TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO BUILDING OWNERS AND MANAGERS ASSOCIATION

UNDERTAKING NO. JT4.24:

Reference(s): **2B-BOMA-1**

To clarify the general locations, the general distribution of the data centres throughout the territory.

RESPONSE:

Data centers are generally located within Toronto Hydro’s Horseshoe distribution region (i.e. outside of the downtown core).

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO BUILDING OWNERS AND MANAGERS ASSOCIATION

UNDERTAKING NO. JT4.25:

Reference(s): 3-BOMA-3

To provide the monthly peak information by rate class from the forecasting perspective used to derive the Coincident Peak and Non-coincident Peak figures for 2025.

RESPONSE:

Please refer to Appendix A for the monthly peak information by rate class for 2025.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO BUILDING OWNERS AND MANAGERS ASSOCIATION

UNDERTAKING NO. JT4.27:

Reference(s): 3-BOMA-4

To provide a breakdown of the table at 3-BOMA-4 into the three GS classes.

RESPONSE:

Please see Appendix A for a breakdown of the table at 3-BOMA-4 into the three GS classes.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO BUILDING OWNERS AND MANAGERS ASSOCIATION

UNDERTAKING NO. JT4.28:

Reference(s): 3-BOMA-04

To determine whether the load profile information of the multi-residential class includes a breakdown based on number of customers, or based on kilowatt-hours, and if so, to provide the information.

RESPONSE:

As set out in 2B-ED-25, there are an estimated 7,161 MURBs in Toronto Hydro's service territory. Approximately 365 of these are classified as Competitive Sector Multi-Unit Residential Service (CSMUR) and are customers directly suite metered by Toronto Hydro. Please refer to JT4.25 for CSMUR 2025 load profile information.

The remaining MURBs are within a mix of Residential and General Service accounts. The MURBs customers within the General Service classes may be metered by sub-metering companies. As such, Toronto Hydro does not have information on the number of units or the load profiles associated with those accounts.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.20:

Reference(s): 1B-Staff-54(d)

To explain the change to the Non-Wires Solutions program in the context of the NPV calculation and whether it changes the PIM measure or the metric itself.

RESPONSE:

The change to the number of stations targeted by the LDR program did not impact the overall 30 MW target. As such, there are no downstream impacts to the Benefit-Cost Analysis (BCA), the NPV analysis or the PIM resulting from this change.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.21:

Reference(s): 1B-Staff-34(c)

In reference to 1B-Staff-34, Part C, the table compares PIM targets. Provide or request Scott Madden to expand table to include TH's proposed PIM scorecard. Classify the proposed PIMs based on the categories in the table. Consider if its appropriate to put TH PIM against those in the IR in question, and provide or set out rationale for why not.

RESPONSE (PREPARED BY SCOTTMADDEN):

As an initial matter, Toronto Hydro’s performance incentive mechanism is unique and does not necessarily fit within the context of the categories “Penalty” and “Reward”. Penalty-only mechanisms generally impose financial consequences on utilities for failing to meet certain performance standards, targets, or regulations. Reward-only mechanisms generally provide financial incentives for meeting or exceeding certain targets or outcomes. Toronto Hydro’s mechanism provides an upfront discount to the approved ROE that can be earned back by achieving certain performance targets.

However, in the context of Penalty and Reward, Toronto Hydro’s mechanism more closely aligns with Penalty since the approved ROE can only be achieved – all other things the same – if the performance targets are met. In addition, there no opportunity to exceed the approved ROE. Toronto Hydro’s performance incentive mechanism is listed in Table 1 below.

Table 1: Jurisdictional Review of PIMs by Incentive Type

Jurisdiction	Utility	Penalty Only Performance Incentive	Reward Only Performance Incentive	Penalty and Reward Incentives	Total Metrics
Alberta	ATCO Electric	-	-	-	0
California	SDG&E	-	1	-	1
California	PG&E	-	1	-	1
Hawaii	Hawaiian Electric	-	3	2	5
Illinois	Ameren	-	-	1	1
Maine	Central Maine Power	6	-	-	6
Massachusetts	Eversource	7	1	-	8
Minnesota	Northern States Power Co.	-	-	-	0
New Jersey	PSE&G	-	-	-	0
New York	Con Edison	-	7	-	7
New York	National Grid	-	9	-	9
North Carolina	Duke Energy	1	2	-	3
Nova Scotia	Nova Scotia Power	-	-	-	0
Ohio	AEP	-	-	-	0
Pennsylvania	PECO	-	-	-	0
Rhode Island	Rhode Island Energy	4	1	-	5
UK RIIO	General Review	-	-	10	10
Vermont	Green Mountain Power	-	-	-	0
Ontario	Toronto Hydro	12	-	-	12

Table 2 below shows how Toronto Hydro's Custom Scorecard outcome categories align with the incentive outcome categories of other utilities within the jurisdictional review.

