Total Direct Cost	**$ 103,445.17**	**$ -**	**$ 10,344.52**	**$ 113,789.69**

		Overheads	Escalator	Contingency	Total Overheads
76.30%	Payroll Labor OH - NG Mgmt	$ 1,450.92	$ -	$ 145.09	$ 1,596.01
67.30%	Payroll Labor OH - NG Union	$ 4,564.02	$ -	$ 456.40	$ 5,020.42
23.00%	Material Handling OH - Stock	$ 897.68	$ -	$ 89.77	$ 987.45
37.00%	**Capital Overheads (COH)**				
Applied to	NG Grid Labor (Mgmt)	$ 703.59	$ -	$ 70.36	$ 773.95
	In-House Labor (Union)	$ 2,509.19	$ -	$ 250.92	$ 2,760.11
	NG Transportation-Vehicles	$ 160.64	$ -	$ 16.06	$ 176.70
	Stock Materials	$ 1,444.10	$ -	$ 144.41	$ 1,588.50
	Non-Stock Materials	$ 12,842.93	$ -	$ 1,284.29	$ 14,127.22
	Construction Contractor	$ 20,614.27	$ -	$ 2,061.43	$ 22,675.70
	Restoration Contractor (In-House Construction Applicable)	$ -	$ -	$ -	$ -
	Police	$ -	$ -	$ -	$ -
	Permits	$ -	$ -	$ -	$ -
	Payroll Labor OH - NG Mgmt	$ 536.84	$ -	$ 53.68	$ 590.52
	Payroll Labor OH - NG Union	$ 1,688.69	$ -	$ 168.87	$ 1,857.55
	Material Handling OH - Stock	$ 332.14	$ -	$ 33.21	$ 365.36
	Total Overhead Cost	**$ 47,745.00**	**$ -**	**$ 4,774.50**	**$ 52,519.50**
				AFUDC	**$ 1,411.96**
				Subtotal Direct & Overheads	**$ 166,309.19**

		ACTUALS to date	**$**
Total Project Estimate			**$ 167,721.15**
Overall Footage:		**Cost/Foot**	**$ -**
Est. Construction Duration:			
Contingency (%)	10%		
Equivalent Overall OH (%)	47%		

Additional Work Order Numbers:

Comments / Assumptions:

Ver. 17.3 - 11 07 2017

Odor Vapor Management					
Item	Material Cost	Miscelaneous Materials	Labor Cost	Conctractor Costs	Totals
Vacuum filt	$3,837.75	$500.00	$2,500.00	$0.00	$6,837.75
Floor Sealir	$1,500.00	$0.00	$0.00	$2,100.00	$3,600.00
Mercaptan	$4,685.00	$500.00	$500.00	$0.00	$5,685.00
SCADA Equ	$3,000.00	$2,000.00	$3,000.00	$0.00	$8,000.00
Total					$24,122.75

Exhibit 1

Gas Regulator Station Security Project

$M	FY 2022	FY 2023	FY 2024
Annual testing and inspection (8hrs/yr	0.024	0.03	0.037
Repairs & Maintenance (6 hrs / site / y	0.018	0.024	0.03
Operating Expenses (Communications	0.024	0.03	0.035
Total OPEX	**0.066**	**0.084**	**0.102**

Exhibit 2

Upstate FTE request

	Quantity	Unit	Hours	Days
CIS	1	Mile	8	1
ACVG	1	Mile	8	1
Direct Assessment	1	Dig	24	3
		Total	**40**	**5**

		FY22/23	FY23/24	FY24/25	FY25/26
75	miles/yr	750	750	750	750
			Total	**3**	**FTE**

Voluntary IMP Program	**NOTE - (2) Techs needed to complete**		**Total**	**80**	**10**

* Original IMP projection

		Quantity	Unit	Hours	Days
PHMSA Plastic Rule	Monitoring	15	Test Stations	8	1
	Remediation Re-checks	5	Jobs	8	1
	Data input/Scheduling	25	Locations	8	1

* Survey Program Growth 2,000

Initial		FY22/23	FY23/24	FY24/25	FY25/26
2000	Inspections	133	133	133	133
100	Remediation re-checks	20	20	20	20
2000	Data input/Scheduling	80	80	80	80
	Total	**233**	**233**	**233**	**233**

Total **1** **FTE**

Exhibit 3 **Enhanced Contractor Safety Inspections Program**

Attachment A – Support DPS990 question column AE – A detailed description of how the company determined the need and timing for the FTE

Exhibit 4

Fiscal Year 2016	
Year/Month	Actual Spend
15-Apr	-$122
15-May	$691
15-Jun	$501
15-Jul	$20,790
15-Aug	$7,476
15-Sep	$56,051
15-Oct	$14,013
15-Nov	$18,547
15-Dec	$64,626
16-Jan	$53,056
16-Feb	$81,584
16-Mar	$53,245
Total	$370,460

Fiscal Year 2017	
Year/Month	Actual Spend
16-Apr	$15,949
16-May	$5,757
16-Jun	$28,089
16-Jul	$3,501
16-Aug	$2,172
16-Sep	$46,742
16-Oct	$52,235
16-Nov	$1,487
16-Dec	$487
17-Jan	$1,200
17-Feb	$18,722
17-Mar	$94,927
Total	$271,269

Fiscal Year 2018	
Year/Month	Actual Spend
17-Apr	$25,093
17-May	$68,093
17-Jun	$14,623
17-Jul	$16,227
17-Aug	$30,147
17-Sep	-$10,443
17-Oct	$43,204
17-Nov	-$101,732
17-Dec	$178,745
18-Jan	$65,977
18-Feb	-$198,495
18-Mar	$110,335
Total	$241,775

Fiscal Year 2019	
Year/Month	Actual Spend
18-Apr	-$3,057
18-May	$16,181
18-Jun	$5,175
18-Jul	$85,657
18-Aug	$15,111
18-Sep	$3,167
18-Oct	$16,372
18-Nov	$36,228
18-Dec	$4,163
19-Jan	$17,436
19-Feb	$8,743
19-Mar	$48,707
Total	$253,883

Fiscal Year 2020	
Year/Month	Actual Spend
19-Apr	$2,433
19-May	$10,578
19-Jun	$1,475
19-Jul	-$561
19-Aug	$16,918
19-Sep	$3,457
19-Oct	$55,516
19-Nov	$22,688
19-Dec	$2,091
20-Jan	$45,422
20-Feb	$13,029
20-Mar	$15,032
Total	$188,077

Fiscal Year 2021	
Year/Month	Actual Spend
20-Apr	$14,136
20-May	$10,099
20-Jun	$99,780
20-Jul	$3,174
20-Aug	$2,942
20-Sep	$48,571
20-Oct	$83,121
20-Nov	$0
20-Dec	$0
21-Jan	$0
21-Feb	$0
21-Mar	$0
Total	$261,823

nationalgrid	ESTIMATING DOCUMENT	Page 1 of 3
	Estimate Overview	Version 06.1 – 03/14/2019
	C081284-East Canada Creek HDD Dolgeville-4.4	

PURPOSE

This form documents the assumptions and any other items that went into creating the estimate. To ensure consistency in all the published estimates, the items that influenced the final estimate are listed here and then included in the published Estimate PDF file.

1.0 ESTIMATE DESCRIPTION

1.1	Project Funding # :	C081284
1.2	Project Work Order #:	10028406579
1.3	Estimate Name:	C081284-East Canada Creek HDD Dolgeville-4.4
1.4	Estimate Completion Date:	08/19/2020
1.5	Estimate Stage:	4.4

2.0 SCOPE OF WORK

Perform a 688' HDD under East Canada Creek and install a 4" steel distribution main. Transition to 4" plastic distribution main from the entry pit to the tie-in locations. Open trench from the entry/exit pits to the tie-in locations. Street opening will occur on 2nd Street on both sides of the creek.

3.0 CLARIFICATIONS

3.1 The estimate is based on drawing D-70374-C dated 05/16/2019.

3.2 AFUDC was calculated using a combined debt/equity rate of 6.10% which is based on the past 2 years average actual rate and an in-service date of 09/30/2020.

3.3 The estimate includes $206,473 spend to date as of 08/03/2020.

3.4 The project scope meets the NYS PSC Complex Project definition and will be a candidate for the NYS UNY Gas Estimating Performance Metric.

3.5 Civil, mechanical and restoration work will be completed by John Anderson Construction Inc. Their total final award was $792,610. ($774,610 (Original bid) + $18,000 (Change Order)

3.6 There is a change order of $18,000 included in this estimate from Seth Herman's email to extend the drill 50' dated August 14th,2020.

3.7 Ten (10) percent of all welds will be testing using Non-Destructive Examination (NDE).

3.8 National Grid's overhead and burden rates used in this estimate were based on the May 2020 Sage Templates.

3.9 Material pricing is based on actual PO Costs and National Grid inventory items.

3.10 320 ft of the 4" Powercrete Pipe was transferred from excess material at a zero cost.

4.0 ASSUMPTIONS

4.1 The field construction activities are scheduled for 45 days in duration.
4.2 John Anderson Construction Inc. will be working 12-hour days/11 days on/3 days off.
4.3 Construction will be complete by October 15th, 2020.
4.4 One Full-Time National Grid FCC will be On-Site during construction activities.
4.5 A second National Grid FCC will be On-Site for 10 days during HDD activities.
4.6 Kleinfelder Supervision will be On-Site for all drilling activities and for vibration monitoring.
4.7 One 4" Steel HDD for 688 ft.
4.8 Two (2) 4" Tie-Ins with using 4" side-out fittings will be performed by National Grid in-house welders.

5.0 EXCLUSIONS

5.1 Additional costs for unanticipated work hour restrictions.
5.2 No additional cost during Winter is included which leads to less productivity.
5.3 Removal and disposal of hazardous spoils.
5.4 Dewatering.
5.5 SWPPP.
5.6 Major downtime due to weather.
5.7 Drilling through rock.
5.8 On-site safety person as the award was under $1 Million.

6.0 RISK / CONTINGENCY

The risk-based contingency figures (P50/P80) presented in this estimate are intended to cover risks associated with the presented scope. Scope changes are not included.

6.1 The estimate includes a contingency of 5%.

6.2 A risk meeting was held on 07/28/2020.
- 6.2.1 Risk Dollars P50 / EV - $57,441
- 6.2.2 Risk Dollars P80 / SC - $116,244

7.0 ESCALATION

N/A

nationalgrid	ESTIMATING DOCUMENT	Page 3 of 3
	Estimate Overview	Version 06.1 – 03/14/2019
	C081284-East Canada Creek HDD Dolgeville-4.4	

8.0 ESTIMATE HISTORY

8.1 Stage 4.3 Estimate
- 8.1.1 Date:07/29/2019
- 8.1.2 Base Total: $1,251,975
- 8.1.3 P50 Total: $1,455,486
- 8.1.4 P80 Total: $1,708,648

8.2 Stage 4.4 Estimate
- 8.2.1 Date: 08/19/2020
- 8.2.2 Base Total: $1,472,175
- 8.2.3 P50 Total: $1,529,616
- 8.2.4 P80 Total: $1,588,419

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Estimate Totals

C081284-East Canada Creek HDD Dolgeville-4.4

Utility	**Gas**	Proj Number	**201808208929**	Est Number	
Proj Type	**Gas Distribution**	Funding Proj	**C081284**	Est Stage	**4.4**
Proj Lead	**McGraw, Matt**	Work Order	**10028406579**	Est Version	**1**
Estimator	**Coppola, Brian**	State	**NY**	Est Type	**Complex**
Company	**5210 - Niagara Mohawk Power Corp**	Fiscal Yr	**2021**	Last Update	**8/15/2020 12:53:05 PM**
Base Template	**Gas - 5210 - NY - NIMO Gas - Apr 2020**				

	CAP	OPE	COR	Total
Base Total	**1,392,071**	**-**	**10,000**	**1,402,071**
Base + Contingency Total	**1,461,674**	**-**	**10,500**	**1,472,174**
Base + Contingency + P50 Total				**1,529,615**
Base + Contingency + P80 Total				**1,588,418**

Prepared by: 08/19/202

Reviewed by:

Reviewed by:

Reviewed by: 08/19/2020

Approved by: Paul A. Coppola 08/20/202

This estimate is valid until: 02/19/202

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Estimate Summary

C081284-East Canada Creek HDD Dolgeville-4.4

Utility	**Gas**	Proj Number	**201808208929**	Est Number	
Proj Type	**Gas Distribution**	Funding Proj	**C081284**	Est Stage	**4.4**
Proj Lead	**McGraw, Matt**	Work Order	**10028406579**	Est Version	**1**
Estimator	**Coppola, Brian**	State	**NY**	Est Type	**Complex**
Company	**5210 - Niagara Mohawk Power Corp**	Fiscal Yr	**2021**	Last Update	**8/15/2020 12:53:05 PM**
Base Template	**Gas - 5210 - NY - NIMO Gas - Apr 2020**				

		CAP	OPE	COR	Total
Labor - Management		51,263	-	-	51,263
Labor - Craft		15,407	-	-	15,407
Material - Stock		2,971	-	-	2,971
Material - Non-stock		14,397	-	-	14,397
Subcontractor		875,578	-	10,000	885,578
Equipment		9,996	-	-	9,996
Other		79,790	-	-	79,790
Subtotal (by Category)		**1,049,403**	**-**	**10,000**	**1,059,403**
Material Tax	7.88%	1,369	-	-	1,369
Stores Material Handling	18.00%	577	-	-	577
Overhead - Management	71.40%	36,602	-	-	36,602
Overhead - Craft	61.95%	9,545	-	-	9,545
COD	25.00%	254,416	-	-	254,416
A&G	2.48%	25,238	-	-	25,238
AFUDC	-	14,922	-	-	14,922
Escalation	-	-	-	-	-
Base Total		**1,392,071**	**-**	**10,000**	**1,402,071**
Contingency	5.00%	69,604	-	500	70,104
Base + Contingency Total		**1,461,674**	**-**	**10,500**	**1,472,174**
P50					57,441
Base + Contingency + P50 Total					**1,529,615**
P80					116,244
Base + Contingency + P80 Total					**1,588,418**

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Summary by Division

C081284-East Canada Creek HDD Dolgeville-4.4

Utility	**Gas**	Proj Number	**201808208929**	Est Number	
Proj Type	**Gas Distribution**	Funding Proj	**C081284**	Est Stage	**4.4**
Proj Lead	**McGraw, Matt**	Work Order	**10028406579**	Est Version	**1**
Estimator	**Coppola, Brian**	State	**NY**	Est Type	**Complex**
Company	**5210 - Niagara Mohawk Power Corp**	Fiscal Yr	**2021**	Last Update	**8/15/2020 12:53:05 PM**
Base Template	**Gas - 5210 - NY - NIMO Gas - Apr 2020**				

	Lab Hrs	Labor	Material	Sub	Equip	Other	Total
01 - General Requirements	1,347	66,671	-	92,153	9,996	79,790	248,610
31 - Earthwork	-	-	-	815	-	-	815
40 - John Anderson Award	-	-	14,397	792,610	-	-	807,007
51 -	-	-	119	-	-	-	119
52 -	-	-	511	-	-	-	511
90 -	-	-	2,341	-	-	-	2,341
Subtotal Cost (by Division)	**1,347**	**66,671**	**17,368**	**885,578**	**9,996**	**79,790**	**1,059,403**

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Estimate Detail

C081284-East Canada Creek HDD Dolgeville-4.4

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	*** Unassigned**		**1,347**	**66,671**	**17,368**	**885,578**	**9,996**	**79,790**	**1,059,403**
	*** Unassigned**		**1,347**	**66,671**	**17,368**	**885,578**	**9,996**	**79,790**	**1,059,403**
	Stantec (Actual)	1 ls	-	-	-	47	-	-	47
	Engineering & Design Fees TRC (Actual)	1 ls	-	-	-	38,710	-	-	38,710
	Parratt Wolff Compression Testing (Actual)	1 ls	-	-	-	1,800	-	-	1,800
	Supervisor - Contractor Sky Testing (Actual)	1 ls	-	-	-	1,501	-	-	1,501
	X-Ray	3 dy	-	-	-	5,415	-	-	5,415
	Environmental Dumpsters	1 ls	-	-	-	5,200	-	-	5,200
	Home Office Travel & Expenses	1 ls	-	-	-	-	-	1,000	1,000
	Home Office Travel & Expenses (Actual)	1 ls	-	-	-	-	-	1,187	1,187
	NGrid Lead Engineer	32 mh	32	1,732	-	-	-	-	1,732
	NGrid Lead Engineer (Actual)	52 mh	52	2,830	-	-	-	-	2,830
	NGrid Lead Scientist / Environmetal Engineer (Actual)	41 mh	41	2,091	-	-	-	-	2,091
	NGrid Estimator	18 mh	18	838	-	-	-	-	838
	NGrid Estimator (Actual)	25 mh	25	1,164	-	-	-	-	1,164
	NGrid Designer (Actual)	55 mh	55	2,443	-	-	-	-	2,443
	Maps and Records	120 mh	120	5,380	-	-	-	-	5,380
	NGrid Lead Project Manager	60 mh	60	3,505	-	-	-	-	3,505
	NGrid Lead Project Manager (Actual)	48 mh	48	2,804	-	-	-	-	2,804
	NGrid Lead Project Development (Actual)	21 mh	21	1,227	-	-	-	-	1,227
	NGrid Lead Supv Operations / Lead Supervisor	120 mh	120	6,406	-	-	1,440	-	7,846
	NGrid Lead Community Outreach	8 mh	8	427	-	-	96	-	523
	NGrid Lead Community Outreach (Actual)	21 mh	21	1,121	-	-	252	-	1,373
	NGrid Supv Operations	540 mh	540	24,581	-	-	6,480	-	31,061
	NGrid Senior Gas Sys Operator	1 mh	1	49	-	-	-	-	49
	NGrid Real Estate Representative Union (Actual)	10 mh	10	438	-	-	-	-	438
	NGrid Senior Counsel (Actual)	4 mh	4	396	-	-	-	-	396
	NGrid Senior Quality Inspector	32 mh	32	1,444	-	-	384	-	1,828
	NGrid 3 Man I&R Crew	96 mh	96	5,479	-	-	960	-	6,439
	Nelson Tree (Actual)	1 ls	-	-	-	815	-	-	815
	Easement Fredericksons (Actual)	1 ls	-	-	-	-	-	10,000	10,000
	Easement Petkovsek (Actual)	1 ls	-	-	-	-	-	2,000	2,000
	Work Order Transfer (Actual)	1 ls	-	-	-	-	-	56,616	56,616
	Print Room (Actual)	1 ls	-	-	-	-	-	988	988
	NGrid Lead Engineer (Actual)	12 mh	12	649	-	-	-	-	649

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Estimate Detail

C081284-East Canada Creek HDD Dolgeville-4.4

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount (S)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Temporary Access Works	1 LS	-	-	-	59,850	-	-	59,850
	Site Set-up	1 LS	-	-	-	86,000	-	-	86,000
	Deomolition/Decommissing/Removal	1 LS	-	-	-	10,000	-	-	10,000
	Buried Pipe Installation	1 LS	-	-	-	507,260	-	-	507,260
	Paving & Restoration	1 LS	-	-	-	30,000	-	-	30,000
	Final Commissioning	1 LS	-	-	-	10,000	-	-	10,000
	Performance Bond	1 LS	-	-	-	16,500	-	-	16,500
	Contractor Project Managment	1 LS	-	-	-	30,000	-	-	30,000
	Gas-In-Tie-In	1 LS	-	-	-	25,000	-	-	25,000
	Intertek Moody PO	1 ls	-	-	-	1,620	-	-	1,620
	4.5 x .237 X52 DRLS w/ FBE & Powercrete	539 lf	-	-	14,397	-	-	-	14,397
	FITTING, LINE STOPPER 4IN IPS SIDE OUT (SAP # 9314455)	2 ea	-	-	1,360	-	-	-	1,360
	TRACER WIRE, DIRECT BURY USE, COPPER, 12AWG, 7 STRAND, HMW-HDPE 30 MIL INSULATING JACKET, YELLOW - 500 FT SPOOL (SAP # 9334433)	180 lf	-	-	22	-	-	-	22
	WIRE, GP 1C/NO.10AWG 600V CU SD STRD BLK	320 lf	-	-	58	-	-	-	58
	ANODE, MAG BAG 17LB 3.5INx25IN (SAP # 9311183)	8 ea	-	-	551	-	-	-	551
	PIPE, CS 4IN 237WL GR B BARE BEV NTP API (SAP # 9312326)	10 lf	-	-	109	-	-	-	109
	PIPE, HDPE 4IN IPS 500FT 409WL SDR11 (SAP # 9306310)	180 lf	-	-	486	-	-	-	486
	ELBOW, HDPE 4IN IPS 45DEG SDR11 BTFS (SAP # 9315948)	4 ea	-	-	25	-	-	-	25
	BOX, RDWY 6 IN IDx18 TOP 6-1/2INx30 BOT (SAP # 9315165)	2 ea	-	-	161	-	-	-	161
	CAP, CS 2IN BW WPB 154WL NTP B16.9 A234 (SAP # 9312095)	1 ea	-	-	10	-	-	-	10
	FITTING, TRNSN 4IN IPS STLx4IN IPS PLSTC (SAP # 9315793)	2 ea	-	-	181	-	-	-	181
	Kleinfelder HDD Supervision Quote	1 ls	-	-	-	28,560	-	-	28,560
	Per Diem for FCC's	40 dy	-	-	-	-	-	8,000	8,000
	CONNECTOR, COMP NO.8 STR WIRE CU	1 ls	-	-	9	-	-	-	9
	Kleinfelder HDD Supervision Vibration Monitoring Quote	1 ls	-	-	-	4,300	-	-	4,300
	NGrid Welder Crew	32 mh	32	1,668	-	-	384	-	2,052
	Drill Change Order	1 LS	-	-	-	18,000	-	-	18,000
	Kleinfelder Design Change Order	1 ls	-	-	-	5,000	-	-	5,000