1 **Table 2: Jurisdictional Review of PIMs by Incentive Category**

Jurisdiction	Utility	System Reliability & Resilience	Customer Service & Experience	Environment, Safety, & Governance	Efficiency & Financial Performance
Alberta	ATCO Electric				
California	SDG&E	✓			
California	PG&E	✓			
Hawaii	Hawaiian Electric	✓	✓	✓	✓
Illinois	Ameren				✓
Maine	Central Maine Power	✓			
Massachusetts	Eversource	✓			✓
Minnesota	Northern States Power Co.				
New Jersey	PSE&G				
New York	Con Edison	✓		✓	✓
New York	National Grid	✓		✓	✓
North Carolina	Duke Energy	✓	✓	✓	✓
Nova Scotia	Nova Scotia Power				
Ohio	AEP				
Pennsylvania	PECO				
Rhode Island	Rhode Island Energy	✓			✓
UK RIIO	UK RIIO	✓	✓	✓	✓
Vermont	Green Mountain Power				

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.22:

Reference(s): 1B-Staff-34(d)

To ask ScottMadden to comment on trends of the PIMs within the scope of the scan it performed

RESPONSE (PREPARED BY SCOTTMADDEN):

Among the jurisdictions examined, ScottMadden did not find a trend regarding the compensation structure of performance incentive mechanisms and whether recent measures are more penalty or more reward focused.

ScottMadden did find that performance incentive measures are receiving increased attention for their ability to align expanded policy objectives with shareholder and customer interests. Traditionally, performance incentives have been established for utilities to achieve reliability metrics and program-based performance (e.g., achieved kWh savings, kW reduction). However, more recent performance incentives are providing additional earning opportunities for achieving expanded policy objectives, such as distributed energy resource expansion and utilization, renewables integration, beneficial electrification, and dynamic rate enrollment.

Jurisdictions have stated performance incentives are necessary to achieve desired policy outcomes include the Hawaii Commission, which stated "incentive mechanisms can achieve … objectives, such as incenting cost reduction, incenting achievement of policy goals, improving performance, integrating technological advances, supporting new types of customer choice, and encouraging a low-cost, customer-centric future."

In addition, the New York Commission noted that "outcome-based incentives are the most effective approach to address the mismatch between traditional revenue methods and modern electric system needs, while aligning utility shareholder interests with consumer interests."

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.23:

Reference(s): **Exhibit 1B, Tab 2, Schedule 1, Appendix A, Pg 7**

To ask ScottMadden to comment on the similarities and differences between Ofgem's uncertainty mechanisms and Toronto Hydro's proposed variance account; (b) to explain the degree to which other volume drivers were considered, and why the DRVA was chosen over that mechanism

RESPONSE (PREPARED BY SCOTTMADDEN):

Please see the table below for a comparison of the Ofgem uncertainty mechanisms to Toronto Hydro’s proposed DRVA.

	Ofgem Uncertainty Mechanisms	Toronto Hydro DRVA	Comparison
Objectives	▪ Adjust distributor revenue allowances to changes in operating conditions outside of distributor company control	▪ Protects both ratepayers and the utility from structural unknowns in forecasted costs and revenues	▪ Generally consistent
Mechanism Type	▪ Volume-driven: adjusts allowances due to uncertainty about future demand levels (e.g., low carbon technology uptake) ▪ Pass-through: expenditure is outside company control (e.g., pension funding) ▪ Indexed: evolution of prices is unknown (e.g., inflation) ▪ Use-it-or-lose-it: adjusts allowances where a specific activity has to be done but costs are uncertain (e.g., improving reliability for worst-served customers)	▪ Demand-Related Expenditure Variance Subaccount – Due to policy, customer adoption, or technology market uncertainty ▪ Demand-Related Revenue Variance Subaccount – Result from weather-normalized variances in billing determinants (i.e. customer count, kWh and kVA).	▪ DRVA is generally consistent with volume-driven uncertainty mechanism