	Total	**1,347**	**66,671**	**17,368**	**885,578**	**9,996**	**79,790**	**1,059,403**

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Material Analysis

C081284-East Canada Creek HDD Dolgeville-4.4

Material ID	Description	Quantity	Unit Price ($/Unit)	Amount ($)
9312326	PIPE, CS 4IN 237WL GR B BARE BEV NTP API (SAP # 9312326)	10 lf	10.92	109
9312095	CAP, CS 2IN BW WPB 154WL NTP B16.9 A234 (SAP # 9312095)	1 ea	10.01	10
E5144100200001300	4.5 x .237 X52 DRLS w/ FBE & Powercrete	539 lf	26.71	14,397
9306310	PIPE, HDPE 4IN IPS 500FT 409WL SDR11 (SAP # 9306310)	180 lf	2.70	486
9315948	ELBOW, HDPE 4IN IPS 45DEG SDR11 BTFS (SAP # 9315948)	4 ea	6.28	25
9311183	ANODE, MAG BAG 17LB 3.5INx25IN (SAP # 9311183)	8 ea	68.83	551
9315165	BOX, RDWY 6 IN IDx18 TOP 6-1/2INx30 BOT (SAP # 9315165)	2 ea	80.68	161
9314455	FITTING, LINE STOPPER 4IN IPS SIDE OUT (SAP # 9314455)	2 ea	679.87	1,360
9315793	FITTING, TRNSN 4IN IPS STLx4IN IPS PLSTC (SAP # 9315793)	2 ea	90.65	181
9334433	CONNECTOR, COMP NO.8 STR WIRE CU	1 ls	8.88	9
9334433	TRACER WIRE, DIRECT BURY USE, COPPER, 12AWG, 7 STRAND, HMW-HDPE 30 MIL INSULATING JACKET, YELLOW - 500 FT SPOOL (SAP # 9334433)	180 lf	0.12	22
9334433	WIRE, GP 1C/NO.10AWG 600V CU SD STRD BLK	320 lf	0.18	58
	Total			**17,368**

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Labor Analysis

C081284-East Canada Creek HDD Dolgeville-4.4

			CAP		OPE		COR		Total	
ID	Description	Rate Table	Hours	Amt ($)	Hours	Amt ($)	Hours	Amt ($)	Hours	Amt ($)
	Labor - Craft		**312**	**15,407**	**-**	**-**	**-**	**-**	**312**	**15,407**
81090670	Technician	L-GEN-70hr	96	5,479	-	-	-	-	**96**	**5,479**
81257223	Welder	L-GEN-60hr	32	1,668	-	-	-	-	**32**	**1,668**
82001499	Senior Designer	L-MGMT Gas UNY	175	7,823	-	-	-	-	**175**	**7,823**
82001647	Real Estate Representive	L-MGMT Gas UNY	10	438	-	-	-	-	**10**	**438**
	Labor - Management		**1,035**	**51,263**	**-**	**-**	**-**	**-**	**1,035**	**51,263**
80000745	Lead Project Manager	L-MGMT Gas UNY	129	7,536	-	-	-	-	**129**	**7,536**
82000353	Estimator	L-MGMT Gas UNY	43	2,001	-	-	-	-	**43**	**2,001**
82000373	Lead Supv Operations / Lead Supervisor	L-MGMT Gas UNY	149	7,954	-	-	-	-	**149**	**7,954**
82000393	Senior Counsel	L-MGMT Gas UNY	4	396	-	-	-	-	**4**	**396**
82001476	Lead Engineer	L-MGMT Gas UNY	96	5,212	-	-	-	-	**96**	**5,212**
82001826	Senior Gas Sys Operator	L-MGMT Gas UNY	1	49	-	-	-	-	**1**	**49**
82001946	Senior Quality Inspector	L-MGMT Gas UNY	32	1,444	-	-	-	-	**32**	**1,444**
82002201	Lead Scientist / Environmental Engineer	L-MGMT Gas UNY	41	2,091	-	-	-	-	**41**	**2,091**
82002760	Supv Operations	L-MGMT Gas UNY	540	24,581	-	-	-	-	**540**	**24,581**
	Total		**1,347**	**66,671**	**-**	**-**	**-**	**-**	1,347	66,671

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Equipment Analysis

C081284-East Canada Creek HDD Dolgeville-4.4

ID	Description	Hours	Unit Price ($/HR)	Amount ($)
gen-t-welding truck	gen-Welding Truck	32	12.00	384
t-pick up 4x4	Pick up 4X4	721	12.00	8,652
	Total	**753**		**9,036**

nationalgrid	ESTIMATING DOCUMENT	Page 1 of 4
	Estimate Overview	Version 06.1 – 03/14/2019
	C082363-RTE 146 Rexford-4.3	

PURPOSE

This form documents the assumptions and any other items that went into creating the estimate. To ensure consistency in all the published estimates, the items that influenced the final estimate are listed here and then included in the published Estimate PDF file.

1.0 ESTIMATE DESCRIPTION

1.1	Project Funding # :	C082363, C085152 (Land)
1.2	Project Work Order #:	10029154763, 90000200602, 90000209245 (Land)
1.3	Estimate Name:	C082363-RTE 146 Rexford-4.3
1.4	Estimate Completion Date:	08/18/2020
1.5	Estimate Stage:	4.3

2.0 SCOPE OF WORK

This project is needed to maintain above threshold minimum pressure on the 45 PSIG system. Without this project, 4,100 customers would experience pressures below the minimum threshold pressure when design day conditions (-10°F) occur.

The project consists of the following major components:

- Installation of a new 124 PSIG to 45 PSIG Gas Pressure Regulator Station.
- Installation of 240’ of 16” 45 PSIG steel gas main.
- Installation of 14,370’ of 12” 124 PSIG coated steel gas main.

3.0 CLARIFICATIONS

3.1 The estimate is based on the Gas Distribution Scoping Document dated 06/26/2020 and Drawing Numbers D-48737-E (Main) dated 06/30/2020 and D-48735-E (GRS) dated 09/09/2019.

3.2 AFUDC was calculated using a combined debt/equity rate of 6.10% which is based on the past 2 years average actual rate and an in-service date of 11/01/2021.

3.3 The estimate includes $657,110 spend to date as of 08/03/2020.

3.4 Civil, mechanical and restoration activities will be performed by a contractor awarded through a competitive bidding process.

3.5 A miscellaneous equipment allowance of $27,700 was included in this estimate.

3.6 This estimate includes a transfer of $108 from work order 9000020601 that will be cancelled.

3.7 The project scope meets the NYS PSC complex project definition and will be candidate for the NYS PSC UNY Gas Estimating Performance Metric.

3.8 Ten (10) percent of all welds will be tested using Non-Destructive Examination (NDE).

3.9 National Grid's overhead and burden rates used in this estimate were based on the May 2020 SAGE Templates.

3.10 Stock material pricing is based on SAGE Estimating database inventory items. Non-stock material costs were obtained from vendor quotes or actual costs from past projects.

3.11 The Means and Methods for construction includes, Horizontal Directional drilling (HDD), Jack & Bore and Open Cut trench.

3.12 The project requires the completion of a SWPPP along with weekly inspections.

3.13 Tree clearing will not be part of the competitive bid.

3.14 Work order 90000209245 for the 20 Land Easements was created for $375,000.

3.15 Odorant injection and monitoring will be required and performed by National Grid I&R Crew.

4.0 ASSUMPTIONS

4.1 The 24-week construction duration is based upon the preliminary construction schedule.
4.2 The project will be started and completed in Fiscal Year 2022.
4.3 The Contractor's weekly work hours consist of working six (6) days per week and 12 hours per day.
4.4 Crew productivity for the open trench portion of this project assumes 120 ft of steel gas main installed per day.
4.5 The total installed pipe length does not exceed 14,730 ft. (14,370' Main W/O and 360' GRS W/O.
4.6 The open cut trench length does not exceed 8,566 ft (8,326 of 12" ST and 240 ft of 16" ST main.
4.7 Three (3) separate horizontal directional drill segments required. The total length of main installed by HDD will be 5,979 ft of 12" ST gas main.
4.8 Three (3) separate Jack and Bore segments required. The total length of main installed by Jack & Bore will be 185 ft of 12" ST gas main.
4.9 The wetlands and marshaling yards will require the placement of 1,639 mats.
4.10 5.3 acres of tree of clearing.
4.11 There will be One (1) Main Tie-In consisting of One (1) 12" TDW Steel 3 Way Fitting.
4.12 Three (3) Full-Time Contractor Supervisors required during construction activities.
4.13 One (1) Full-Time Electrical Spotter required for the duration of the project.
4.14 One (1) Full-Time On-Site Safety Person required for the duration of the project.
4.15 National Grid will require a 3rd party Contractor (Kleinfelder) on site for additional oversight during the HDD activities.
4.16 Work Area protection and traffic control costs for the duration of the project.
4.17 Pressure test will be pneumatic and not a hydrotest.

5.0 EXCLUSIONS

5.1 Permit stipulations requiring reduced day time or night time work hours.
5.2 Additional labor costs for working during the winter months.
5.3 Delay costs for the handling of any environmental hazardous spoils.
5.4 Delay costs for the productivity loses for major weather events.
5.5 Delay costs for contractor losses with unsuccessful HDD bores or consolidated rock being encountered.
5.6 National Grid internal policy change requiring a Certified Welding Inspector (CWI) be present for all welding activities.
5.7 Dewatering.
5.8 Environmental Monitoring.
5.9 Scar Guard on the HDD Pipe.

6.0 RISK / CONTINGENCY

The risk-based contingency figures (P50/P80) presented in this estimate are intended to cover risks associated with the presented scope. Scope changes are not included.

6.1 The estimate includes a contingency of 5%.

6.2 A risk meeting was held on 07/14/2020.
- 6.2.1 Risk Dollars P50 / EV - $940,870
- 6.2.2 Risk Dollars P80 / SC - $1,936,533

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	C082363-RTE 146 Rexford-4.3	

7.0 ESCALATION

Total Estimate (Direct + Indirect Costs)				
	CAPEX	OPEX	COR	Total
Estimate Value (CY 2020)	$ 14,794,423	$ -	$ -	$ 14,794,423
Estimate Value Including Escalation (CY 2021)	$ 15,054,427	$ -	$ -	$ 15,054,427
Estimate Value Including Escalation (CY 2022)	$ 15,320,305	$ -	$ -	$ 15,320,305
Estimate Value Including Escalation (CY 2023)	$ 15,592,198	$ -	$ -	$ 15,592,198
Escalation Percentage CY 2021	1.76%			

8.0 ESTIMATE HISTORY

8.1 Stage 4.3 Estimate
- 8.1.1 Date:08/18/2020
- 8.1.2 Base Total: $16,347,514
- 8.1.3 P50 Total: $17,288,384
- 8.1.4 P80 Total: $18,284,047

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Estimate Totals

C082363-RTE 146 Rexford-4.3

Utility	**Gas**	Proj Number	**2017091481133**	Est Number	
Proj Type	**Gas Distribution**	Funding Proj	**C082363**	Est Stage	**4.3**
Proj Lead	**Hill, William**	Work Order	**10029154763, 90000200602, 90000209245**	Est Version	**1**
Estimator	**Coppola, Brian**	State	**NY**	Est Type	**Complex**
Company	**5210 - Niagara Mohawk Power Corp**	Fiscal Yr	**2022**	Last Update	**8/18/2020 10:54:12 AM**
Base Template	**Gas - 5210 - NY - NIMO Gas - Apr 2020**				

	CAP	OPE	COR	Total
Base Total	**15,569,063**	**-**	**-**	**15,569,063**
Base + Contingency Total	**16,347,516**	**-**	**-**	**16,347,516**
Base + Contingency + P50 Total				**17,288,386**
Base + Contingency + P80 Total				**18,284,049**

Prepared by: 08/18/202

Reviewed by:

Reviewed by: 08/19/2020

Reviewed by: Paul A. Canna 08/19/202

Approved by: 08/19/2020

This estimate is valid until: 02/18/202

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Estimate Summary

C082363-RTE 146 Rexford-4.3

Utility	**Gas**	Proj Number	**2017091481133**	Est Number	
Proj Type	**Gas Distribution**	Funding Proj	**C082363**	Est Stage	**4.3**
Proj Lead	**Hill, William**	Work Order	**10029154763, 90000200602, 90000209245**	Est Version	**1**
Estimator	**Coppola, Brian**	State	**NY**	Est Type	**Complex**
Company	**5210 - Niagara Mohawk Power Corp**	Fiscal Yr	**2022**	Last Update	**8/18/2020 10:54:12 AM**
Base Template	**Gas - 5210 - NY - NIMO Gas - Apr 2020**				

		CAP	OPE	COR	Total
Labor - Management		52,188	-	-	52,188
Labor - Craft		1,265,568	-	-	1,265,568
Material - Stock		56,479	-	-	56,479
Material - Non-stock		1,070,496	-	-	1,070,496
Subcontractor		3,653,466	-	-	3,653,466
Equipment		4,197,476	-	-	4,197,476
Other		495,556	-	-	495,556
Subtotal (by Category)		**10,791,231**	**-**	**-**	**10,791,231**
Material Tax	7.88%	88,806	-	-	88,806
Stores Material Handling	18.00%	10,967	-	-	10,967
Overhead - Management	71.40%	37,262	-	-	37,262
Overhead - Craft	61.95%	784,019	-	-	784,019
COD	25.00%	2,803,982	-	-	2,803,982
A&G	2.48%	278,155	-	-	278,155
AFUDC	-	505,747	-	-	505,747
Escalation	1.76%	268,893	-	-	268,893
Base Total		**15,569,063**	**-**	**-**	**15,569,063**
Contingency	5.00%	778,453	-	-	778,453
Base + Contingency Total		**16,347,516**	**-**	**-**	**16,347,516**
P50					940,870
Base + Contingency + P50 Total					**17,288,386**
P80					1,936,533
Base + Contingency + P80 Total					**18,284,049**

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Summary by Division

C082363-RTE 146 Rexford-4.3

Utility	**Gas**	Proj Number	**2017091481133**	Est Number	
Proj Type	**Gas Distribution**	Funding Proj	**C082363**	Est Stage	**4.3**
Proj Lead	**Hill, William**	Work Order	**10029154763, 90000200602, 90000209245**	Est Version	**1**
Estimator	**Coppola, Brian**	State	**NY**	Est Type	**Complex**
Company	**5210 - Niagara Mohawk Power Corp**	Fiscal Yr	**2022**	Last Update	**8/18/2020 10:54:12 AM**
Base Template	**Gas - 5210 - NY - NIMO Gas - Apr 2020**				

	Lab Hrs	Labor	Material	Sub	Equip	Other	Total
01 - General Requirements	2,281	117,033	82,218	3,461,466	7,331	495,556	4,163,604
02 - Existing Conditions	19	975	-	-	406	-	1,381
03 - Concrete	149	8,337	10,020	-	3,224	-	21,581
05 - Metals	-	-	3,218	-	-	-	3,218
13 - Special Construction	243	12,028	1,837	-	783	-	14,649
26 - Electrical	293	17,922	11,440	-	6,382	-	35,744
31 - Earthwork	6,708	359,777	71,699	192,000	3,886,456	-	4,509,932
32 - Exterior Improvements	601	21,240	26,280	-	7,626	-	55,146
33 - Utilities	96	4,681	15,382	-	1,050	-	21,113
40 - Process Interconnections	13,315	775,761	784,429	-	284,218	-	1,844,409
51 -	-	-	21,663	-	-	-	21,663
53 -	-	-	5,002	-	-	-	5,002
90 -	-	-	93,787	-	-	-	93,787
Subtotal Cost (by Division)	**23,704**	**1,317,756**	**1,126,976**	**3,653,466**	**4,197,476**	**495,556**	**10,791,231**

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Estimate Detail

C082363-RTE 146 Rexford-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount (S)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	*** Unassigned**		**6,694**	**348,922**	**176,960**	**3,641,466**	**3,842,226**	**495,556**	**8,505,130**
	*** Unassigned**		**6,694**	**348,922**	**176,960**	**3,641,466**	**3,842,226**	**495,556**	**8,505,130**
	Engineering & Design Fees TRC	1 ls	-	-	-	48,370	-	-	48,370
	Engineering & Design Fees TRC (Actual)	1 ls	-	-	-	69,004	-	-	69,004
	Contractor Fee	1 ls	-	-	-	1,150,000	-	-	1,150,000
	Contractor Safety Rep	24 wk	-	-	-	46,200	-	-	46,200
	Contractor PM	960 mh	-	-	-	81,600	-	-	81,600
	Performance and Payment Bonds (1%)	1 ls	-	-	-	75,000	-	-	75,000
	Survey Consultant CT MALE (Actual)	1 ls	-	-	-	29,000	-	-	29,000
	Supervisor - Contractor (Sky Testing (Actual)	1 ls	-	-	-	5,275	-	-	5,275
	X-Ray	20 dy	-	-	-	36,100	-	-	36,100
	Environmental Consultant Fisher	1 ls	-	-	-	41,891	-	-	41,891
	Environmental Consultant Fisher Assoc (Actual)	1 ls	-	-	-	23,787	-	-	23,787
	Stewart Title and Waypoint (Actual)	1 ls	-	-	-	-	-	155	155
	NGrid Senior Engineer	120 mh	120	5,406	-	-	-	-	5,406
	NGrid Senior Engineer (Actual)	14 mh	14	631	-	-	-	-	631
	NGrid Lead Scientist / Environmetal Engineer	8 mh	8	408	-	-	-	-	408
	NGrid Lead Scientist / Environmetal Engineer (Actual)	23 mh	23	1,173	-	-	-	-	1,173
	NGrid Estimator	40 mh	40	1,862	-	-	-	-	1,862
	NGrid Estimator (Actual)	26 mh	26	1,210	-	-	-	-	1,210
	NGrid Designer (Actual)	21 mh	21	919	-	-	-	-	919
	Maps and Records	160 mh	160	7,173	-	-	-	-	7,173
	Maps and Records (Actual)	3 mh	3	134	-	-	-	-	134
	NGrid Lead Project Manager	300 mh	300	17,526	-	-	-	-	17,526
	NGrid Lead Project Manager (Actual)	12 mh	12	701	-	-	-	-	701
	NGrid Lead Project Development	60 mh	60	3,505	-	-	-	-	3,505
	NGrid Lead Project Development (Actual)	218 mh	218	12,706	-	-	-	-	12,706
	NGrid Lead Community Outreach	40 mh	40	2,135	-	-	480	-	2,615
	NGrid Senior Gas Sys Operator	2 mh	2	98	-	-	-	-	98
	NGrid Real Estate Representative (Actual)	17 mh	17	784	-	-	-	-	784
	NGrid Real Estate Representative Union	80 mh	80	3,689	-	-	-	-	3,689
	NGrid Real Estate Representative Union (Actual)	152 mh	152	7,023	-	-	-	-	7,023

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Estimate Detail

C082363-RTE 146 Rexford-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	NGrid Senior Counsel	8 mh	8	792	-	-	-	-	792
	NGrid Senior Counsel (Actual)	6 mh	6	545	-	-	-	-	545
	NGrid Senior Quality Inspector	60 mh	60	2,707	-	-	720	-	3,427
	NGrid Senior Surveyor	80 mh	80	3,689	-	-	-	-	3,689
	NGrid Senior Surveyor (Actual)	304 mh	304	14,017	-	-	-	-	14,017
	NGrid 3 Man I&R Crew	120 mh	120	5,859	-	-	1,200	-	7,059
	Tree Clearing quote from Forestry 5.3 acres	1 ls	-	-	-	192,000	-	-	192,000
	Payment to Town for Tree Plantings and Special Seeding	1 ls	-	-	-	-	-	14,000	14,000
	Engineering & HDD Design Fees Kleinfelder	1 ls	-	-	-	10,246	-	-	10,246
	HDD Design Fees and Test Holes Kleinfelder (Actual)	1 ls	-	-	-	182,234	-	-	182,234
	Home Office Travel & Expenses	1 ls	-	-	-	-	-	2,000	2,000
	Home Office Travel & Expenses (Actual)	1 ls	-	-	-	-	-	2,742	2,742
	Work Order Transer (Actual)	1 ls	-	-	-	-	-	101,659	101,659
	Northeastern Land Service (Actual)	1 ls	-	-	-	7,591	-	-	7,591
	Easements	1 ls	-	-	-	-	-	306,002	306,002
	Easements (Actual)	1 ls	-	-	-	-	-	68,998	68,998
	Jack and Bore #1 MOB Stn .73 to Stn 1.19	1 dy	32	1,760	-	-	3,200	-	4,960
	Jack and Bore DEMOB	1 dy	32	1,760	-	-	3,200	-	4,960
	Jack and Bore Pilot Holes	46 lf	15	810	-	-	9,200	-	10,010
	Jack and Bore Reaming	46 lf	7	402	-	-	4,571	-	4,974
	Jack and Bore Pipe Pull	46 lf	1	68	-	-	776	-	845
	HDD # 1 MOB Stn 13 to Stn 39	1 dy	32	1,760	-	-	12,800	-	14,560
	HDD DEMOB	1 dy	32	1,760	-	-	12,800	-	14,560
	HDD Pilot Holes	2,610 lf	835	45,936	-	-	1,044,000	-	1,089,936
	HDD Reaming	2,610 lf	415	22,824	-	-	518,738	-	541,562
	HDD Pipe Pull	2,610 lf	23	1,292	-	-	29,363	-	30,654
	HDD #2 MOB Stn 61.35 to Stn 74.10	1 dy	32	1,760	-	-	12,800	-	14,560
	HDD DEMOB	1 dy	32	1,760	-	-	12,800	-	14,560
	HDD Pilot Holes	1,275 lf	408	22,440	-	-	510,000	-	532,440
	HDD Reaming	1,275 lf	203	11,150	-	-	253,406	-	264,556
	HDD Pipe Pull	1,275 lf	11	631	-	-	14,344	-	14,975
	Jack and Bore #2 MOB Stn 98.52 to Stn 99	1 dy	32	1,760	-	-	3,200	-	4,960
	Jack and Bore DEMOB	1 dy	32	1,760	-	-	3,200	-	4,960
	Jack and Bore Pilot Holes	48 lf	15	845	-	-	9,907	-	10,752
	Jack and Bore Reaming	48 lf	8	420	-	-	4,923	-	5,342
	Jack and Bore Pipe Pull	48 lf	1	71	-	-	836	-	907

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Estimate Detail

C082363-RTE 146 Rexford-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	HDD #3 MOB Stn 112.43 to Stn 133.36	1 dy	32	1,760	-	-	12,800	-	14,560
	HDD DEMOB	1 dy	32	1,760	-	-	12,800	-	14,560
	HDD Pilot Holes	2,094 lf	670	36,854	-	-	837,600	-	874,454
	HDD Reaming	2,094 lf	333	18,312	-	-	416,183	-	434,495
	HDD Pipe Pull	2,094 lf	19	1,037	-	-	23,558	-	24,594
	Jack and Bore #3 MOB Stn 135 to Stn 136	1 dy	32	1,760	-	-	3,200	-	4,960
	Jack and Bore DEMOB	1 dy	32	1,760	-	-	3,200	-	4,960
	Jack and Bore Pilot Holes	90 lf	29	1,584	-	-	25,920	-	27,504
	Jack and Bore Reaming	90 lf	14	787	-	-	12,879	-	13,666
	Jack and Bore Pipe Pull	90 lf	2	134	-	-	2,187	-	2,321
	Hydroseeding 8206 x 4 ft	32,824 sf	420	12,865	3,282	-	4,239	-	20,387
	Hydoseeding Drill Pits	3,600 sf	46	1,411	360	-	465	-	2,236
	Silt Fence	5,190 lf	104	5,423	54,703	-	2,257	-	62,383
	Traffic Plan Quote	1 ls	-	-	-	49,000	-	-	49,000
	Matting- Wetlands	954 ea	-	-	-	477,000	-	-	477,000
	Extra PIPE, 12" CS, FBE, .375 w.t API 5l X42	200 lf	-	-	7,022	-	-	-	7,022
	Extra PIPE, 12" CS, POWERCRETE, .375 w.t API 5l X42	200 ea	-	-	9,862	-	-	-	9,862
	CAP, 12", WELD,.375	13 ea	-	-	3,081	-	-	-	3,081
	EXTRA ELBOW, 12", 45 DEG,SEGMENTABLE, WELD. .375 W.T	7 ea	-	-	4,543	-	-	-	4,543
	EXTRA ELBOW, 12", 90DEG,SEGMENTABLE, WELD. .375 W.T	2 ea	-	-	1,718	-	-	-	1,718
	1-1/2 3000# SOCKOLET	4 ea	-	-	356	-	-	-	356
	1-1/4 TEE SERVICE MUELLER CURB VALVE	4 ea	-	-	382	-	-	-	382
	BARRIER BOARD	6 ea	-	-	237	-	-	-	237
	2" THREADOLET	14 ea	-	-	321	-	-	-	321
	2 X4 NIPPLE	6 ea	-	-	131	-	-	-	131
	2' BALL VALVE	6 ea	-	-	557	-	-	-	557
	2" PLUG VALVE	6 ea	-	-	354	-	-	-	354
	1' THREADOLET	8 ea	-	-	102	-	-	-	102
	VALVE, PLUG IRON 1IN 175PSIG THD (SAP # 9312256)	4 ea	-	-	59	-	-	-	59
	PIPE, CS 1-1/2IN 145WL GR B BARE PL NTP (SAP # 9312352)	20 lf	-	-	141	-	-	-	141
	PIPE, CS 1IN 133WL GR B PRTC PL NTP 21FT (SAP # 9312236)	80 lf	-	-	1,097	-	-	-	1,097
	NUT, ADAPTR VALVE OPR 2IN SQ (SAP # 9315459)	2 ea	-	-	48	-	-	-	48

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Estimate Detail

C082363-RTE 146 Rexford-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	ELBOW, CS 1IN 90DEG 133WL GR B SW 3000PS (SAP # 9315524)	4 ea	-	-	15	-	-	-	15
	PLUG, THD CI BLK 1IN IPS CORED SQ HEAD (SAP # 9312287)	5 ea	-	-	5	-	-	-	5
	BOX, RDWY 12IN SQ COV CI GAS DRIP (SAP # 9312290)	4 ea	-	-	1,491	-	-	-	1,491
	BOX, RDWY PLSTC 8-3/4 ID BASE 5-1/2 RISE (SAP # 9315772)	6 ea	-	-	294	-	-	-	294
	COUPLING, HALF CS 1IN THD 3000PSIG A105 (SAP # 9315745)	1 ea	-	-	1	-	-	-	1
	PADDING, PIPE 3/8INx60INx140FT PLSTC (SAP # 9315631)	1 roll	-	-	836	-	-	-	836
	PIPE, CS 2IN 154WL GR B BARE BEV NTP API (SAP # 9312351)	80 lf	-	-	301	-	-	-	301
	TEE, WLD LINE STOPPER FTG 12IN IPS (SAP # 9315494)	1 ea	-	-	4,086	-	-	-	4,086
	MARKER, PPLN Y TEST STA 3 -1/2INx84IN L (SAP # 9312342)	8 ea	-	-	282	-	-	-	282
	CAUTION TAPE	15 roll	-	-	528	-	-	-	528
	Material Allowance for Pipe	1 ls	-	-	5,000	-	-	-	5,000
	12 (16 X 50) temporary construction entrances	8,000 sf	96	4,960	8,672	-	2,088	-	15,720
	Tie-In West Side	1 dy	72	3,806	-	-	1,693	-	5,499
	Material Allowance Labor for Pipe	2 dy	80	4,229	-	-	1,881	-	6,109
	Supervisor - Contractor HDD	20 wk	-	-	-	124,600	-	-	124,600
	Supervisor - Contractor Open Cut	16 wk	-	-	-	99,680	-	-	99,680
	Supervisor - Contractor Reg Station	12 wk	-	-	-	74,760	-	-	74,760
	Kleinfelder HDD Supervision Quote	96 dy	-	-	-	199,680	-	-	199,680
	Kleinfelder Final Reports	1 ls	-	-	-	15,000	-	-	15,000
	Pressure Testing 146 Pipe	2 dy	96	5,863	-	-	2,088	-	7,951
	Final Commissioning	3 dy	144	8,330	-	-	3,132	-	11,462
	Pressure Testing GRS	2 dy	96	5,554	-	-	2,088	-	7,642
	Material Allowance Labor for GRS	2 dy	80	4,229	-	-	1,881	-	6,109
	Material Allowance for GRS	1 ls	-	-	5,000	-	-	-	5,000
	APX Cabinet for Regulator	1 ea	-	-	15,357	-	-	-	15,357
	APX Cabinets for Relief	2 ea	-	-	30,714	-	-	-	30,714
	Bollards	21 ea	84	4,962	5,250	-	1,827	-	12,038
	Crushed Stone for Cabinets	270 sf	3	169	114	-	70	-	354
	Runner Crush Driveway 25 x 35	875 sf	11	549	371	-	228	-	1,147

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Estimate Detail

C082363-RTE 146 Rexford-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount (S)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	CAUTION TAPE	1 roll	-	-	35	-	-	-	35
	CAP, CS 12IN COMP LINE VENT BLT RESTRAIN (SAP # 9315212)	1 ea	-	-	456	-	-	-	456
	CAP, CS 6IN COMP LINE VENT BLT RESTRAINT (SAP # 9314880)	2 ea	-	-	482	-	-	-	482
	WAX TAPE	1 roll	-	-	35	-	-	-	35
	CAP, CS 16IN COMP 1IN VENT BLT NON-RESTR (SAP # 9307775)	1 ea	-	-	394	-	-	-	394
	PADDING, PIPE 3/8INx60INx140FT PLSTC (SAP # 9315631)	1 roll	-	-	836	-	-	-	836
	Matting -Ag Field/Residential	685 ea	-	-	-	342,500	-	-	342,500
	2 TemporaryTraffic Lights	52 dy	-	-	-	7,800	-	-	7,800
	Traffic Control 2 Flaggers	120 dy	-	-	-	72,000	-	-	72,000
	Traffic Control 2 Flaggers (Donnelly)	52 dy	-	-	-	117,000	-	-	117,000
	Intertek Moody Pipe Inspection	1 ls	-	-	-	10,500	-	-	10,500
	Environmental Consultant AECOM	1 ls	-	-	-	2,000	-	-	2,000
	Environmental Consultant AECOM (Actual)	1 ls	-	-	-	5,014	-	-	5,014
	Environmental Consultant NRC (Actual)	1 ls	-	-	-	435	-	-	435
	NGrid 3 Man I&R Crew for Odorant Injection	48 mh	48	2,344	-	-	480	-	2,824
	Contractor Electrical Spotter	24 wk	-	-	-	46,200	-	-	46,200
	Trench Breakers	12 ea	24	1,448	6,360	-	524	-	8,332
	Water Bars	13 ea	23	1,373	1,690	-	496	-	3,559
A10	**FOUNDATIONS & CONCRETE**		**51**	**2,653**	**7,612**	**-**	**1,097**	**-**	**11,362**
A10.30	**Concrete Pads for Cabinets**		**51**	**2,653**	**7,612**	**-**	**1,097**	**-**	**11,362**
	Concrete Forms Pad (incl Ties and Bracing)	132 sf	26	1,379	173	-	574	-	2,127
	Concrete Rebar Grade 60 (415MPa) Fabricated incl Accessories #3 to #7 (10M to 22M)	1 tn	6	334	1,024	-	139	-	1,498
	Anchor Bolt 12x4 inch (300x100mm) - 1 inch (25mm) Dia - (Incl. Nuts, Jam Nuts, washers)	144 ea	-	-	1,609	-	-	-	1,609
	Concrete Plant Mixed and Delivered 6000 psi (40 Mpa)	11 cy	-	-	2,792	-	-	-	2,792
	Concrete Foundation Placement from Plant-Mixed Truck	11 cy	5	268	-	-	111	-	379
	Concrete Finish - Screed Only	288 sf	3	150	-	-	63	-	213
	Spray Curing Compound	288 sf	1	28	2	-	5	-	36
	Concrete Forms Strip, Coat, Store	132 sf	1	34	10	-	14	-	59

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Estimate Detail

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Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Concrete Forms Pad (incl Ties and Bracing)	36 sf	7	376	47	-	157	-	580
	Concrete Rebar Grade 60 (415MPa) Fabricated incl Accessories #3 to #7 (10M to 22M)	0 tn	1	31	80	-	13	-	124
	Anchor Bolt 12x4 inch (300x100mm) - 1 inch (25mm) Dia - (Incl. Nuts, Jam Nuts, washers)	144 ea	-	-	1,609	-	-	-	1,609
	Concrete Plant Mixed and Delivered 6000 psi (40 Mpa)	1 cy	-	-	262	-	-	-	262
	Concrete Foundation Placement from Plant-Mixed Truck	1 cy	0	25	-	-	10	-	36
	Concrete Finish - Screed Only	27 sf	0	14	-	-	6	-	20
	Spray Curing Compound	27 sf	0	3	0	-	0	-	3
	Concrete Forms Strip, Coat, Store	36 sf	0	9	3	-	4	-	16
D50.1	**ELECTRICAL SERVICE & DISTRIBUTION, RACEWAY, CONDUCTORS & GROUNDS**		**536**	**29,951**	**16,346**	**-**	**7,165**	**-**	**53,462**
D50.121	**2" Robroy**		**293**	**17,922**	**11,440**	**-**	**6,382**	**-**	**35,744**
	Conduit Run with Couplings, Bends, Adapters, Etc Plastic Coated Steel 2 inch (53mm)	440 lf	293	17,922	11,440	-	6,382	-	35,744
D50.190	**Cathodic Protection**		**243**	**12,028**	**4,906**	**-**	**783**	**-**	**17,718**
	Cathodic Protection Anode - Magnesium - 17 lb	32 ea	-	-	2,196	-	-	-	2,196
	Cathodic Protection - Cable HMWPE - #1	160 lf	-	-	563	-	-	-	563
	Cathodic Protection - Install Anode (Incl Cable / Excl excavation)	32 ea	128	6,250	239	-	428	-	6,916
	Cathodic Protection - Conductive Backfill	96 cf	8	375	1,023	-	26	-	1,424
	Cathodic Protection - Weld Wire to Pipe	32 ea	32	1,723	239	-	83	-	2,044
	Cathodic Protection - Test Station (incl terminations)	8 ea	48	2,344	-	-	160	-	2,504
	ANODE, MAG BAG 17LB 3.5INx25IN (SAP # 9311183)	4 ea	-	-	274	-	-	-	274
	Cathodic Protection - Cable HMWPE - #10	65 lf	-	-	36	-	-	-	36
	Cathodic Protection - Install Anode (Incl Cable / Excl excavation)	4 ea	16	781	30	-	53	-	865
	Cathodic Protection - Conductive Backfill	12 cf	1	47	128	-	3	-	178
	Cathodic Protection - Weld Wire to Pipe	4 ea	4	215	30	-	10	-	256
	Cathodic Protection - Test Station (incl terminations)	1 ea	6	293	149	-	20	-	462

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Estimate Detail

C082363-RTE 146 Rexford-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
G10	**SITEWORK/EARTHWORK**		**3,343**	**174,643**	**72,075**	**-**	**72,724**	**-**	**319,443**
G10.08	**Paving Remove Stn 134 to Stn 137**		**56**	**2,887**	**376**	**-**	**1,216**	**-**	**4,480**
	Saw Cut Asphalt 6" Thick	280 lf	19	975	-	-	406	-	1,381
	Demolition-Road Paving	156 sy	14	722	376	-	301	-	1,400
	Haul Waste Excavation to Disposal	26 cy	23	1,190	-	-	509	-	1,699
G10.19	**Trench Excavation Stn 0 to Stn .73**		**3,288**	**171,756**	**71,699**	**-**	**71,509**	**-**	**314,963**
	Excavation-Trench-Utilities (No Haul)	41 cy	5	283	-	-	118	-	400
	Utility Backfill/Compact	41 cy	13	678	481	-	282	-	1,442
	Haul Waste Excavation to Disposal	4 cy	4	188	-	-	78	-	267
	Excavation-Trench-Utilities (No Haul)	311 cy	41	2,167	-	-	902	-	3,069
	Utility Backfill/Compact	311 cy	100	5,202	3,691	-	2,165	-	11,058
	Haul Waste Excavation to Disposal	31 cy	28	1,445	-	-	601	-	2,046
	Excavation-Trench-Utilities (No Haul)	657 cy	88	4,575	-	-	1,904	-	6,479
	Utility Backfill/Compact	657 cy	210	10,979	7,791	-	4,569	-	23,340
	Haul Waste Excavation to Disposal	66 cy	58	3,050	-	-	1,269	-	4,319
	Excavation-Trench-Utilities (No Haul)	74 cy	10	516	-	-	215	-	731
	Utility Backfill/Compact	74 cy	24	1,239	879	-	515	-	2,633
	Haul Waste Excavation to Disposal	7 cy	7	344	-	-	143	-	487
	Excavation-Trench-Utilities (No Haul)	1,235 cy	165	8,604	-	-	3,581	-	12,184
	Utility Backfill/Compact	1,235 cy	395	20,649	14,653	-	8,594	-	43,896
	Haul Waste Excavation to Disposal	124 cy	110	5,736	-	-	2,387	-	8,123
	Haul Waste Excavation to Disposal	7 cy	7	344	-	-	143	-	487
	Excavation-Trench-Utilities (No Haul)	74 cy	10	516	-	-	215	-	731
	Utility Backfill/Compact	74 cy	24	1,239	879	-	515	-	2,633
	Excavation-Trench-Utilities (No Haul)	1,355 cy	181	9,440	-	-	3,929	-	13,368
	Utility Backfill/Compact	1,355 cy	434	22,656	16,077	-	9,429	-	48,161
	Haul Waste Excavation to Disposal	136 cy	120	6,293	-	-	2,619	-	8,912
	Excavation-Trench-Utilities (No Haul)	311 cy	41	2,167	-	-	902	-	3,069
	Utility Backfill/Compact	311 cy	100	5,202	3,691	-	2,165	-	11,058
	Haul Waste Excavation to Disposal	31 cy	28	1,445	-	-	601	-	2,046
	Excavation-Trench-Utilities (No Haul)	747 cy	100	5,206	-	-	2,166	-	7,372

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Estimate Detail

C082363-RTE 146 Rexford-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount (S)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Utility Backfill/Compact	747 cy	239	12,494	8,866	-	5,199	-	26,559
	Haul Waste Excavation to Disposal	75 cy	66	3,470	-	-	1,444	-	4,915
	Excavation-Trench-Utilities (No Haul)	90 cy	12	627	-	-	261	-	888
	Utility Backfill/Compact	90 cy	29	1,505	1,068	-	626	-	3,199
	Haul Waste Excavation to Disposal	9 cy	8	418	-	-	174	-	592
	Excavation-Trench-Utilities (No Haul)	311 cy	41	2,167	-	-	902	-	3,069
	Utility Backfill/Compact	311 cy	100	5,202	3,691	-	2,165	-	11,058
	Haul Waste Excavation to Disposal	31 cy	28	1,445	-	-	601	-	2,046
	Excavation-Trench-Utilities (No Haul)	434 cy	58	3,027	-	-	1,260	-	4,286
	Utility Backfill/Compact	434 cy	139	7,264	5,155	-	3,023	-	15,442
	Haul Waste Excavation to Disposal	43 cy	39	2,018	-	-	840	-	2,857
	Excavation-Trench-Utilities (No Haul)	49 cy	7	341	-	-	142	-	482
	Utility Backfill/Compact	49 cy	16	817	580	-	340	-	1,738
	Haul Waste Excavation to Disposal	5 cy	4	224	-	-	96	-	320
	Excavation-Trench-Utilities (No Haul)	114 cy	15	793	-	-	330	-	1,124
	Utility Backfill/Compact	114 cy	36	1,904	1,351	-	792	-	4,048
	Haul Waste Excavation to Disposal	11 cy	10	523	-	-	224	-	746
	Excavation-Trench-Utilities (No Haul)	36 cy	5	252	-	-	105	-	356
	Utility Backfill/Compact	36 cy	12	604	428	-	251	-	1,283
	Haul Waste Excavation to Disposal	4 cy	3	166	-	-	71	-	237
	Excavation-Trench-Utilities (No Haul)	130 cy	17	908	-	-	378	-	1,286
	Utility Backfill/Compact	130 cy	42	2,180	1,547	-	907	-	4,634
	Haul Waste Excavation to Disposal	13 cy	12	598	-	-	256	-	854
	Excavation-Trench-Utilities (No Haul)	59 cy	8	413	-	-	172	-	585
	Utility Backfill/Compact	59 cy	19	991	703	-	412	-	2,106
	Haul Waste Excavation to Disposal	6 cy	5	272	-	-	116	-	388
	Excavation-Trench-Utilities (No Haul)	14 cy	2	98	-	-	41	-	138
	Utility Backfill/Compact	14 cy	4	234	166	-	97	-	498
	Haul Waste Excavation to Disposal	14 cy	12	642	-	-	275	-	917