	Ofgem Uncertainty Mechanisms	Toronto Hydro DRVA	Comparison
	▪ Administrative Re-opener: need, timing, or scope of project is unclear (e.g., net-zero implementation)		
Adjustment Type	▪ Symmetrical	▪ Symmetrical	▪ Generally consistent
Cost Types	▪ For reopeners, both capital and O&M readjusted based on cost assessment ▪ For volume-driven mechanisms, unit rate of incremental capital funding determined at start of price control period – Incremental operational funding provided at a value of 10.8% of each unit of incremental capital provided	▪ Both capital and O&M for demand-related investments	▪ Generally consistent; incremental O&M funding in UK RIIO differs by uncertainty mechanism type
Adjustment Timing	▪ Automatic (pass-through, indexation, use-it-or-lose-it, volume-driven) ▪ During price control period after administrative review (reopeners)	▪ Next rebasing	▪ Ofgem mechanism provides for recovery/ refund within the plan while DRVA defers recovery/ refund until the end of the plan
Materiality Threshold	▪ No materiality threshold for automatic adjustments ▪ Materiality threshold of 0.5% of annual average base revenue for most reopener mechanisms	▪ $1 million materiality threshold	▪ Ofgem provides no materiality threshold for automatic adjustments and a percentage-based threshold for administrative adjustments, whereas the OEB has a $1 million materiality threshold

RESPONSE (PREPARED BY TORONTO HYDRO):

As noted in Exhibit 1B, Tab 2, Schedule 1 at page 35, due to a confluence of external factors (i.e., policy, technology and consumer behaviour changes) Toronto Hydro is entering a period of unprecedented change and transformation, as customers, communities and governments at all levels are actively embarking on an energy transition to mitigate the existential and economic impacts of climate change. Decarbonization is expected to create new roles for electricity, including as an energy source for transportation and building heating systems. While there is certainty that fundamental change is ahead, there are degrees of uncertainty about how that change will unfold (e.g., the pace and adoption of electrified technologies such as EVs and heat pumps; the role of low-emission gas; and the scale of local vs. bulk electricity supply).

In light of the uncertainty and potential for variability noted above, Toronto Hydro requires greater flexibility to manage demand-driven aspects of its plan in order to protect both the rate payers and the utility from structural unknowns in forecasted costs and revenues. The proposed DRVA provides Toronto Hydro the necessary flexibility using a regulatory mechanism (a variance account) that the utility and the OEB have ample experience with over the last two custom IRs.

At this early stage of the energy transition, a volumetric mechanism would be difficult to design and implement since the relationship between volumes and costs/revenues remains subject to structural uncertainties associated with the factors noted above, and higher degree of variability as Toronto Hydro (i) gains experience integrating new technologies into the grid, (ii) adapts to changing policies and customer behaviours, and (iii) develops advanced capabilities to analyze, predict and address these dynamic external factors into its planning and execution processes. For these reasons, a volumetric mechanism may not be able to effectively address the noted concerns with respect to uncertainty and variability in demand, and as a result could impair the utility's flexibility to: (i) protect customers from structural unknowns in forecasted costs and revenues, (ii) adapt to emerging business conditions related to energy transition, and (iii) take least regret actions to prepare the grid and its operations for a decarbonized and electrified future and provide near-and long-term value to ratepayers.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.24:

Reference(s): 1B-DRC-06, Part C

To comment or summarize how the governance framework and the selection of innovation projects or initiatives compares to the other jurisdictions that it reviewed in formulating this innovation fund proposal.

RESPONSE:

As described in the exchange leading up to this undertaking noted in the April 12, 2024, Technical Conference Transcript at page 64, line 27 to page 65, line 22, Toronto Hydro's jurisdictional scan assessed: (i) which jurisdictions/utilities have similar funds as part of their regulatory framework, (ii) what types of innovation form part of these funds, and (iii) how much funding is being allocated to investments in innovation through similar funds. The referenced research did not specifically consider the governance frameworks in other jurisdictions; however, Toronto Hydro's third-party expert Scott Madden did consider this information in the response to Undertaking JT3.36.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.25:

Reference(s): 1B-EP-23, Part E, Pg 3

To ask ScottMadden to provide the criteria it used to select jurisdictions or utilities in its review.