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Estimate Detail

C082363-RTE 146 Rexford-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
G20	**SITE IMPROVEMENTS**		**27**	**1,401**	**13,480**	**-**	**585**	**-**	**15,466**
G20.13	**Paving Jack and Bore Pits and Driveways**		**27**	**1,401**	**13,480**	**-**	**585**	**-**	**15,466**
	Rough Grading	139 sy	2	115	-	-	49	-	164
	Asphalt Paving 6 inch (150mm)	1,250 sf	12	643	6,740	-	268	-	7,651
	Asphalt Paving 6 inch (150mm)	1,250 sf	12	643	6,740	-	268	-	7,651
P25-	**PIPING CS API 5L**		**12,419**	**724,285**	**753,778**	**-**	**264,798**	**-**	**1,742,861**
P2512	**Pipe Install & Tie-In Fitting Stn 0 to Stn .73**		**12,419**	**724,285**	**753,778**	**-**	**264,798**	**-**	**1,742,861**
	PIPE, 12" CS, FBE, .375 w.t API 5l X42	73 lf	-	-	2,563	-	-	-	2,563
	VALVE, 12" PLUG VALVE , BUTT WELD	1 ea	-	-	11,800	-	-	-	11,800
	Pipe Erection-Handle Valves-Metal-Cls 300 (PN50) 12 Inch (300mm)	1 ea	7	358	-	-	118	-	476
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	73 lf	44	2,534	-	-	952	-	3,486
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	15 ea	40	2,391	-	-	835	-	3,226
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	15 ea	52	3,097	106	-	1,082	-	4,284
	ELBOW, 12", 90 DEG,SEGMENTABLE, WELD. .375 W.T	2 ea	-	-	1,718	-	-	-	1,718
	ELBOW, 12", 45 DEG,SEGMENTABLE, WELD. .375 W.T	2 ea	-	-	1,298	-	-	-	1,298
	Pipeline Insulator	1 ea	-	-	9,461	-	-	-	9,461
	Pipe Erection-Handle Fittings-Metal-Std 12 Inch (300mm)	5 ea	7	385	-	-	145	-	530
	PIPE, 12" CS, FBE, .375 w.t API 5l X42	1,182 lf	-	-	41,500	-	-	-	41,500
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	1,182 lf	709	41,027	-	-	15,422	-	56,449
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	35 ea	93	5,578	-	-	1,948	-	7,526
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	35 ea	121	7,227	246	-	2,524	-	9,997
	ELBOW, 12", 90 DEG,SEGMENTABLE, WELD. .375 W.T	1 ea	-	-	859	-	-	-	859
	ELBOW, 12", 45 DEG,SEGMENTABLE, WELD. .375 W.T	2 ea	-	-	1,298	-	-	-	1,298
	Pipe Erection-Handle Fittings-Metal-Std 12 Inch (300mm)	3 ea	4	231	-	-	87	-	318
	PIPE, 12" CS, POWERCRETE, .375 w.t API 5l X42	2,610 lf	-	-	128,699	-	-	-	128,699
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	2,610 lf	1,566	90,593	-	-	34,053	-	124,646
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	67 ea	178	10,679	-	-	3,729	-	14,408

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Estimate Detail

C082363-RTE 146 Rexford-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	67 ea	231	13,834	471	-	4,831	-	19,137
	PIPE, 12" CS, FBE, .375 w.t API 5l X42	2,223 lf	-	-	78,050	-	-	-	78,050
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	2,223 lf	1,334	77,160	-	-	29,003	-	106,164
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	65 ea	173	10,360	-	-	3,618	-	13,977
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	65 ea	224	13,421	457	-	4,687	-	18,566
	ELBOW, 12", 45 DEG,SEGMENTABLE, WELD. .375 W.T	2 ea	-	-	1,298	-	-	-	1,298
	Pipe Erection-Handle Fittings-Metal-Std 12 Inch (300mm)	2 ea	3	154	-	-	58	-	212
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	33 ea	114	6,814	232	-	2,379	-	9,426
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	33 ea	88	5,260	-	-	1,837	-	7,096
	PIPE, 12" CS, POWERCRETE, .375 w.t API 5l X42	1,275 lf	-	-	62,870	-	-	-	62,870
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	1,275 lf	765	44,255	-	-	16,635	-	60,890
	PIPE, 12" CS, FBE, .375 w.t API 5l X42	2,439 lf	-	-	85,633	-	-	-	85,633
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	2,439 lf	1,463	84,658	-	-	31,822	-	116,479
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	72 ea	192	11,475	-	-	4,007	-	15,483
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	72 ea	248	14,867	507	-	5,192	-	20,565
	ELBOW, 12", 45 DEG,SEGMENTABLE, WELD. .375 W.T	4 ea	-	-	2,596	-	-	-	2,596
	Pipe Erection-Handle Fittings-Metal-Std 12 Inch (300mm)	4 ea	5	308	-	-	116	-	424
	VALVE, 12" PLUG VALVE , BUTT WELD	1 ea	-	-	11,800	-	-	-	11,800
	Pipe Erection-Handle Valves-Metal-Cls 300 (PN50) 12 Inch (300mm)	1 ea	7	358	-	-	118	-	476
	PIPE, 12" CS, FBE, .375 w.t API 5l X42	1,345 lf	-	-	47,223	-	-	-	47,223
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	1,345 lf	807	46,685	-	-	17,548	-	64,233
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	41 ea	109	6,535	-	-	2,282	-	8,817
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	41 ea	141	8,466	288	-	2,956	-	11,711
	ELBOW, 12", 45 DEG,SEGMENTABLE, WELD. .375 W.T	2 ea	-	-	1,298	-	-	-	1,298
	Pipe Erection-Handle Fittings-Metal-Std 12 Inch (300mm)	2 ea	3	154	-	-	58	-	212

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Estimate Detail

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Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	54 ea	186	11,150	380	-	3,894	-	15,424
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	54 ea	144	8,607	-	-	3,005	-	11,612
	PIPE, 12" CS, POWERCRETE, .375 w.t API 5l X42	2,094 lf	-	-	103,255	-	-	-	103,255
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	2,094 lf	1,256	72,683	-	-	27,327	-	100,009
	PIPE, 12" CS, FBE, .375 w.t API 5l X42	162 lf	-	-	5,688	-	-	-	5,688
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	162 lf	97	5,623	-	-	2,114	-	7,737
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	8 ea	21	1,275	-	-	445	-	1,720
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	8 ea	28	1,652	56	-	577	-	2,285
	ELBOW, 12", 45 DEG,SEGMENTABLE, WELD. .375 W.T	2 ea	-	-	1,298	-	-	-	1,298
	Pipe Erection-Handle Fittings-Metal-Std 12 Inch (300mm)	2 ea	3	154	-	-	58	-	212
	PIPE, 12" CS, FBE, .375 w.t API 5l X42	782 lf	-	-	27,456	-	-	-	27,456
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	782 lf	469	27,143	-	-	10,203	-	37,346
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	34 ea	91	5,419	-	-	1,892	-	7,311
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	34 ea	117	7,020	239	-	2,452	-	9,711
	ELBOW, 12", 90 DEG,SEGMENTABLE, WELD. .375 W.T	2 ea	-	-	1,718	-	-	-	1,718
	ELBOW, 12", 45 DEG,SEGMENTABLE, WELD. .375 W.T	5 ea	-	-	3,245	-	-	-	3,245
	CAP, 12", WELD,.375	1 ea	-	-	237	-	-	-	237
	Pipe Erection-Handle Fittings-Metal-Std 12 Inch (300mm)	8 ea	11	616	-	-	232	-	848
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	6 ea	21	1,239	42	-	433	-	1,714
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	6 ea	16	956	-	-	334	-	1,290
	PIPE, 12" CS, POWERCRETE, .375 w.t API 5l X42	185 lf	-	-	9,122	-	-	-	9,122
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	185 lf	111	6,421	-	-	2,414	-	8,835
	PIPE, CS 6IN 280WL GR B PRTC BEV NTP API (SAP # 9312233)	160 lf	-	-	2,579	-	-	-	2,579
	ELBOW, CS 6IN LR90 280WL GR B BW NTP A23 (SAP # 9315528)	1 ea	-	-	53	-	-	-	53
	ELBOW, CS 6IN LR45 280WL GR B BW NTP A23 (SAP # 9315392)	2 ea	-	-	50	-	-	-	50

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Estimate Detail

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Group > Assembly	Description	Quantity	Labor Hours	Labor Amount (S)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Tee, Reducing 12 X 6	1 ea	-	-	414	-	-	-	414
	Tee, Reducing 16 X 6	1 ea	-	-	624	-	-	-	624
	Pipe Erection-Handle Fittings-Metal-Std 6 Inch (150mm)	5 ea	3	188	-	-	71	-	259
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 6 Inch (150mm)	110 lf	33	1,909	-	-	718	-	2,627
	Field Welds-Cut & Bevel-Std 6 Inch (150mm)	12 ea	16	935	-	-	327	-	1,262
	Field Butt Weld-API 5L-0.280 Wall-Std/Sch 40-6 Inch (150mm)	12 ea	19	1,120	29	-	391	-	1,540
	PIPE, CS 1IN 133WL GR B PRTC PL NTP 21FT (SAP # 9312236)	15 lf	-	-	206	-	-	-	206
	VALVE, PLUG IRON 1IN 175PSIG THD (SAP # 9312256)	3 ea	-	-	44	-	-	-	44
	PLUG, THD CI BLK 1IN IPS CORED SQ HEAD (SAP # 9312287)	3 ea	-	-	3	-	-	-	3
	TEE, SVCE VALVE 1-1/4IN WLD OUT (SAP # 9310185)	3 ea	-	-	245	-	-	-	245
	Sockolet 1-1-1/2 3000#	3 ea	-	-	168	-	-	-	168
	ELBOW, CS 1IN 90DEG 133WL GR B SW 3000PS (SAP # 9315524)	3 ea	-	-	11	-	-	-	11
	Pipe Erection-Handle Fittings-Metal-Std 1 Inch (25mm)	15 ea	3	146	-	-	55	-	201
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 1 Inch (25mm)	15 lf	4	217	-	-	82	-	298
	Field Welds-Cut & Bevel-Std 1 Inch (25mm)	30 ea	10	603	-	-	211	-	814
	Field Butt Weld-API 5L-0.133 Wall-Std/Sch 40-1 Inch (25mm)	30 ea	20	1,221	6	-	426	-	1,653
	PIPE, CS 1IN 133WL GR B PRTC PL NTP 21FT (SAP # 9312236)	10 lf	-	-	137	-	-	-	137
	VALVE, PLUG IRON 1IN 175PSIG THD (SAP # 9312256)	2 ea	-	-	29	-	-	-	29
	PLUG, THD CI BLK 1IN IPS CORED SQ HEAD (SAP # 9312287)	2 ea	-	-	2	-	-	-	2
	TEE, SVCE VALVE 1-1/4IN WLD OUT (SAP # 9310185)	2 ea	-	-	163	-	-	-	163
	Sockolet 1-1-1/2 3000#	2 ea	-	-	112	-	-	-	112
	ELBOW, CS 1IN 90DEG 133WL GR B SW 3000PS (SAP # 9315524)	2 ea	-	-	8	-	-	-	8
	Pipe Erection-Handle Fittings-Metal-Std 1 Inch (25mm)	10 ea	2	97	-	-	37	-	134
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 1 Inch (25mm)	10 lf	3	145	-	-	54	-	199

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Estimate Detail

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Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Field Welds-Cut & Bevel-Std 1 Inch (25mm)	20 ea	7	402	-	-	140	-	543
	Field Butt Weld-API 5L-0.133 Wall-Std/Sch 40-1 Inch (25mm)	20 ea	14	814	4	-	284	-	1,102
	TEE, SVCE VALVE 1-1/4IN WLD OUT (SAP # 9310185)	2 ea	-	-	163	-	-	-	163
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 1 Inch (25mm)	10 lf	3	145	-	-	54	-	199
	PIPE, CS 1IN 133WL GR B PRTC PL NTP 21FT (SAP # 9312236)	10 lf	-	-	137	-	-	-	137
	ELBOW, CS 1IN 90DEG 133WL GR B SW 3000PS (SAP # 9315524)	2 ea	-	-	8	-	-	-	8
	VALVE, PLUG IRON 1IN 175PSIG THD (SAP # 9312256)	2 ea	-	-	29	-	-	-	29
	PLUG, THD CI BLK 1IN IPS CORED SQ HEAD (SAP # 9312287)	2 ea	-	-	2	-	-	-	2
	Sockolet 1-1-1/2 3000#	2 ea	-	-	112	-	-	-	112
	Pipe Erection-Handle Fittings-Metal-Std 1 Inch (25mm)	10 ea	2	97	-	-	37	-	134
	Field Welds-Cut & Bevel-Std 1 Inch (25mm)	20 ea	7	402	-	-	140	-	543
	Field Butt Weld-API 5L-0.133 Wall-Std/Sch 40-1 Inch (25mm)	20 ea	14	814	4	-	284	-	1,102
	Pipe 16" Coated .375 Wall	240 lf	-	-	10,908	-	-	-	10,908
	Fitting Butt Weld-API-5L-Y42-Ell90-Std/Sch 30-16 Inch (400mm)	1 ea	-	-	942	-	-	-	942
	Fitting Butt Weld-API-5L-Y42-Ell45-Std/Sch 30-16 Inch (400mm)	2 ea	-	-	1,500	-	-	-	1,500
	Fitting Butt Weld-API-5L-Y42-Tee-Std/Sch 30-16 Inch (400mm)	1 ea	-	-	583	-	-	-	583
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 30 16 Inch (400mm)	205 lf	156	9,013	-	-	2,710	-	11,723
	Field Butt Weld-API 5L-0.375 Wall-Std/Sch 30-16 Inch (400mm)	15 ea	63	3,753	132	-	1,310	-	5,195
	PIPE, CS 12IN 375WL X42 PRTC BEV NTP API (SAP # 9312271)	80 lf	-	-	3,434	-	-	-	3,434
	ELBOW, CS 12IN LR45 375WL GR B BW NTP A2 (SAP # 9308373)	3 ea	-	-	580	-	-	-	580
	Pipeline Insulator	1 ea	-	-	9,461	-	-	-	9,461
	Pipe Erection-Handle Fittings-Metal-Std 12 Inch (300mm)	4 ea	5	275	-	-	116	-	391
	Pipe Erection-Straight Run-CS API 5L-Std 12 Inch (300mm)	65 lf	39	2,015	-	-	848	-	2,863
	Field Welds-Cut & Bevel-Std 12 Inch (300mm)	10 ea	27	1,434	-	-	557	-	1,990

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Estimate Detail

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Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	10 ea	35	1,858	70	-	721	-	2,649
	PIPE, CS 1-1/4IN 191WL GR B FBE PL NTP A (SAP # 9315839)	200 lf	-	-	2,912	-	-	-	2,912
	ELBOW, CS 1-1/4IN 90DEG GR B SW 3000PSIG (SAP # 9381643)	12 ea	-	-	121	-	-	-	121
	ELBOW, CS 1-1/4IN 45DEG GR B SW 3000PSIG (SAP # 9381644)	6 ea	-	-	65	-	-	-	65
	COUPLING, CS 1-1/4IN SW 3000PSIG A105 (SAP # 9385335)	8 ea	-	-	57	-	-	-	57
	COUPLING, CS 1-1/4IN SW 3000PSIG A105 (SAP # 9385335)	10 ea	-	-	72	-	-	-	72
	Field OLet Weld-API 5L-Cls 3000 (200 Bar)-XH/Sch 80-1-1/4 Inch (32mm)	10 ea	50	3,004	26	-	648	-	3,678
	Pipe Erection-Handle Fittings-Metal-Std 1-1/4 Inch (32mm)	47 ea	9	506	-	-	190	-	696
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 1-1/4 Inch (32mm)	200 lf	52	3,008	-	-	1,131	-	4,139
	Field Welds-Cut & Bevel-Std 1-1/4 Inch (32mm)	63 ea	23	1,406	-	-	303	-	1,710
	Field Butt Weld-API 5L-0.140 Wall-Std/Sch 40-1-1/4 Inch (32mm)	63 ea	46	2,753	16	-	593	-	3,361
	FBEpoxy Coating 40 mil-Factory-1-1/4 Inch (32mm)	200 lf	-	-	500	-	-	-	500
	FBEpoxy Coating 40 mil-Field Weld Application-1-1/4 Inch (32mm)	63 ea	32	1,822	52	-	685	-	2,559
	PIPE, CS 8IN 322WL GR B BARE BEV NTP API (SAP # 9312324)	20 lf	-	-	435	-	-	-	435
	GASKET, RING 8IN DIAx1/16IN THK 150LB (SAP # 9321387)	5 ea	-	-	20	-	-	-	20
	REDUCER, CS 8INx6IN 322x280WL GR B BW CO (SAP # 9315715)	1 ea	-	-	20	-	-	-	20
	TEE, WLD 8INx8INx8IN IPS STL (SAP # 9315885)	1 ea	-	-	91	-	-	-	91
	REDUCER, CS 12INx8IN 250x219WL GR B BW C (SAP # 9315717)	1 ea	-	-	169	-	-	-	169
	CAP, CS 8IN BW WPB 322WL NTP B16.9 A234 (SAP # 9312093)	1 ea	-	-	42	-	-	-	42
	FLANGE, RF WN CS 8IN CL150 GR II NTP A10 (SAP # 9316470)	4 ea	-	-	157	-	-	-	157
	FLANGE, RF WN CS 6IN CL150 GR II NTP A10 (SAP # 9315580)	1 ea	-	-	24	-	-	-	24

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Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Stud Bolts	12 ea	11	609	89	-	229	-	927
	Pipe Erection-Handle Fittings-Metal-Std 8 Inch (200mm)	7 ea	6	355	-	-	133	-	489
	Rubber Boot	1 ea	-	-	24	-	-	-	24
	Rain Cap	1 ea	-	-	333	-	-	-	333
	Valve, Ball, 8" Weld End 150#	1 ea	-	-	5,750	-	-	-	5,750
	Relief Valve 6x8 Flow Safe	1 ea	-	-	12,206	-	-	-	12,206
	Pipe Erection-Handle Valves-Metal-Cls 150 (PN20) 8 Inch (200mm)	8 ea	25	1,435	-	-	539	-	1,974
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 8 Inch (200mm)	10 lf	3	197	-	-	74	-	271
	Field Welds-Cut & Bevel-Std 8 Inch (200mm)	26 ea	46	2,731	-	-	589	-	3,320
	Field Butt Weld-API 5L-0.322 Wall-Std/Sch 40-8 Inch (200mm)	26 ea	54	3,237	99	-	698	-	4,033
	GASKET, RING 8IN DIAx1/16IN THK 150LB (SAP # 9321387)	5 ea	-	-	20	-	-	-	20
	FLANGE, RF WN CS 6IN CL150 GR II NTP A10 (SAP # 9315580)	1 ea	-	-	24	-	-	-	24
	Pipe Erection-Handle Valves-Metal-Cls 150 (PN20) 8 Inch (200mm)	8 ea	25	1,435	-	-	539	-	1,974
	Stud Bolts	12 ea	11	609	89	-	229	-	927
	Pipe Erection-Handle Fittings-Metal-Std 8 Inch (200mm)	7 ea	6	355	-	-	133	-	489
	REDUCER, CS 12INx8IN 250x219WL GR B BW C (SAP # 9315717)	1 ea	-	-	169	-	-	-	169
	TEE, WLD 8INx8INx8IN IPS STL (SAP # 9315885)	1 ea	-	-	91	-	-	-	91
	PIPE, CS 8IN 322WL GR B BARE BEV NTP API (SAP # 9312324)	20 lf	-	-	435	-	-	-	435
	Rubber Boot	1 ea	-	-	24	-	-	-	24
	REDUCER, CS 8INx6IN 322x280WL GR B BW CO (SAP # 9315715)	1 ea	-	-	20	-	-	-	20
	CAP, CS 8IN BW WPB 322WL NTP B16.9 A234 (SAP # 9312093)	1 ea	-	-	42	-	-	-	42
	FLANGE, RF WN CS 8IN CL150 GR II NTP A10 (SAP # 9316470)	4 ea	-	-	157	-	-	-	157
	Rain Cap	1 ea	-	-	333	-	-	-	333
	Valve, Ball, 8" Weld End 150#	1 ea	-	-	5,750	-	-	-	5,750
	Relief Valve 6x8 Flow Safe	1 ea	-	-	12,206	-	-	-	12,206
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 8 Inch (200mm)	10 lf	3	197	-	-	74	-	271

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Estimate Detail

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Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Field Welds-Cut & Bevel-Std 8 Inch (200mm)	26 ea	46	2,731	-	-	954	-	3,685
	Field Butt Weld-API 5L-0.322 Wall-Std/Sch 40-8 Inch (200mm)	26 ea	54	3,237	99	-	1,130	-	4,466
	PIPE, CS 2IN 154WL GR B BARE BEV NTP API (SAP # 9312351)	20 lf	-	-	75	-	-	-	75
	UNION, INSUL BLK MI THD 2IN IPS (SAP # 9315856)	2 ea	-	-	30	-	-	-	30
	2 x 10 Sockolet	2 ea	-	-	27	-	-	-	27
	1/2" Threadolet	2 ea	-	-	61	-	-	-	61
	1/2" Plug	2 ea	-	-	30	-	-	-	30
	Pipe Erection-Handle Fittings-Metal-Std 2 Inch (50mm)	8 ea	2	105	-	-	39	-	145
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 2 Inch (50mm)	20 lf	5	266	-	-	100	-	366
	Field Welds-Cut & Bevel-Std 2 Inch (50mm)	18 ea	8	489	-	-	171	-	660
	Field Butt Weld-API 5L-0.154 Wall-Std/Sch 40-2 Inch (50mm)	18 ea	15	905	7	-	316	-	1,228
	PIPE, CS 6IN 280WL GR B BARE BEV NTP API (SAP # 9312325)	10 lf	-	-	150	-	-	-	150
	16 x 12 Reducer	1 ea	-	-	671	-	-	-	671
	12 x 6 Reducing Tee	2 ea	-	-	505	-	-	-	505
	PIPE, CS 12IN 375WL X42 BARE BEV NTP API (SAP # 9312322)	6 lf	-	-	288	-	-	-	288
	TEE, WLD 12INx12INx8IN IPS STL (SAP # 9315877)	2 ea	-	-	1,137	-	-	-	1,137
	CAP, CS 12IN BW WPB 375WL NTP B16.9 A234 (SAP # 9312092)	2 ea	-	-	190	-	-	-	190
	FLANGE, RF WN CS 8IN CL150 GR II NTP A10 (SAP # 9316470)	12 ea	-	-	471	-	-	-	471
	REDUCER, CS 8INx6IN 322x280WL GR B BW CO (SAP # 9315715)	2 ea	-	-	41	-	-	-	41
	Bleed Rings	2 ea	3	147	277	-	61	-	486
	Pipe Erection-Handle Fittings-Metal-Std 6 Inch (150mm)	7 ea	5	238	-	-	99	-	337
	Valve, Ball, 8" Weld End 150#	2 ea	-	-	11,500	-	-	-	11,500
	6 " Mooney Regulator FG-44-50	1 ea	-	-	5,216	-	-	-	5,216
	6" Tee Strainer	1 ea	-	-	3,715	-	-	-	3,715
	6" Plug Valve	1 ea	-	-	4,752	-	-	-	4,752
	Valve, Ball 6" Weld End 150#	1 ea	-	-	3,860	-	-	-	3,860
	Pipe Erection-Handle Valves-Metal-Cls 150 (PN20) 6 Inch (150mm)	5 ea	10	599	-	-	225	-	824

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Estimate Detail

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Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 6 Inch (150mm)	20 lf	6	347	-	-	130	-	478
	Field Welds-Cut & Bevel-Std 6 Inch (150mm)	30 ea	39	2,338	-	-	816	-	3,154
	Field Butt Weld-API 5L-0.280 Wall-Std/Sch 40-6 Inch (150mm)	30 ea	47	2,801	72	-	978	-	3,851
PV-	**VALVES ONLY**		**281**	**16,646**	**43,827**	**-**	**5,638**	**-**	**66,110**
PV201	**6" Bypass V83**		**281**	**16,646**	**43,827**	**-**	**5,638**	**-**	**66,110**
	Valve, Ball, 6" Weld End 150#	1 ea	-	-	6,532	-	-	-	6,532
	BOX, RDWY PLSTC 8-3/4 ID BASE 5-1/2 RISE (SAP # 9315772)	2 ea	-	-	98	-	-	-	98
	BOX, RDWY 12IN SQ COV CI GAS DRIP (SAP # 9312290)	2 ea	-	-	745	-	-	-	745
	BOX, VALVE 12IN LKG COV MKD GAS (SAP # 9307586)	1 ea	-	-	256	-	-	-	256
	Pipe Erection-Handle Valves-Metal-Cls 150 (PN20) 6 Inch (150mm)	4 ea	8	479	-	-	180	-	659
	Field Welds-Cut & Bevel-Std 6 Inch (150mm)	7 ea	9	545	-	-	190	-	736
	Field Butt Weld-CS A53/A106-Std/Sch 40 6 Inch (150mm)	7 ea	15	913	22	-	319	-	1,254
	VALVE, PLUG CS 6IN 150PSIG BW 280WL EPOX (SAP # 9312203)	1 ea	-	-	4,841	-	-	-	4,841
	BOX, RDWY PLSTC 8-3/4 ID BASE 5-1/2 RISE (SAP # 9315772)	2 ea	-	-	98	-	-	-	98
	BOX, RDWY 12IN SQ COV CI GAS DRIP (SAP # 9312290)	1 ea	-	-	373	-	-	-	373
	Pipe Erection-Handle Valves-Metal-Cls 150 (PN20) 6 Inch (150mm)	4 ea	8	479	-	-	180	-	659
	Field Welds-Cut & Bevel-Std 6 Inch (150mm)	4 ea	5	312	-	-	109	-	421
	Field Butt Weld-CS A53/A106-Std/Sch 40 6 Inch (150mm)	4 ea	9	522	13	-	182	-	717
	Valve, Ball, 16", Weld End 150	1 ea	-	-	15,937	-	-	-	15,937
	BOX, RDWY PLSTC 8-3/4 ID BASE 5-1/2 RISE (SAP # 9315772)	2 ea	-	-	98	-	-	-	98
	BOX, RDWY 12IN SQ COV CI GAS DRIP (SAP # 9312290)	2 ea	-	-	745	-	-	-	745
	BOX, VALVE 12IN LKG COV MKD GAS (SAP # 9307586)	1 ea	-	-	256	-	-	-	256
	Pipe Erection-Handle Valves-Metal-Cls 150 (PN20) 16 Inch (400mm)	6 ea	36	2,065	-	-	621	-	2,686
	Field Butt Weld-CS A53/A106-Std/Sch 30 16 Inch (400mm)	12 ea	77	4,632	139	-	1,618	-	6,389

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Estimate Detail

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Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Pipe Erection-Handle Valves-Metal-Cls 150 (PN20) 16 Inch (400mm)	6 ea	36	2,065	-	-	621	-	2,686
	Field Butt Weld-CS A53/A106-Std/Sch 30 16 Inch (400mm)	12 ea	77	4,632	139	-	1,618	-	6,389
	Valve, Ball, 12", Weld End 150	1 ea	-	-	12,437	-	-	-	12,437
	BOX, RDWY PLSTC 8-3/4 ID BASE 5-1/2 RISE (SAP # 9315772)	2 ea	-	-	98	-	-	-	98
	BOX, RDWY 12IN SQ COV CI GAS DRIP (SAP # 9312290)	2 ea	-	-	745	-	-	-	745
	BOX, VALVE 12IN LKG COV MKD GAS (SAP # 9307586)	1 ea	-	-	256	-	-	-	256
SCI	**CONTROL & INTEGRATION**		**96**	**4,681**	**15,382**	**-**	**1,050**	**-**	**21,113**
SCI RTU CAB FM-I	**I-RTU Cabinet Floor Mount**		**96**	**4,681**	**15,382**	**-**	**1,050**	**-**	**21,113**
	RTU Cabinet & RTU Components	1 ea	-	-	15,382	-	-	-	15,382
	RTU Cabinet Floor Mount - Labor-I-Crew: STA-IHC-1	1 ea	96	4,681	-	-	1,050	-	5,731
Z10	**GENERAL REQUIREMENTS**		**256**	**14,574**	**27,515**	**12,000**	**2,194**	**-**	**56,284**
Z1000-01	**Mobilization & Demobilization**		**64**	**3,702**	**-**	**-**	**1,392**	**-**	**5,094**
	Move Materials & Tools to Job Site	1 ls	32	1,851	-	-	696	-	2,547
	Move Materials & Tools off Job Site	1 ls	32	1,851	-	-	696	-	2,547
Z1000-05	**Basic Temporary Construction Facilities**		**30**	**1,567**	**21,491**	**-**	**652**	**-**	**23,711**
	Temporary Toilets (wk)	24 wk	-	-	12,000	-	-	-	12,000
	Temporary Fence (rent)	300 lf	30	1,567	2,291	-	652	-	4,511
	Dumpster Rental	24 wk	-	-	7,200	-	-	-	7,200
Z1000-10	**Temporary Construction Facilities**		**162**	**9,304**	**6,024**	**12,000**	**150**	**-**	**27,479**
	Hay bales (lf)	600 lf	12	627	1,100	-	-	-	1,727
	Jersey Barriers	300 lf	-	-	3,666	-	-	-	3,666
	First Aid	1 ls	-	-	122	-	-	-	122
	Safety Equipment	1 ls	-	-	917	-	-	-	917
	Water Jugs	3 ea	-	-	220	-	-	-	220
	Safety Meeting Time	1,000 ea	150	8,678	-	-	150	-	8,828
	Storage Trailers	24 wk	-	-	-	12,000	-	-	12,000
	Total		**23,704**	**1,317,756**	**1,126,976**	**3,653,466**	**4,197,476**	**495,556**	**10,791,231**

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Material Analysis

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Material ID	Description	Quantity	Unit Price ($/Unit)	Amount ($)
01 52 16.00.A1005	First Aid	1 ls	122.20	122
01 52 19.00.A1010	Temporary Toilets (wk)	24 wk	500.00	12,000
01 54 04.00.A1005	Safety Equipment	1 ls	916.50	917
01 54 32.00.A1105	Water Jugs	3 ea	73.32	220
01 55 26.00.A1010	Jersey Barriers	300 lf	12.22	3,666
01 56 26.00.A1005	Temporary Fence (rent)	300 lf	7.64	2,291
01 57 13.00.A1005	Hay bales (lf)	600 lf	1.83	1,100
01 57 13.00.A1015	Silt Fence	5,190 lf	10.54	54,703
01 74 19.00.A1005	Dumpster Rental	24 wk	300.00	7,200
E03-05-00.20.XM1005	Demolition-Road Paving	156 sy	2.42	376
E030202H	Concrete Forms Pad (incl Ties and Bracing)	168 sf	1.31	220
E03 11 13.00C1005	Concrete Forms Strip, Coat, Store	168 sf	0.07	12
E030012	Concrete Rebar Grade 60 (415MPa) Fabricated incl Accessories #3 to #7 (10M to 22M)	1 tn	1,903.81	1,104
E03-31-00.00.A1035	Concrete Plant Mixed and Delivered 6000 psi (40 Mpa)	12 cy	261.68	3,054
E03 39 00.00A1005	Spray Curing Compound	315 sf	0.01	3
E03 48 13.00A1005	Bollards	21 ea	250.00	5,250
E05-05-23.05.A1210	Anchor Bolt 12x4 inch (300x100mm) - 1 inch (25mm) Dia - (Incl. Nuts, Jam Nuts, washers)	288 ea	11.18	3,218
26420000A1145	Cathodic Protection - Conductive Backfill	108 cf	10.66	1,151
26420000A1150	Cathodic Protection - Test Station (incl terminations)	1 ea	149.08	149
26420000A1160	Cathodic Protection - Install Anode (Incl Cable / Excl excavation)	36 ea	7.46	268
26420000A1165	Cathodic Protection - Weld Wire to Pipe	36 ea	7.46	268
26 05 33.21.A1030	Conduit Run with Couplings, Bends, Adapters, Etc Plastic Coated Steel 2 inch (53mm)	440 lf	26.00	11,440
E31-23-23.15.XM1030	Utility Backfill/Compact	6,043 cy	11.87	71,699
E32 12 16.00A1010	Asphalt Paving 6 inch (150mm)	2,500 sf	5.39	13,480
E32 15 00.00A1010	12 (16 X 50) temporary construction entrances	8,000 sf	1.08	8,672
E32 15 00.00A1010	Crushed Stone for Cabinets	270 sf	0.42	114
E32 15 00.00A1010	Runner Crush Driveway 25 x 35	875 sf	0.42	371
E32-90-00.21.XM1010	Hydoseeding Drill Pits	3,600 sf	0.10	360
E32-90-00.21.XM1010	Hydroseeding 8206 x 4 ft	32,824 sf	0.10	3,282
CI RTU CAB FM	RTU Cabinet & RTU Components	1 ea	15,382.00	15,382
E5000494800000000	Trench Breakers	12 ea	530.00	6,360
E5000494800000000	Water Bars	13 ea	130.00	1,690
26420000A1020	Cathodic Protection Anode - Magnesium - 17 lb	32 ea	68.62	2,196
26420000A1105	Cathodic Protection - Cable HMWPE - #10	65 lf	0.56	36
26420000A1130	Cathodic Protection - Cable HMWPE - #1	160 lf	3.52	563
534CW0001K	Bleed Rings	2 ea	138.60	277
534CW0001L	Stud Bolts	24 ea	7.45	179
E51032116010006Y4	Sockolet 1-1-1/2 3000#	7 ea	56.06	392
E5103510201000600	Field Butt Weld-API 5L-0.133 Wall-Std/Sch 40-1 Inch (25mm)	70 ea	0.18	13
9315839	PIPE, CS 1-1/4IN 191WL GR B FBE PL NTP A (SAP # 9315839)	200 lf	14.56	2,912

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Material ID	Description	Quantity	Unit Price ($/Unit)	Amount ($)
E5103510201000700	Field Butt Weld-API 5L-0.140 Wall-Std/Sch 40-1-1/4 Inch (32mm)	63 ea	0.25	16
51030756L02027200	Field OLet Weld-API 5L-Cls 3000 (200 Bar)-XH/Sch 80-1-1/4 Inch (32mm)	10 ea	2.64	26
9312352	PIPE, CS 1-1/2IN 145WL GR B BARE PL NTP (SAP # 9312352)	20 lf	7.05	141
E51032111010009Y4	2 x 10 Sockolet	2 ea	13.38	27
E51032114010009Y4	1/2" Threadolet	2 ea	30.30	61
E51032116010009Y4	1/2" Plug	2 ea	15.15	30
9312351	PIPE, CS 2IN 154WL GR B BARE BEV NTP API (SAP # 9312351)	20 lf	3.76	75
9312351	PIPE, CS 2IN 154WL GR B BARE BEV NTP API (SAP # 9312351)	80 lf	3.76	301
E5103510201000900	Field Butt Weld-API 5L-0.154 Wall-Std/Sch 40-2 Inch (50mm)	18 ea	0.40	7
9312325	PIPE, CS 6IN 280WL GR B BARE BEV NTP API (SAP # 9312325)	10 lf	15.02	150
9312233	PIPE, CS 6IN 280WL GR B PRTC BEV NTP API (SAP # 9312233)	160 lf	16.12	2,579
E51032111010015Y4	12 x 6 Reducing Tee	2 ea	252.50	505
E51032112010015Y4	16 x 12 Reducer	1 ea	670.50	671
E51032116010015Y4	Tee, Reducing 12 X 6	1 ea	414.00	414
E51032117010015Y4	Tee, Reducing 16 X 6	1 ea	624.00	624
E5103510201001500	Field Butt Weld-API 5L-0.280 Wall-Std/Sch 40-6 Inch (150mm)	42 ea	2.39	100
9312324	PIPE, CS 8IN 322WL GR B BARE BEV NTP API (SAP # 9312324)	40 lf	21.77	871
E5103510201001600	Field Butt Weld-API 5L-0.322 Wall-Std/Sch 40-8 Inch (200mm)	52 ea	3.80	198
E51031002010018E5	PIPE, 12" CS, FBE, .375 w.t API 5l X42	8,206 lf	35.11	288,113
E51031002010018E5	PIPE, 12" CS, POWERCRETE, .375 w.t API 5l X42	6,164 lf	49.31	303,947
9312322	PIPE, CS 12IN 375WL X42 BARE BEV NTP API (SAP # 9312322)	6 lf	47.94	288
9312271	PIPE, CS 12IN 375WL X42 PRTC BEV NTP API (SAP # 9312271)	80 lf	42.93	3,434
E51032111010018Y5	ELBOW, 12", 45 DEG,SEGMENTABLE, WELD. .375 W.T	19 ea	649.00	12,331
E51032112010018Y5	ELBOW, 12", 90 DEG,SEGMENTABLE, WELD. .375 W.T	5 ea	859.00	4,295
E51032114010018Y5	Pipeline Insulator	1 ea	9,460.75	9,461
E51032117010018Y4	Pipeline Insulator	1 ea	9,460.75	9,461
E51032117010018Y5	CAP, 12", WELD,.375	1 ea	237.00	237
E5103510201001800	Field Butt Weld-API 5L-0.375 Wall-Std-12 Inch (300mm)	440 ea	7.04	3,096
E51031002010020E4	Pipe 16" Coated .375 Wall	240 lf	45.45	10,908
E51032111010020Y4	Fitting Butt Weld-API-5L-Y42-Ell45-Std/Sch 30-16 Inch (400mm)	2 ea	750.00	1,500
E51032112010020Y4	Fitting Butt Weld-API-5L-Y42-Ell90-Std/Sch 30-16 Inch (400mm)	1 ea	942.00	942
E51032114010020Y4	Fitting Butt Weld-API-5L-Y42-Tee-Std/Sch 30-16 Inch (400mm)	1 ea	583.00	583
E5103510201002000	Field Butt Weld-API 5L-0.375 Wall-Std/Sch 30-16 Inch (400mm)	15 ea	8.83	132
9312236	PIPE, CS 1IN 133WL GR B PRTC PL NTP 21FT (SAP # 9312236)	115 lf	13.71	1,577
9315524	ELBOW, CS 1IN 90DEG 133WL GR B SW 3000PS (SAP # 9315524)	11 ea	3.83	42

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Material Analysis

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Material ID	Description	Quantity	Unit Price ($/Unit)	Amount ($)
9315745	COUPLING, HALF CS 1IN THD 3000PSIG A105 (SAP # 9315745)	1 ea	1.41	1
9385335	COUPLING, CS 1-1/4IN SW 3000PSIG A105 (SAP # 9385335)	18 ea	7.18	129
9381644	ELBOW, CS 1-1/4IN 45DEG GR B SW 3000PSIG (SAP # 9381644)	6 ea	10.87	65
9381643	ELBOW, CS 1-1/4IN 90DEG GR B SW 3000PSIG (SAP # 9381643)	12 ea	10.05	121
9314880	CAP, CS 6IN COMP LINE VENT BLT RESTRAINT (SAP # 9314880)	2 ea	241.16	482
9315392	ELBOW, CS 6IN LR45 280WL GR B BW NTP A23 (SAP # 9315392)	2 ea	25.02	50
9315528	ELBOW, CS 6IN LR90 280WL GR B BW NTP A23 (SAP # 9315528)	1 ea	53.26	53
9315580	FLANGE, RF WN CS 6IN CL150 GR II NTP A10 (SAP # 9315580)	2 ea	23.97	48
E5104510201001500	Field Butt Weld-CS A53/A106-Std/Sch 40 6 Inch (150mm)	11 ea	3.13	34
9312093	CAP, CS 8IN BW WPB 322WL NTP B16.9 A234 (SAP # 9312093)	2 ea	41.77	84
9315715	REDUCER, CS 8INx6IN 322x280WL GR B BW CO (SAP # 9315715)	4 ea	20.44	82
9315885	TEE, WLD 8INx8INx8IN IPS STL (SAP # 9315885)	2 ea	91.00	182
9316470	FLANGE, RF WN CS 8IN CL150 GR II NTP A10 (SAP # 9316470)	20 ea	39.27	785
9312092	CAP, CS 12IN BW WPB 375WL NTP B16.9 A234 (SAP # 9312092)	2 ea	94.88	190
9315212	CAP, CS 12IN COMP LINE VENT BLT RESTRAIN (SAP # 9315212)	1 ea	456.05	456
9308373	ELBOW, CS 12IN LR45 375WL GR B BW NTP A2 (SAP # 9308373)	3 ea	193.35	580
9315717	REDUCER, CS 12INx8IN 250x219WL GR B BW C (SAP # 9315717)	2 ea	168.80	338
9315877	TEE, WLD 12INx12INx8IN IPS STL (SAP # 9315877)	2 ea	568.36	1,137
9315494	TEE, WLD LINE STOPPER FTG 12IN IPS (SAP # 9315494)	1 ea	4,085.75	4,086
9307775	CAP, CS 16IN COMP 1IN VENT BLT NON-RESTR (SAP # 9307775)	1 ea	393.93	394
E5104510201002000	Field Butt Weld-CS A53/A106-Std/Sch 30 16 Inch (400mm)	24 ea	11.56	277
9315856	UNION, INSUL BLK MI THD 2IN IPS (SAP # 9315856)	2 ea	14.99	30
727KZ7326	Valve, Ball, 6" Weld End 150#	1 ea	6,532.00	6,532
727KZ7326	Valve, Ball, 8" Weld End 150#	2 ea	5,750.00	11,500
027CN1238	6" Tee Strainer	1 ea	3,715.00	3,715
E5301613300621500	6" Plug Valve	1 ea	4,752.00	4,752
727KZ8758	6 " Mooney Regulator FG-44-50	1 ea	5,216.00	5,216
E5301613600621500	Valve, Ball 6" Weld End 150#	1 ea	3,860.00	3,860
9312203	VALVE, PLUG CS 6IN 150PSIG BW 280WL EPOX (SAP # 9312203)	1 ea	4,841.00	4,841
727KZ7327	Rubber Boot	2 ea	24.00	48
E5301613300621600	Valve, Ball, 8" Weld End 150#	2 ea	5,750.00	11,500
727KZ8759	Rain Cap	2 ea	333.45	667
E5301613700621600	Relief Valve 6x8 Flow Safe	2 ea	12,206.00	24,412
E5301613700651800	VALVE, 12" PLUG VALVE , BUTT WELD	2 ea	11,800.05	23,600

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Material Analysis

C082363-RTE 146 Rexford-4.3

Material ID	Description	Quantity	Unit Price ($/Unit)	Amount ($)
E5301613500622000	Valve, Ball, 12", Weld End 150	1 ea	12,437.00	12,437
E5301613500622000	Valve, Ball, 16", Weld End 150	1 ea	15,937.25	15,937
9312256	VALVE, PLUG IRON 1IN 175PSIG THD (SAP # 9312256)	11 ea	14.67	161
E5900008801000700	FBEpoxy Coating 40 mil-Factory-1-1/4 Inch (32mm)	200 lf	2.50	500
E59000088B1000700	FBEpoxy Coating 40 mil-Field Weld Application-1-1/4 Inch (32mm)	63 ea	0.83	52
9311183	1' THREADOLET	8 ea	12.69	102
9311183	1-1/2 3000# SOCKOLET	4 ea	88.95	356
9311183	1-1/4 TEE SERVICE MUELLER CURB VALVE	4 ea	95.62	382
9311183	2' BALL VALVE	6 ea	92.75	557
9311183	2 X4 NIPPLE	6 ea	21.75	131
9311183	2" PLUG VALVE	6 ea	58.95	354
9311183	2" THREADOLET	14 ea	22.92	321
9311183	ANODE, MAG BAG 17LB 3.5INx25IN (SAP # 9311183)	4 ea	68.62	274
9311183	BARRIER BOARD	6 ea	39.50	237
9311183	CAP, 12", WELD,.375	13 ea	237.00	3,081
9311183	EXTRA ELBOW, 12", 45 DEG,SEGMENTABLE, WELD. .375 W.T	7 ea	649.00	4,543
9311183	EXTRA ELBOW, 12", 90DEG,SEGMENTABLE, WELD. .375 W.T	2 ea	859.00	1,718
9311183	Extra PIPE, 12" CS, FBE, .375 w.t API 5l X42	200 lf	35.11	7,022
9311183	Extra PIPE, 12" CS, POWERCRETE, .375 w.t API 5l X42	200 ea	49.31	9,862
9311183	Material Allowance for GRS	1 ls	5,000.00	5,000
9311183	Material Allowance for Pipe	1 ls	5,000.00	5,000
9312290	BOX, RDWY 12IN SQ COV CI GAS DRIP (SAP # 9312290)	11 ea	372.64	4,099
9315772	BOX, RDWY PLSTC 8-3/4 ID BASE 5-1/2 RISE (SAP # 9315772)	14 ea	48.93	685
9307586	BOX, VALVE 12IN LKG COV MKD GAS (SAP # 9307586)	3 ea	255.95	768
9321387	GASKET, RING 8IN DIAx1/16IN THK 150LB (SAP # 9321387)	10 ea	4.01	40
9312342	APX Cabinet for Regulator	1 ea	15,357.00	15,357
9312342	APX Cabinets for Relief	2 ea	15,357.00	30,714
9312342	MARKER, PPLN Y TEST STA 3-1/2INx84IN L (SAP # 9312342)	8 ea	35.25	282
9315459	NUT, ADAPTR VALVE OPR 2IN SQ (SAP # 9315459)	2 ea	23.95	48
9315631	CAUTION TAPE	16 roll	35.22	564
9315631	PADDING, PIPE 3/8INx60INx140FT PLSTC (SAP # 9315631)	1 roll	836.06	836
9315631	PADDING, PIPE 3/8INx60INx140FT PLSTC (SAP # 9315631)	1 roll	836.06	836
9315631	WAX TAPE	1 roll	35.22	35
9312287	PLUG, THD CI BLK 1IN IPS CORED SQ HEAD (SAP # 9312287)	12 ea	1.08	13
9310185	TEE, SVCE VALVE 1-1/4IN WLD OUT (SAP # 9310185)	7 ea	81.68	572
	Total			**1,126,976**

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Labor Analysis

C082363-RTE 146 Rexford-4.3

			CAP		OPE		COR		Total	
ID	Description	Rate Table	Hours	Amt ($)	Hours	Amt ($)	Hours	Amt ($)	Hours	Amt ($)
	Labor - Craft		**22,751**	**1,265,568**	**-**	**-**	**-**	**-**	**22,751**	**1,265,568**
81090670	Technician	L-GEN-50hr	408	19,912	-	-	-	-	**408**	**19,912**
81257000	Foreman	L-GEN-50hr	3,043	183,697	-	-	-	-	**3,043**	**183,697**
81257223	Welder	L-GEN-50hr	3,615	215,158	-	-	-	-	**3,615**	**215,158**
81282028	Lead Mechanic	L-GEN-50hr	2,848	168,045	-	-	-	-	**2,848**	**168,045**
81282590	Mechanic	L-GEN-50hr	8,050	440,643	-	-	-	-	**8,050**	**440,643**
81282591	Operator Excavator	L-GEN-50hr	3,043	158,147	-	-	-	-	**3,043**	**158,147**
81282723	Operator Engineer	L-GEN-50hr	849	38,642	-	-	-	-	**849**	**38,642**
82001499	Senior Designer	L-MGMT Gas UNY	184	8,226	-	-	-	-	**184**	**8,226**
82001647	Real Estate Representive	L-MGMT Gas UNY	232	10,711	-	-	-	-	**232**	**10,711**
82001711	Senior Surveyor	L-MGMT Gas UNY	384	17,706	-	-	-	-	**384**	**17,706**
81110088 JE	Util Worker 2/C-JE	L_ST_2018_12_70hr wk	58	2,793	-	-	-	-	**58**	**2,793**
81110089 AE	Util Worker 3/C-AE	L_ST_2018_12_70hr wk	19	852	-	-	-	-	**19**	**852**
81130011 EF	Util Worker 1/C-EF	L_ST_2018_12_70hr wk	19	1,036	-	-	-	-	**19**	**1,036**
	Labor - Management		**953**	**52,188**	**-**	**-**	**-**	**-**	**953**	**52,188**
80000745	Lead Project Manager	L-MGMT Gas UNY	590	34,439	-	-	-	-	**590**	**34,439**
82000353	Estimator	L-MGMT Gas UNY	66	3,072	-	-	-	-	**66**	**3,072**
82000373	Lead Supv Operations / Lead Supervisor	L-MGMT Gas UNY	40	2,135	-	-	-	-	**40**	**2,135**
82000393	Senior Counsel	L-MGMT Gas UNY	14	1,337	-	-	-	-	**14**	**1,337**
82001477	Senior Engineer	L-MGMT Gas UNY	134	6,037	-	-	-	-	**134**	**6,037**
82001647	Real Estate Representive	L-MGMT Gas UNY	17	784	-	-	-	-	**17**	**784**
82001826	Senior Gas Sys Operator	L-MGMT Gas UNY	2	98	-	-	-	-	**2**	**98**
82001946	Senior Quality Inspector	L-MGMT Gas UNY	60	2,707	-	-	-	-	**60**	**2,707**
82002201	Lead Scientist / Environmental Engineer	L-MGMT Gas UNY	31	1,581	-	-	-	-	**31**	**1,581**
	Total		**23,704**	**1,317,756**	**-**	**-**	**-**	**-**	**23,704**	**1,317,756**

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Equipment Analysis

C082363-RTE 146 Rexford-4.3

ID	Description	Hours	Unit Price ($/HR)	Amount ($)
11351	Pickup Truck	14	8.70	119
18903	Utility Trailer	14	3.54	49
20820	Boom Lift	14	23.98	329
25731	Skid Steer	14	10.47	144
26153	Lull	14	15.02	206
26902	Compressor	14	8.88	122
e-backhoe	Backhoe	46		
GEN	Generator	14	6.00	82
gen-d-drill rig	gen-Drill Rig	1,697	1,396.77	2,370,917
gen-e-backhoe	gen-Backhoe	3,626	20.30	73,622
gen-e-excavator	gen-Excavator	46	20.91	970
gen-t-crew truck	gen-Compressor Truck	3,603	21.88	78,808
gen-t-dump truck	gen-Dump Truck	3,423	20.50	70,186
gen-t-pick up	gen-Pick up	1	8.70	5
gen-t-rack truck	gen-Rack Truck	5,323	286.06	1,522,809
gen-t-vacuum truck	gen-Vacuum Truck	46	76.93	3,570
gen-t-van	gen-Van	103	6.68	690
gen-t-welding truck	gen-Welding Truck	3,533	20.37	71,969
t-pick up 4x4	Pick up 4X4	146	8.20	1,200
	Total	**21,691**		**4,195,796**

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PURPOSE

This form documents the assumptions and any other items that went into creating the estimate. To ensure consistency in all the published estimates, the items that influenced the final estimate are listed here and then included in the published Estimate PDF file.

1.0 ESTIMATE DESCRIPTION

1.1	Project Funding # :	C082726
1.2	Project Work Order #:	10028693132, 90000206305 (Land)
1.3	Estimate Name:	C082726-RTE 146 Altamont (Rev 1)-4.3
1.4	Estimate Completion Date:	08/31/2020
1.5	Estimate Stage:	4.3

2.0 SCOPE OF WORK

The Route 146 Altamont reinforcement project located in Altamont, NY ensures the Albany 45 PSIG gas distribution system maintains a threshold minimum design pressure of 10 PSI during design day operations. The Synergy Model using the forecasted load growth projections in the area predict more than 1,100 customers may be impacted by below minimum gas pressures.

The project consists of the following major components:

- Installation of 7,965' of 8" plastic main.
- Installation of 2,465' of 8" Powercrete coated steel main
- Installation of 2,397' of 12" plastic gas main
- Retirement of 1,075' of 4" plastic gas main
- Retirement of 2,582'of 12" steel gas main
- Retirement of 122' of 6" Steel gas main
- Relay, reconnect or insert 24 gas service lines

3.0 CLARIFICATIONS

3.1 The estimate is based on the Gas Distribution Scoping Document dated March 23rd, 2020 and Profile Drawings State Route 146 dated 03/23/20 and Profile Drawings Western Ave drawings dated 04/06/2020.(Only Profile Pages 1 and 2)

3.2 AFUDC was calculated using a combined debt/equity rate of 6.10% which is based on the past 2-year average actual rate and an in-service date of 10/31/2022.

3.3 The estimate includes $1,160,149 spend to date as of 08/11/2020. ($869,168.06 work order 10028693132 and $290,981.30 Land work order 90000206305)

3.4 Work order 90000206305 was created for 26 Land Easements for $320,000.

3.5 $35,422 from work order 10028693359 will be transferred to work order 10028693132.

3.6 The project scope meets the NYS PSC complex project definition and will be candidate for the NYS PSC UNY Gas Estimating Performance Metric.

3.7 Civil, mechanical and restoration activities will be performed by a contractor awarded through a competitive bidding process.

3.8 Ten (10) percent of all welds will be tested using Non-Destructive Examination (NDE).

3.9 National Grid's overhead and burden rates used in this estimate were based on the May 2020 SAGE Templates.

3.10 Stock material pricing is based on SAGE Estimating database inventory items. Non-stock material costs were obtained from vendor quotes or actual costs from past projects.

3.11 The Means and Methods for construction includes both Horizontal Directional drilling (HDD) and Open Cut trench methods.

3.12 Work area protection plans includes two (2) flaggers for the entire duration of the project.

3.13 The project requires the completion of a SWPPP along with weekly inspections.

4.0 ASSUMPTIONS

4.1 The field construction activities are scheduled for 16 weeks in duration.
4.2 The project will be started and completed in Fiscal Year 2023.
4.3 The Contractor's weekly work hours consist of working six (6) days per week and 8 hours per day.
4.4 Crew productivity for the open trench portion of this project assumes 120 ft of gas main installed per day.
4.5 The total installed pipe length does not exceed 12,827 ft.
4.6 The open cut trench length does not exceed 5,510 ft of 8" PE and 2,397 ft of 12" PE main.
4.7 The soft surface trench excavation length will be 7,197 ft and hard surface trench excavation length will be 710 ft.
4.8 Seven (7) separate horizontal directional drill segments required. The total length of main installed by HDD will be 4,920 ft. (2455 ft of 8" PE, 2465 of 8" Steel)
4.9 Final road and site restoration activities consists of 400 square ft of concrete sidewalks, 2,210 square ft of asphalt roadway and 28,788 square feet of soft surface.
4.10 The wetlands and marshaling yards will require the placement of 820 mats.
4.11 There will be 2 separate main Tie-Ins consisting of 1 end of main 8" plastic squeeze off and 12" Steel Side-Out Fitting.
4.12 Two Full-Time Contractor Supervisors required during construction activities.
4.13 One Full-Time On-Site Safety Person required for the duration of the project.
4.14 National Grid will require a 3rd party Contractor (Kleinfelder) on site for additional oversight during the HDD activities for steel bore segments only.
4.15 Main installation outside the public right of way requires 26 individual private property easements required.
4.16 Work Area protection and traffic control costs for 16-week duration.
4.17 (2) Railroad Flaggers for 3 weeks in duration required during the railroad crossing activities.
4.18 A preliminary pressure test will be performed every 1500 ft and overall pressure test at the completion of the project.
4.19 24 services need to be tied-over. Assuming 2 services a day.

5.0 EXCLUSIONS

5.1 Permit stipulations requiring reduced day time or night time work hours.
5.2 Additional labor costs for working during the winter months.
5.3 Delay costs for the handling of any environmental hazardous spoils.
5.4 Delay costs for the productivity loses for major weather events.
5.5 Delay costs for contractor losses with unsuccessful HDD bores or consolidated rock being encountered.
5.6 National Grid internal policy change requiring a Certified Welding Inspector (CWI) be present for all welding activities.

6.0 RISK / CONTINGENCY

The risk-based contingency figures (P50/P80) presented in this estimate are intended to cover risks associated with the presented scope. Major scope changes are not included.

6.1 The estimate includes a contingency of 5%.

6.2 A risk meeting was held on 08/26/2020.
6.2.1 Risk Dollars P50 / EV - $715,344
6.2.2 Risk Dollars P80 / SC - $1,116,261

7.0 ESCALATION

Total Estimate (Direct + Indirect Costs)				
	CAPEX	OPEX	COR	Total
Estimate Value (CY 2020)	$ 9,654,988	$ -	$ 98,509	$ 9,753,497
Estimate Value Including Escalation (CY 2022)	$ 9,962,607	$ -	$ 102,856	$ 10,065,463
Estimate Value Including Escalation (CY 2023)	$ 10,121,574	$ -	$ 105,112	$ 10,226,686
Estimate Value Including Escalation (CY 2024)	$ 10,284,092	$ -	$ 107,425	$ 10,391,517

Escalation Percentage CY 2022	3.20%

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8.0 ESTIMATE HISTORY

8.1 Stage 4.2 Estimate
- 8.1.1 Date: 05/02/2019
- 8.1.2 Base Total: $5,472,949
- 8.1.3 P50 Total: N/A
- 8.1.4 P80 Total: N/A

8.2 Stage 4.3 Estimate
- 8.2.1 Date: 05/01/2020
- 8.2.2 Base Total: $13,281,935
- 8.2.3 P50 Total: $14,088,161
- 8.2.4 P80 Total: $14,488,339

8.3 Stage 4.3 (Rev 1) Estimate
- 8.3.1 Date: 08/31/2020
- 8.3.2 Base Total: $10,960,003
- 8.3.3 P50 Total: $11,675,347
- 8.3.4 P80 Total: $12,076,264

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Estimate Totals

C082726-RTE 146 Altamont (Rev1)-4.3

Utility	Gas	Proj Number	2017090681117	Est Number	
Proj Type	Gas Distribution	Funding Proj	C082726	Est Stage	4.3
Proj Lead	Hill, William	Work Order	10028693132 90000206305	Est Version	1
Estimator	Coppola, Brian	State	NY	Est Type	Complex
Company	5210 - Niagara Mohawk Power Corp	Fiscal Yr	2023	Last Update	8/31/2020 3:29:55 PM
Base Template	Gas - 5210 - NY - NIMO Gas - Oct 2019				

	CAP	OPE	COR	Total
Base Total	**10,336,548**	**-**	**101,549**	**10,438,097**
Base + Contingency Total	**10,853,375**	**-**	**106,626**	**10,960,002**
Base + Contingency + P50 Total				**11,675,346**
Base + Contingency + P80 Total				**12,076,263**

Prepared by: 08/31/202

Reviewed by:

Reviewed by: 09/03/202

Reviewed by: Paul A. Canna 09/03/202

Approved by: 09/03/2020

This estimate is valid until: 02/28/202

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Estimate Summary

C082726-RTE 146 Altamont (Rev1)-4.3

Utility	**Gas**	Proj Number	**2017090681117**	Est Number	
Proj Type	**Gas Distribution**	Funding Proj	**C082726**	Est Stage	**4.3**
Proj Lead	**Hill, William**	Work Order	**10028693132 90000206305**	Est Version	**1**
Estimator	**Coppola, Brian**	State	**NY**	Est Type	**Complex**
Company	**5210 - Niagara Mohawk Power Corp**	Fiscal Yr	**2023**	Last Update	**8/31/2020 3:29:55 PM**
Base Template	**Gas - 5210 - NY - NIMO Gas - Oct 2019**				

		CAP	OPE	COR	Total
Labor - Management		39,687	-	-	39,687
Labor - Craft		763,072	-	48,306	811,378
Material - Stock		128,764	-	-	128,764
Material - Non-stock		193,298	-	-	193,298
Subcontractor		2,329,463	-	-	2,329,463
Equipment		2,816,543	-	20,278	2,836,821
Other		958,461	-	-	958,461
Subtotal (by Category)		**7,229,288**	**-**	**68,583**	**7,297,872**
Material Tax	7.88%	25,378	-	-	25,378
Stores Material Handling	18.00%	25,004	-	-	25,004
Overhead - Management	71.40%	28,337	-	-	28,337
Overhead - Craft	61.95%	472,723	-	29,925	502,648
COD	25.00%	1,705,111	-	-	1,705,111
A&G	2.48%	169,147	-	-	169,147
AFUDC	-	361,085	-	-	361,085
Escalation	3.20%	320,475	-	3,040	323,515
Base Total		**10,336,548**	**-**	**101,549**	**10,438,097**
Contingency	5.00%	516,827	-	5,077	521,905
Base + Contingency Total		**10,853,375**	**-**	**106,626**	**10,960,002**
P50					715,344
Base + Contingency + P50 Total					**11,675,346**
P80					1,116,261
Base + Contingency + P80 Total					**12,076,263**

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Summary by Division

C082726-RTE 146 Altamont (Rev1)-4.3

Utility	**Gas**	Proj Number	**2017090681117**	Est Number	
Proj Type	**Gas Distribution**	Funding Proj	**C082726**	Est Stage	**4.3**
Proj Lead	**Hill, William**	Work Order	**10028693132 90000206305**	Est Version	**1**
Estimator	**Coppola, Brian**	State	**NY**	Est Type	**Complex**
Company	**5210 - Niagara Mohawk Power Corp**	Fiscal Yr	**2023**	Last Update	**8/31/2020 3:29:55 PM**
Base Template	**Gas - 5210 - NY - NIMO Gas - Oct 2019**				

	Lab Hrs	Labor	Material	Sub	Equip	Other	Total
01 - General Requirements	2,645	134,096	47,901	2,329,463	16,014	958,461	3,485,935
02 - Existing Conditions	1,183	61,611	-	-	25,816	-	87,427
03 - Concrete	21	1,099	573	-	457	-	2,129
31 - Earthwork	7,288	391,533	41,627	-	2,691,406	-	3,124,566
32 - Exterior Improvements	431	20,419	60,850	-	8,987	-	90,257
40 - Process Interconnections	4,644	242,306	14,750	-	94,140	-	351,196
51 -	-	-	1,829	-	-	-	1,829
52 -	-	-	116,399	-	-	-	116,399
53 -	-	-	11,800	-	-	-	11,800
90 -	-	-	26,333	-	-	-	26,333
Subtotal Cost (by Division)	**16,212**	**851,065**	**322,062**	**2,329,463**	**2,836,821**	**958,461**	**7,297,872**

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Estimate Detail

C082726-RTE 146 Altamont (Rev1)-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount (S)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	*** Unassigned**		**8,540**	**451,138**	**132,067**	**2,320,663**	**2,676,550**	**958,461**	**6,538,879**
	*** Unassigned**		**8,540**	**451,138**	**132,067**	**2,320,663**	**2,676,550**	**958,461**	**6,538,879**
	Contractor Fee	1 ls	-	-	-	886,550	-	-	886,550
	Contractor Safety Rep	1 ls	-	-	-	49,820	-	-	49,820
	Contractor PM	128 mh	-	-	-	10,880	-	-	10,880
	Performance and Payment Bonds (1 %)	1 ls	-	-	-	50,000	-	-	50,000
	Survey Consultant THEW (Actual)	1 ls	-	-	-	4,475	-	-	4,475
	Supervisor - Contractor Open Cut	16 wk	-	-	-	119,520	-	-	119,520
	Supervisor - Contractor Sky Testing (Actual)	1 ls	-	-	-	7,362	-	-	7,362
	Environmental Consultant TRC Remaining	1 ls	-	-	-	22,032	-	-	22,032
	Environmental Consultant TRC (Actual)	1 ls	-	-	-	26,745	-	-	26,745
	X-Ray	6 dy	-	-	-	7,560	-	-	7,560
	Travel & Expenses	1 ls	-	-	-	-	-	2,000	2,000
	Travel & Expenses (Actual)	1 ls	-	-	-	-	-	661	661
	NGrid Lead Engineer	60 mh	60	3,247	-	-	-	-	3,247
	NGrid Lead Engineer (Actual)	128 mh	128	6,927	-	-	-	-	6,927
	NGrid Engineer (Actual)	6 mh	6	256	-	-	-	-	256
	NGrid Lead Scientist / Environmetal Engineer (Actual)	4 mh	4	204	-	-	-	-	204
	NGrid Estimator	40 mh	40	1,862	-	-	-	-	1,862
	NGrid Designer	80 mh	80	3,586	-	-	-	-	3,586
	NGrid Designer (Actual)	332 mh	332	14,897	-	-	-	-	14,897
	Maps and Records	160 mh	160	7,173	-	-	-	-	7,173
	NGrid Senior Project Development	24 mh	24	1,402	-	-	-	-	1,402
	NGrid Senior Project Development (Actual)	31 mh	31	1,811	-	-	-	-	1,811
	NGrid Lead Project Manager	144 mh	144	8,412	-	-	-	-	8,412
	NGrid Lead Gas Sys Operator	1 mh	1	58	-	-	-	-	58
	NGrid Real Estate Representative Union	80 mh	80	3,689	-	-	-	-	3,689
	NGrid Real Estate Representative Union (Actual)	148 mh	148	6,838	-	-	-	-	6,838
	NGrid Senior Quality Inspector	48 mh	48	2,165	-	-	576	-	2,741
	NGrid Senior Surveyor	80 mh	80	3,689	-	-	-	-	3,689
	NGrid Senior Surveyor (Actual)	33 mh	33	1,499	-	-	-	-	1,499
	NGrid 3 Man I&R Crew	120 mh	120	5,859	-	-	1,440	-	7,299
	Environmental Consultant Aecom	1 ls	-	-	-	3,100	-	-	3,100
	Environmental Consultant Aecom (Actual)	1 ls	-	-	-	5,301	-	-	5,301

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Estimate Detail

C082726-RTE 146 Altamont (Rev1)-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount (S)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Dekatherm Locating (Actual)	1 ls	-	-	-	1,285	-	-	1,285
	Syracuse Utilites (Actual)	1 ls	-	-	-	7,150	-	-	7,150
	Northern Clearing (Actual)	1 ls	-	-	-	3,911	-	-	3,911
	Engineering & Design Fees JD Hair (Actual)	1 ls	-	-	-	19,795	-	-	19,795
	Work Order Transfers 10028693132 (Actual)	1 ls	-	-	-	-	-	623,633	623,633
	Easements	1 ls	-	-	-	-	-	25,000	25,000
	Easements (Actual)	1 ls	-	-	-	-	-	259,744	259,744
	Easements Locci's (Actual)	1 ls	-	-	-	-	-	3,000	3,000
	Real Estate Consultant Northeastern Land Service (Actual)	1 ls	-	-	-	3,422	-	-	3,422
	HDD MOB HDD 1 Railroad 8 "Steel	2 dy	64	3,520	-	-	12,800	-	16,320
	HDD DEMOB	2 dy	64	3,520	-	-	12,800	-	16,320
	HDD Pilot Holes	1,100 lf	528	29,040	-	-	422,400	-	451,440
	HDD Reaming	1,100 lf	211	11,616	-	-	168,960	-	180,576
	HDD Pipe Pull	1,100 lf	48	2,632	-	-	38,280	-	40,912
	HDD MOB HDD 2 to HDD 3 8" PE	1 dy	32	1,760	-	-	6,400	-	8,160
	HDD DEMOB	2 dy	64	3,520	-	-	12,800	-	16,320
	HDD Pilot Holes	605 lf	290	15,939	-	-	169,530	-	185,469
	HDD Reaming	605 lf	116	6,356	-	-	67,600	-	73,955
	HDD Pipe Pull	605 lf	48	2,645	-	-	28,137	-	30,782
	HDD MOB HDD 3 to HDD 4 8" PE	1 dy	32	1,760	-	-	6,400	-	8,160
	HDD DEMOB	1 dy	32	1,760	-	-	6,400	-	8,160
	HDD Pilot Holes	493 lf	236	12,988	-	-	138,146	-	151,134
	HDD Reaming	493 lf	94	5,179	-	-	55,085	-	60,264
	HDD Pipe Pull	493 lf	47	2,576	-	-	27,398	-	29,974
	HDD MOB HDD 4 to HDD 5 8" PE	1 dy	32	1,760	-	-	6,400	-	8,160
	HDD DEMOB	1 dy	32	1,760	-	-	6,400	-	8,160
	HDD Pilot Holes	557 lf	267	14,674	-	-	156,080	-	170,754
	HDD Reaming	557 lf	106	5,851	-	-	62,236	-	68,088
	HDD Pipe Pull	557 lf	47	2,604	-	-	27,697	-	30,301
	HDD MOB HDD 5 to Parking Area 8" PE	1 dy	32	1,760	-	-	6,400	-	8,160
	HDD DEMOB	1 dy	32	1,760	-	-	6,400	-	8,160
	HDD Pilot Holes	383 lf	183	10,090	-	-	107,322	-	117,412
	HDD Reaming	383 lf	73	4,023	-	-	42,795	-	46,818
	HDD Pipe Pull	383 lf	48	2,633	-	-	28,007	-	30,640
	HDD MOB HDD 6 Normans Kill 8" Steel	2 dy	64	3,520	-	-	12,800	-	16,320
	HDD DEMOB	2 dy	64	3,520	-	-	12,800	-	16,320

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Estimate Detail

C082726-RTE 146 Altamont (Rev1)-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	HDD Pilot Holes	1,365 lf	655	36,036	-	-	524,160	-	560,196
	HDD Reaming	1,365 lf	262	14,414	-	-	209,664	-	224,078
	HDD Pipe Pull	1,365 lf	49	2,703	-	-	39,312	-	42,015
	HDD MOB HDD 7 8" PE	1 dy	32	1,760	-	-	6,400	-	8,160
	HDD DEMOB	1 dy	32	1,760	-	-	6,400	-	8,160
	HDD Pilot Holes	417 lf	200	10,986	-	-	116,850	-	127,836
	HDD Reaming	417 lf	80	4,381	-	-	46,594	-	50,974
	HDD Pipe Pull	417 lf	46	2,523	-	-	26,834	-	29,357
	CAP, CS 12IN COMP LINE VENT BLT RESTRAIN (SAP # 9315212)	2 ea	-	-	912	-	-	-	912
	ELBOW, HDPE 12IN IPS 90DEG SDR13.5 BTFS (SAP # 9314429)	7 ea	-	-	2,096	-	-	-	2,096
	ELBOW, HDPE 12IN IPS 45DEG SDR13.5 BTFS (SAP # 9314428)	13 ea	-	-	3,913	-	-	-	3,913
	FITTING, TRNSN 12IPS ST 0.250IN WALL (SAP # 9314582)	1 ea	-	-	859	-	-	-	859
	FITTING, LINE STOPPER 12IN IPS SIDE OUT (SAP # 9314452)	1 ea	-	-	6,291	-	-	-	6,291
	TRACER WIRE, DIRECT BURY USE, COPPER, 12AWG, 7 STRAND, HMW-HDPE 30 MIL INSULATING JACKET, YELLOW - 500 FT SPOOL (SAP # 9334433)	2,397 lf	-	-	360	-	-	-	360
	ANODE, MAG BAG 17LB 3.5INx25IN (SAP # 9311183)	4 ea	-	-	274	-	-	-	274
	BOX, RDWY TEST 5IDx18 ABS CI COLLAR/COV (SAP # 9312291)	2 ea	-	-	52	-	-	-	52
	FITTING, SHORT STOPP WELD 12IN CTR BASE (SAP # 9312565)	1 ea	-	-	1,333	-	-	-	1,333
	SLEEVE, PROTECTIVE 2-1/2INx60IN L PVC (SAP # 9315380)	1 ea	-	-	5	-	-	-	5
	NUT, ADAPTR VALVE OPR 2IN SQ (SAP # 9315459)	2 ea	-	-	48	-	-	-	48
	VALVE, BALL HDPE 12IN IPS BTFS SDR13.5 F (SAP # 9307909)	1 ea	-	-	3,633	-	-	-	3,633
	VALVE, BALL HDPE 8IN IPS BTFS SDR13.5 FU (SAP # 9315189)	4 ea	-	-	3,004	-	-	-	3,004
	BOX, RDWY 6 IN IDx18 TOP 6-1/2INx30 BOT (SAP # 9315165)	4 ea	-	-	301	-	-	-	301
	TEE, EFT PE2408 2IN IPSx8IN SDL (SAP # 9314587)	1 ea	-	-	65	-	-	-	65
	TEE, TAPPING EFT HDPE 1IN CTSx8IN SDL (SAP # 9314603)	1 ea	-	-	26	-	-	-	26

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Estimate Detail

C082726-RTE 146 Altamont (Rev1)-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	CAP, HDPE 12IN IPS BTFS SDR13.5 (SAP # 9314605)	1 ea	-	-	227	-	-	-	227
	REDUCER, HDPE 12IN IPSx8IN IPS 945x639WL (SAP # 9314583)	1 ea	-	-	299	-	-	-	299
	TRACER WIRE, DIRECT BURY USE, COPPER, 12AWG, 7 STRAND, HMW-HDPE 30 MIL INSULATING JACKET, YELLOW - 500 FT SPOOL (SAP # 9334433)	7,965 lf	-	-	1,195	-	-	-	1,195
	ANODE, MAG BAG 17LB 3.5INx25IN (SAP # 9311183)	16 ea	-	-	1,098	-	-	-	1,098
	COUPLING, HDPE 1IN CTS 090x102WL MECH (SAP # 9315605)	1 ea	-	-	7	-	-	-	7
	COUPLING, CSxCS/PE 8IN COMP RESTRAINT BL (SAP # 9315643)	4 ea	-	-	917	-	-	-	917
	ELBOW, HDPE 8IN IPS 90DEG SDR13.5 BTFS (SAP # 9315690)	5 ea	-	-	219	-	-	-	219
	ELBOW, HDPE 8IN IPS 45DEG SDR13.5 BTFS (SAP # 9315946)	35 ea	-	-	1,663	-	-	-	1,663
	TEE, SVCE PLSTC 2IN IPSx8IN SDL FSBL (SAP # 9315940)	1 ea	-	-	49	-	-	-	49
	TEE, HDPE PLSTC 8IN BUTT FUSED (SAP # 9315914)	1 ea	-	-	70	-	-	-	70
	MARKER, PPLN Y TEST STA 3 -1/2INx84IN L (SAP # 9312342)	4 ea	-	-	141	-	-	-	141
	CAP, HDPE 1IN CTS MECH BLIND END 090-102 (SAP # 9312356)	1 ea	-	-	8	-	-	-	8
	CAP, HDPE 8IN IPS BTFS SDR13.5 (SAP # 9312683)	1 ea	-	-	22	-	-	-	22
	SLEEVE, PROTECTIVE 2-1/2INx60IN L PVC (SAP # 9315380)	4 ea	-	-	22	-	-	-	22
	NUT, ADAPTR VALVE OPR 2IN SQ (SAP # 9315459)	8 ea	-	-	192	-	-	-	192
	Fusing/welding Fittings Reducers Elbows	20 dy	480	24,779	-	-	10,602	-	35,381
	3 Tie Ins	4 dy	96	4,956	-	-	2,120	-	7,076
	Silt Fence	9,150 lf	183	9,561	45,750	-	3,979	-	59,291
	Hydroseeding	21,591 sf	276	14,267	4,318	-	6,104	-	24,689
	Hydoseeding Drill Pits	1,400 sf	18	925	1,400	-	396	-	2,721
	Pipe and Valves Retirement Time	20 dy	640	33,438	-	-	13,917	-	47,355
	Matting	820 ea	-	-	-	451,000	-	-	451,000
	Environmental Permits	1 ls	-	-	-	-	-	4,000	4,000
	Permit DOT Permit	1 ls	-	-	-	-	-	5,000	5,000
	Kleinfelder reports	1 ls	-	-	-	15,000	-	-	15,000

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Estimate Detail

C082726-RTE 146 Altamont (Rev1)-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount (S)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Kleeinfelder Supervision	30 dy	-	-	-	62,400	-	-	62,400
	Supervisor - Contractor Drills	16 wk	-	-	-	119,520	-	-	119,520
	Engineering & Design Fees JD Hair	1 ls	-	-	-	6,439	-	-	6,439
	Side walk 400 ft on 146	2,000 sf	94	3,019	32,000	-	1,569	-	36,588
	Pressure Test Every 1500 ft 4 man crew (12 hours every 1500 ft)	480 mh	480	25,079	-	-	4,800	-	29,879
	24 Services to Tie-Over	12 dy	288	14,867	-	-	6,361	-	21,228
	Work Order Transfers 10028693359	1 ls	-	-	-	-	-	35,422	35,422
	NRC Environmental (Actual)	1 ls	-	-	-	3,160	-	-	3,160
	Adirondack Environmental (Actual)	1 ls	-	-	-	12,100	-	-	12,100
	Test Holes Atlantic Testing	1 ls	-	-	-	19,443	-	-	19,443
	Test Holes Atlantic Testing (Actual)	1 ls	-	-	-	25,040	-	-	25,040
	Arcadis (Actual)	1 ls	-	-	-	5,992	-	-	5,992
	NGrid Lead Community Outreach	80 mh	80	4,674	-	-	-	-	4,674
	NGrid Lead Community Outreach (Actual)	83 mh	83	4,849	-	-	-	-	4,849
	NGrid Senior Counsel	12 mh	12	1,020	-	-	-	-	1,020
	NGrid Senior Counsel (Actual)	12 mh	12	1,020	-	-	-	-	1,020
	NGrid Lead Scientist / Environmetal Engineer (Actual)	19 mh	19	988	-	-	-	-	988
	NGrid Estimator (Actual)	17 mh	17	791	-	-	-	-	791
	Traffic Control (ls) DOT FLAGGERS	96 dy	-	-	-	216,000	-	-	216,000
	Arrow Boards	96 dy	-	-	-	8,160	-	-	8,160
	Donnelly Traffic Plan	1 ls	-	-	-	10,000	-	-	10,000
	Traffic Control (ls) RAILROAD FLAGGERS	15 dy	-	-	-	37,500	-	-	37,500
	VALVE, PLUG CS 12IN 150PSIG BW 375WL EPO (SAP # 9312227)	1 ea	-	-	11,800	-	-	-	11,800
	Kleinfelder Geotechnical Bores (8)	1 ls	-	-	-	100,000	-	-	100,000
	Material Allowance	1 ls	-	-	7,500	-	-	-	7,500
G10	**SITEWORK/EARTHWORK**		**3,317**	**172,412**	**42,200**	**-**	**72,630**	**-**	**287,243**
G10.08	**Paving Remove**		**151**	**7,855**	**573**	**-**	**3,290**	**-**	**11,719**
	Saw Cut Asphalt 6" Thick	1,420 lf	95	4,946	-	-	2,059	-	7,005
	Demolition-Road Paving	237 sy	21	1,099	573	-	457	-	2,129
	Haul Waste Excavation to Disposal	39 cy	35	1,810	-	-	774	-	2,584
G10.10	**Sidewalk Removal**		**182**	**9,493**	**-**	**-**	**3,964**	**-**	**13,456**
	Demo Concrete Sidewalks	2,000 sf	160	8,360	-	-	3,479	-	11,839
	Haul Waste Excavation to Disposal	25 cy	22	1,133	-	-	485	-	1,618

Estimate Detail

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Group > Assembly	Description	Quantity	Labor Hours	Labor Amount (S)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
G10.18	HDD1 Stn 7- Stn 18 Entry & Exit Pits		136	7,056	2,326	-	2,965	-	12,347
	Excavation-Trench-Utilities (No Haul) Entry and Exit Pits	19 cy	2	129	-	-	54	-	183
	Utility Backfill/Compact Entry and Exit Pits	19 cy	6	310	220	-	129	-	658
	Haul Waste Excavation to Disposal Entry and Exit Pits	4 cy	3	170	-	-	73	-	243
	Excavation-Trench-Utilities (No Haul) Entry and Exit Pits	19 cy	2	129	-	-	54	-	183
	Utility Backfill/Compact Entry and Exit Pits	19 cy	6	310	220	-	129	-	658
	Haul Waste Excavation to Disposal Entry and Exit Pits	4 cy	3	170	-	-	73	-	243
	Excavation-Trench-Utilities (No Haul) Entry and Exit Pits	19 cy	2	129	-	-	54	-	183
	Utility Backfill/Compact Entry and Exit Pits	19 cy	6	310	220	-	129	-	658
	Haul Waste Excavation to Disposal Entry and Exit Pits	4 cy	3	170	-	-	73	-	243
	Excavation-Trench-Utilities (No Haul) Entry and Exit Pits	19 cy	2	129	-	-	54	-	183
	Utility Backfill/Compact Entry and Exit Pits	19 cy	6	310	220	-	129	-	658
	Haul Waste Excavation to Disposal Entry and Exit Pits	4 cy	3	170	-	-	73	-	243
	Excavation-Trench-Utilities (No Haul) Entry and Exit Pits	19 cy	2	129	-	-	54	-	183
	Utility Backfill/Compact Entry and Exit Pits	19 cy	6	310	220	-	129	-	658
	Haul Waste Excavation to Disposal Entry and Exit Pits	4 cy	3	170	-	-	73	-	243
	Excavation-Trench-Utilities (No Haul) Entry and Exit Pits	19 cy	2	129	-	-	54	-	183
	Utility Backfill/Compact Entry and Exit Pits	19 cy	6	310	220	-	129	-	658
	Haul Waste Excavation to Disposal Entry and Exit Pits	4 cy	3	170	-	-	73	-	243
	Excavation-Trench-Utilities (No Haul) Entry and Exit Pits	19 cy	2	129	-	-	54	-	183
	Utility Backfill/Compact Entry and Exit Pits	19 cy	6	310	220	-	129	-	658
	Haul Waste Excavation to Disposal Entry and Exit Pits	4 cy	3	170	-	-	73	-	243
	Excavation-Trench-Utilities (No Haul)	17 cy	2	116	-	-	48	-	164
	Utility Backfill/Compact	17 cy	5	279	198	-	116	-	592
	Haul Waste Excavation to Disposal	17 cy	15	765	-	-	327	-	1,092
	Excavation-Trench-Utilities (No Haul)	50 cy	7	347	-	-	144	-	491
	Utility Backfill/Compact	50 cy	16	832	591	-	346	-	1,769
	Haul Waste Excavation to Disposal	10 cy	9	457	-	-	195	-	652

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Estimate Detail

C082726-RTE 146 Altamont (Rev1)-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
G10.19	OC Stn 0 - Stn 7		2,849	148,009	39,301	-	62,411	-	249,721
	Excavation-Trench-Utilities (No Haul)	231 cy	31	1,607	-	-	669	-	2,276
	Utility Backfill/Compact	231 cy	74	3,857	2,737	-	1,605	-	8,198
	Haul Waste Excavation to Disposal	46 cy	41	2,117	-	-	906	-	3,023
	Excavation-Trench-Utilities (No Haul)	565 cy	75	3,936	-	-	1,638	-	5,574
	Utility Backfill/Compact	565 cy	181	9,446	6,704	-	3,932	-	20,081
	Haul Waste Excavation to Disposal	113 cy	100	5,185	-	-	2,219	-	7,404
	Excavation-Trench-Utilities (No Haul)	245 cy	33	1,707	-	-	710	-	2,417
	Utility Backfill/Compact	245 cy	78	4,096	2,907	-	1,705	-	8,708
	Haul Waste Excavation to Disposal	49 cy	44	2,248	-	-	962	-	3,210
	Excavation-Trench-Utilities (No Haul)	245 cy	33	1,707	-	-	710	-	2,417
	Utility Backfill/Compact	245 cy	78	4,096	2,907	-	1,705	-	8,708
	Haul Waste Excavation to Disposal	49 cy	44	2,248	-	-	962	-	3,210
	Excavation-Trench-Utilities (No Haul)	261 cy	35	1,820	-	-	758	-	2,578
	Utility Backfill/Compact	261 cy	84	4,369	3,101	-	1,818	-	9,288
	Haul Waste Excavation to Disposal	52 cy	46	2,398	-	-	1,026	-	3,425
	Excavation-Trench-Utilities (No Haul)	571 cy	76	3,975	-	-	1,655	-	5,630
	Utility Backfill/Compact	571 cy	183	9,541	6,771	-	3,971	-	20,283
	Haul Waste Excavation to Disposal	114 cy	101	5,237	-	-	2,241	-	7,478
	Excavation-Trench-Utilities (No Haul)	28 cy	4	195	-	-	81	-	276
	Utility Backfill/Compact	28 cy	9	468	332	-	195	-	995
	Haul Waste Excavation to Disposal	6 cy	5	257	-	-	110	-	367
	Excavation-Trench-Utilities (No Haul)	100 cy	13	697	-	-	290	-	987
	Utility Backfill/Compact	100 cy	32	1,672	1,187	-	696	-	3,554
	Haul Waste Excavation to Disposal	20 cy	18	918	-	-	393	-	1,310
	Excavation-Trench-Utilities (No Haul)	1,067 cy	142	7,431	-	-	3,093	-	10,523
	Utility Backfill/Compact	1,067 cy	341	17,834	12,656	-	7,422	-	37,912
	Haul Waste Excavation to Disposal	1,067 cy	948	48,946	-	-	20,942	-	69,888
G20	SITE IMPROVEMENTS		46	2,405	23,132	-	1,003	-	26,540
G20.13	Paving		46	2,405	23,132	-	1,003	-	26,540
	Rough Grading	238 sy	4	197	-	-	84	-	281
	Asphalt Paving 6 inch (150mm)	2,145 sf	21	1,104	11,566	-	459	-	13,129

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Estimate Detail

C082726-RTE 146 Altamont (Rev1)-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Asphalt Paving 6 inch (150mm)	2,145 sf	21	1,104	11,566	-	459	-	13,129
G30.6	**SITE FUEL DISTRIBUTION**		**3,116**	**162,641**	**107,762**	**-**	**63,193**	**-**	**333,596**
G30.6010	**OC Stn 0 - Stn 7**		**3,116**	**162,641**	**107,762**	**-**	**63,193**	**-**	**333,596**
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	700 lf	-	-	5,950	-	-	-	5,950
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	700 lf	168	8,778	-	-	3,653	-	12,431
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	20 ea	9	486	-	-	202	-	688
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	1,695 lf	-	-	14,408	-	-	-	14,408
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	1,695 lf	407	21,254	-	-	8,846	-	30,100
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	50 ea	23	1,215	-	-	506	-	1,720
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	593 lf	-	-	5,041	-	-	-	5,041
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	593 lf	142	7,436	-	-	3,095	-	10,531
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	20 ea	9	486	-	-	202	-	688
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	735 lf	-	-	6,248	-	-	-	6,248
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	735 lf	176	9,216	-	-	3,836	-	13,052
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	20 ea	9	486	-	-	202	-	688
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	1,703 lf	-	-	14,476	-	-	-	14,476
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	1,703 lf	409	21,354	-	-	8,888	-	30,242
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	50 ea	23	1,215	-	-	506	-	1,720
	PIPE, PLSTC SDR 13.5 12IN IPSx40FT (SAP # 9308344)	597 lf	-	-	10,227	-	-	-	10,227
	Pipe Erection-Straight Run-HDPE-Non-Specific 12 Inch (300mm)	597 lf	251	12,955	-	-	4,362	-	17,317
	Field Butt Fusion Weld-HDPE-SDR13.5 12 Inch (300mm)	20 ea	12	618	-	-	208	-	826
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	605 lf	-	-	5,143	-	-	-	5,143

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Estimate Detail

C082726-RTE 146 Altamont (Rev1)-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	605 lf	145	7,586	-	-	3,157	-	10,744
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	16 ea	7	389	-	-	162	-	551
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	493 lf	-	-	4,191	-	-	-	4,191
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	493 lf	118	6,182	-	-	2,573	-	8,755
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	13 ea	6	316	-	-	131	-	447
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	557 lf	-	-	4,735	-	-	-	4,735
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	557 lf	134	6,984	-	-	2,907	-	9,891
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	14 ea	7	340	-	-	142	-	482
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	383 lf	-	-	3,256	-	-	-	3,256
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	383 lf	92	4,803	-	-	1,999	-	6,801
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	10 ea	5	243	-	-	101	-	344
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	417 lf	-	-	3,545	-	-	-	3,545
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	417 lf	100	5,229	-	-	2,176	-	7,405
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	11 ea	5	267	-	-	111	-	378
	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	84 lf	-	-	832	-	-	-	832
	Pipe Erection-Straight Run-HDPE-Non-Specific 8 Inch (200mm)	84 lf	20	1,053	-	-	438	-	1,492
	Field Butt Fusion Weld-HDPE-SDR13.5 8 Inch (200mm)	8 ea	4	194	-	-	81	-	275
	PIPE, MDPE 3IN IPS 40FT 318WL SDR13.5 (SAP # 9340861)	300 lf	-	-	501	-	-	-	501
	Pipe Erection-Straight Run-HDPE-Non-Specific 2 Inch (50mm)	300 lf	45	2,351	-	-	979	-	3,330
	Field Butt Fusion Weld-HDPE-SDR13.5 3 Inch (80mm)	9 ea	3	144	-	-	60	-	204
	PIPE, HDPE 12IN IPS 40FT 944WL SDR13.5 (SAP # 9314581)	1,800 lf	-	-	29,214	-	-	-	29,214

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Estimate Detail

C082726-RTE 146 Altamont (Rev1)-4.3

Group > Assembly	Description	Quantity	Labor Hours	Labor Amount ($)	Material Amount ($)	Sub Amount ($)	Equip Amount ($)	Other Amount ($)	Total Amount ($)
	Pipe Erection-Straight Run-HDPE-Non-Specific 12 Inch (300mm)	1,800 lf	756	39,499	-	-	13,151	-	52,650
	Field Butt Fusion Weld-HDPE-SDR11 12 Inch (300mm)	50 ea	30	1,562	-	-	520	-	2,082
P25-	**PIPING CS API 5L**		**952**	**49,931**	**14,750**	**-**	**18,224**	**-**	**82,905**
P2512	**HDD1 Stn 7- Stn 18 8" Steel Drill String**		**952**	**49,931**	**14,750**	**-**	**18,224**	**-**	**82,905**
	Pipe Plain End-API-5L-ERW X52-0.322 Wall-Std/Sch 40-8 Inch (200mm)	1,100 lf	-	-	1,100	-	-	-	1,100
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 8 Inch (200mm)	1,100 lf	374	19,540	-	-	8,133	-	27,673
	Field Welds-Cut & Bevel-Std 8 Inch (200mm)	29 ea	51	2,740	-	-	-	-	2,740
	Pipe Plain End-API-5L-ERW X52-0.322 Wall-Std/Sch 40-8 Inch (200mm)	1,365 lf	-	-	13,650	-	-	-	13,650
	Pipe Erection-Straight Run-CS API 5L-Std/Sch 40 8 Inch (200mm)	1,365 lf	464	24,248	-	-	10,092	-	34,340
	Field Welds-Cut & Bevel-Std 8 Inch (200mm)	36 ea	63	3,402	-	-	-	-	3,402
Z10	**GENERAL REQUIREMENTS**		**240**	**12,539**	**2,151**	**8,800**	**5,219**	**-**	**28,709**
Z1000-01	**Mobilization & Demobilization**		**240**	**12,539**	**-**	**-**	**5,219**	**-**	**17,758**
	Move Materials & Tools to Job Site	1 wk	120	6,270	-	-	2,609	-	8,879
	Move Materials & Tools off Job Site	1 wk	120	6,270	-	-	2,609	-	8,879
Z1000-10	**Temporary Construction Facilities**		**-**	**-**	**2,151**	**8,800**	**-**	**-**	**10,951**
	Storage Trailers	16 wk	-	-	-	8,800	-	-	8,800
	Temporary Toilets (wk)	16 wk	-	-	2,151	-	-	-	2,151
	Total		**16,212**	**851,065**	**322,062**	**2,329,463**	**2,836,821**	**958,461**	**7,297,872**

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Material Analysis

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Material ID	Description	Quantity	Unit Price ($/Unit)	Amount ($)
01 52 19.00.A1010	Temporary Toilets (wk)	16 wk	134.42	2,151
01 57 13.00.A1015	Silt Fence	9,150 lf	5.00	45,750
E03-05-00.20.XM1005	Demolition-Road Paving	237 sy	2.42	573
E31-23-23.15.XM1030	Utility Backfill/Compact	3,379 cy	11.86	40,089
E31-23-23.15.XM1030	Utility Backfill/Compact Entry and Exit Pits	19 cy	11.86	220
E31-23-23.15.XM1030	Utility Backfill/Compact Entry and Exit Pits	19 cy	11.86	220
E31-23-23.15.XM1030	Utility Backfill/Compact Entry and Exit Pits	93 cy	11.86	1,099
U12863	Side walk 400 ft on 146	2,000 sf	16.00	32,000
E32 12 16.00A1010	Asphalt Paving 6 inch (150mm)	4,290 sf	5.39	23,132
E32-90-00.21.XM1010	Hydoseeding Drill Pits	1,400 sf	1.00	1,400
E32-90-00.21.XM1010	Hydroseeding	21,591 sf	0.20	4,318
E51031002010016E5	Pipe Plain End-API-5L-ERW X52-0.322 Wall-Std/Sch 40-8 Inch (200mm)	2,465 lf	5.98	14,750
9315643	COUPLING, CSxCS/PE 8IN COMP RESTRAINT BL (SAP # 9315643)	4 ea	229.16	917
9315212	CAP, CS 12IN COMP LINE VENT BLT RESTRAIN (SAP # 9315212)	2 ea	456.05	912
9312356	CAP, HDPE 1IN CTS MECH BLIND END 090-102 (SAP # 9312356)	1 ea	7.99	8
9315605	COUPLING, HDPE 1IN CTS 090x102WL MECH (SAP # 9315605)	1 ea	6.50	7
9314587	TEE, EFT PE2408 2IN IPSx8IN SDL (SAP # 9314587)	1 ea	65.31	65
9315940	TEE, SVCE PLSTC 2IN IPSx8IN SDL FSBL (SAP # 9315940)	1 ea	48.61	49
9340861	PIPE, MDPE 3IN IPS 40FT 318WL SDR13.5 (SAP # 9340861)	300 lf	1.67	501
9310246	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	84 lf	9.90	832
9310246	PIPE, HDPE 8IN IPS 40FT 785WL SDR13.5 (SAP # 9310246)	7,881 lf	8.50	66,989
9312683	CAP, HDPE 8IN IPS BTFS SDR13.5 (SAP # 9312683)	1 ea	21.99	22
9315946	ELBOW, HDPE 8IN IPS 45DEG SDR13.5 BTFS (SAP # 9315946)	35 ea	47.50	1,663
9315690	ELBOW, HDPE 8IN IPS 90DEG SDR13.5 BTFS (SAP # 9315690)	5 ea	43.80	219
9315914	TEE, HDPE PLSTC 8IN BUTT FUSED (SAP # 9315914)	1 ea	70.00	70
9314581	PIPE, HDPE 12IN IPS 40FT 944WL SDR13.5 (SAP # 9314581)	1,800 lf	16.23	29,214
9308344	PIPE, PLSTC SDR 13.5 12IN IPSx40FT (SAP # 9308344)	597 lf	17.13	10,227
9314605	CAP, HDPE 12IN IPS BTFS SDR13.5 (SAP # 9314605)	1 ea	226.83	227
9314428	ELBOW, HDPE 12IN IPS 45DEG SDR13.5 BTFS (SAP # 9314428)	13 ea	301.00	3,913
9314429	ELBOW, HDPE 12IN IPS 90DEG SDR13.5 BTFS (SAP # 9314429)	7 ea	299.48	2,096
9314583	REDUCER, HDPE 12IN IPSx8IN IPS 945x639WL (SAP # 9314583)	1 ea	298.73	299
9312227	VALVE, PLUG CS 12IN 150PSIG BW 375WL EPO (SAP # 9312227)	1 ea	11,800.05	11,800
9311183	ANODE, MAG BAG 17LB 3.5INx25IN (SAP # 9311183)	20 ea	68.62	1,372
9315165	BOX, RDWY 6 IN IDx18 TOP 6-1/2INx30 BOT (SAP # 9315165)	4 ea	75.32	301
9312291	BOX, RDWY TEST 5IDx18 ABS CI COLLAR/COV (SAP # 9312291)	2 ea	26.22	52

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Material Analysis

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Material ID	Description	Quantity	Unit Price ($/Unit)	Amount ($)
9314452	FITTING, LINE STOPPER 12IN IPS SIDE OUT (SAP # 9314452)	1 ea	6,290.84	6,291
9312565	FITTING, SHORT STOPP WELD 12IN CTR BASE (SAP # 9312565)	1 ea	1,333.49	1,333
9314582	FITTING, TRNSN 12IPS ST 0.250IN WALL (SAP # 9314582)	1 ea	858.59	859
9312342	MARKER, PPLN Y TEST STA 3-1/2INx84IN L (SAP # 9312342)	4 ea	35.25	141
9315459	NUT, ADAPTR VALVE OPR 2IN SQ (SAP # 9315459)	10 ea	23.95	240
9315380	SLEEVE, PROTECTIVE 2-1/2INx60IN L PVC (SAP # 9315380)	5 ea	5.38	27
9314603	TEE, TAPPING EFT HDPE 1IN CTSx8IN SDL (SAP # 9314603)	1 ea	26.00	26
9334433	TRACER WIRE, DIRECT BURY USE, COPPER, 12AWG, 7 STRAND, HMW-HDPE 30 MIL INSULATING JACKET, YELLOW - 500 FT SPOOL (SAP # 9334433)	10,362 lf	0.15	1,554
9307909	VALVE, BALL HDPE 12IN IPS BTFS SDR13.5 F (SAP # 9307909)	1 ea	3,632.94	3,633
9315189	Material Allowance	1 ls	7,500.00	7,500
9315189	VALVE, BALL HDPE 8IN IPS BTFS SDR13.5 FU (SAP # 9315189)	4 ea	750.95	3,004
	Total			**322,062**

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Labor Analysis

C082726-RTE 146 Altamont (Rev1)-4.3

			CAP		OPE		COR		Total	
ID	Description	Rate Table	Hours	Amt ($)	Hours	Amt ($)	Hours	Amt ($)	Hours	Amt ($)
	Labor - Craft		**14,574**	**763,072**	**-**	**-**	**928**	**48,306**	**15,502**	**811,378**
81090670	Technician	L-GEN-50hr	120	5,859	-	-	-	-	**120**	**5,859**
81257000	Foreman	L-GEN-50hr	2,414	136,984	-	-	256	14,516	**2,670**	**151,501**
81257223	Welder	L-GEN-50hr	114	6,142	-	-	-	-	**114**	**6,142**
81282028	Lead Mechanic	L-GEN-50hr	1,639	88,793	-	-	160	8,659	**1,799**	**97,452**
81282590	Mechanic	L-GEN-50hr	5,805	314,684	-	-	256	12,633	**6,061**	**327,316**
81282591	Operator Excavator	L-GEN-50hr	2,414	117,931	-	-	256	12,497	**2,670**	**130,429**
81282723	Operator Engineer	L-GEN-50hr	1,061	48,288	-	-	-	-	**1,061**	**48,288**
82001499	Senior Designer	L-MGMT Gas UNY	572	25,656	-	-	-	-	**572**	**25,656**
82001647	Real Estate Representive	L-MGMT Gas UNY	228	10,527	-	-	-	-	**228**	**10,527**
82001711	Senior Surveyor	L-MGMT Gas UNY	113	5,187	-	-	-	-	**113**	**5,187**
CARP	Carpenters	L-GEN-50hr	31	1,102	-	-	-	-	**31**	**1,102**
CEFI	Cement Finishers	L-GEN-50hr	31	1,102	-	-	-	-	**31**	**1,102**
CLAB	Common Building Laborers	L-GEN-50hr	31	816	-	-	-	-	**31**	**816**
	Labor - Management		**709**	**39,687**	**-**	**-**	**-**	**-**	**709**	**39,687**
80000745	Lead Project Manager	L-MGMT Gas UNY	362	21,148	-	-	-	-	**362**	**21,148**
82000353	Estimator	L-MGMT Gas UNY	57	2,653	-	-	-	-	**57**	**2,653**
82000393	Senior Counsel	L-GEN-50hr	24	2,040	-	-	-	-	**24**	**2,040**
82001476	Lead Engineer	L-MGMT Gas UNY	188	10,175	-	-	-	-	**188**	**10,175**
82001478	Engineer	L-MGMT Gas UNY	6	256	-	-	-	-	**6**	**256**
82001825	Lead Gas Sys Operator	L-MGMT Gas UNY	1	58	-	-	-	-	**1**	**58**
82001946	Senior Quality Inspector	L-MGMT Gas UNY	48	2,165	-	-	-	-	**48**	**2,165**
82002201	Lead Scientist / Environmental Engineer	L-GEN-50hr	23	1,192	-	-	-	-	**23**	**1,192**
	Total		**15,284**	**802,760**	**-**	**-**	**928**	**48,306**	**16,212**	**851,065**

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Equipment Analysis

C082726-RTE 146 Altamont (Rev1)-4.3

ID	Description	Hours	Unit Price ($/HR)	Amount ($)
gen-d-drill rig	gen-Drill Rig	2,121	769.12	1,631,431
gen-e-backhoe	gen-Backhoe	2,670	20.49	54,716
gen-t-crew truck	gen-Compressor Truck	2,670	22.08	58,946
gen-t-dump truck	gen-Dump Truck	1,799	19.98	35,941
gen-t-rack truck	gen-Rack Truck	4,791	219.61	1,052,202
t-pick up 4x4	Pick up 4X4	168	12.00	2,016
	Total	**14,219**		**2,835,252**

Date of Request: September 21, 2020 Request No. PACE_AGREE-050
Due Date: October 1, 2020 NMPC Req. No. NM-893

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case Nos. 20-E-0380 and 20-G-0381
Electric and Gas Rates

Request for Information

FROM: Pace Energy and Climate Center; Alliance for a Green Economy, Priya Pookkulam

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: Mandated and Reliability Projects - Gas Safety

Request:

50. Regarding the Albany Loop Project, please explain why the Company "proposes to spend 0.750 million in FY 2022 to continue project development and in-progress engineering" (Testimony of GIOP, pg. 75). Please also provide detailed descriptions of, and a list of expenditures relating to, "project development" and "in- progress engineering" for the Albany Loop Project in FY 2022.

Response:

The project development and in-process engineering expenditures included for the Albany Loop Project in fiscal year 2022 were estimates based on information available at the time of the filing, including the project's timeline, and may be subject to change if the project is modified in the future. Project development and in-process engineering costs are a component of all construction projects, typically incurred in advance of construction, and are essential to the delivery of a project. As indicated on page 74 of the Gas Infrastructure and Operations Panel's direct testimony, the Company identified the Albany Loop Project as the best option to enhance reliability for approximately 50,000 customers in the event of a loss of gas supply and to address vulnerability concerns in the East Gate region. Accordingly, project development and in-process engineering costs are required for advancement of the project.

Project development includes costs associated with permitting activities, such as cultural investigations and environmental delineation, and preliminary material and contractor procurement functions. In-progress engineering includes costs associated with responses to inquiries, site investigation efforts, other data gathering and analytical work, and the preparation of documents and drawings to reflect and/or submit the data collected.

Name of Respondent:
Seth Herman
Peter Metzdorff
Tony Taddeo

Date of Reply:
September 30, 2020

Request No.:	NMPC-25
Requested By:	Niagara Mohawk Power Corporation d/b/a National Grid
Information Requested of:	Staff Pipeline Safety Panel
Date of Request:	December 1, 2020
Response Due Date:	December 11, 2020
Date of Response:	December 9, 2020
Name of Respondent:	Richard George
Subject:	Program and Project Adjustments

Question:

1. Staff Revenue Requirements Panel, Exhibit __ (SRRP-2) made downward adjustments to the items listed below; however, the Staff Gas Infrastructure and Operations Panel did not discuss the rationale behind these adjustments in its testimony, and, in the case of the Critical Infrastructure Security (Regulator Stations) Program, the Staff Security Panel agreed with the Company's program without modification. Please provide Staff's rationale for reducing the funding for the following items:

Item	Reduction ($000s)
a) To adjust IMP/IVP OpEx - IMP (PHMSA Rules)	(184)
b) To adjust IMP/IVP OpEx - IVP (PHMSA Rules)	(333)
c) To adjust Transmission Station Integrity Program	(104)
d) To adjust Critical Infrastructure Security (Regulator Stations)	(10)

Response:

1. These incremental O&M adjustments were incorrectly included in Staff Revenue Requirement Panel's Exhibit__(SRRP-2).