RESPONSE (PREPARED BY SCOTTMADDEN):

Criteria used to select jurisdictions/utilities in ScottMadden's review included:

- Jurisdictions that have passed mandates regarding climate/ clean energy goals
- Jurisdictions that have implemented elements of performance-based regulation
- Utilities that have proposed or implemented performance-based regulation in the context of meeting mandates regarding climate/ clean energy goals

It is important to note the review was not intended to be a jurisdiction-by-jurisdiction review of rate plans.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.26:

Reference(s): 1B-EP-23, Part E, Pg 3

To ask ScottMadden to comment on whether there were utilities that were excluded that are in a similar stage to Toronto Hydro in the energy transition

RESPONSE (PREPARED BY SCOTTMADDEN):

ScottMadden's review did not specifically exclude any jurisdictions or utilities that met the criteria described in JT5.25.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.27:

Reference(s): 1B-EP-23, Part E, Pg 3

To ask ScottMadden to confirm that within the context of Ofgem, it relies heavily on its own analysis to set the revenue requirements, and that under RIIO-ED-2, Ofgem offers incentives to distributors who manage to present forecasts that do better than Ofgem's benchmark for cost categories for which Ofgem has its high confidence in forecasting.

RESPONSE (PREPARED BY SCOTTMADDEN):

Within the Ofgem UK-RIIO context, revenue requirements are largely based on Ofgem's assessment of each distribution company's analysis of expected costs over the price control period. However, we would not characterize it as heavily. Ofgem does use other information outside of a company's own analysis to set revenue requirements, including comparisons of plans from other electric distributors, international benchmarking evidence, and information on historical performance.

In RIIO-2, Ofgem presented the Business Plan Incentive (BPI) mechanism, which is designed to encourage efficient revenue requirements based on justified cost forecasts. Under BPI mechanism, companies present business plans that identify costs and outputs, such as service quality. The quality of the business plans is subject to rewards or penalties up to

+/-2% of the utility revenues.[1] The greater confidence that Ofgem has in the proposed costs, the higher the incentive rate.

[1] Jamasb, Tooraj. "Incentive Regulation of Electricity and Gas Networks in the UK: From RIIO-1 to RIIO-2." Economics of Energy & Environmental Policy, vol. 10, no. 2, Sept. 2021

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.28:

Reference(s): Exhibit 4

To confirm that 2 JA, JB, JC, and JD have been updated, and if not, to file updated versions.

RESPONSE:

Toronto Hydro confirms that it filed updated OEB Appendices 2-JA, 2-JB, 2-JC, and 2-L in response to interrogatory 4-SEC-89.[1]

[1] Toronto Hydro filed the OM&A Programs Table (OEB Appendix 2-JC) instead of the OM&A by USoA Table (OEB Appendix 2-JD) in accordance with section 2.4.2 of the OEB's Filing Requirements for Electricity Distribution Rate Applications (December 15, 2022).

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.29:

Reference(s): **Exhibit 4**

Within the System Access category, to provide the annual contributions by program (Customer and Generation Connections, Externally Initiated Plant Relocations and Expansion, Generation Protection Monitoring and Control, Load Demand, and Metering at that resolution) for the 2023 actual, and project it forward by any year that's affected by the April 2, or January 29 updates.

RESPONSE:

Toronto Hydro notes that the 2025-2029 Customer and Generation Connections (Exhibit 2B, Section E5.1) and Externally Initiated Plant Relocations and Expansion (2B, E5.2) investments plans were not affected by the January 29th and April 2nd updates or by the 2023 actuals and updated bridge. The table below provides the 2023-2029 capital contributions by program/segment updated for 2023 actuals and revised 2024 bridge. The 2025-2029 forecasts align with those provided in Section 4 of each program/segment.

Table 1: System Access Capital Contributions ($ Millions)

Program/Segment	2023	2024	2025	2026	2027	2028	2029
Customer Connections	(71.8)	(71.9)	(82.9)	(89.0)	(94.7)	(100.5)	(106.3)
Generation Connections	(0.1)	0.0	0.0	0.0	0.0	0.0	0.0
Externally Initiated Plant Relocations & Expansion	(68.6)	(75.6)	(81.1)	(61.8)	(46.1)	(46.7)	(48.6)
System Access Capital Contributions	**(140.4)**	**(147.5)**	**(164.0)**	**(150.7)**	**(140.7)**	**(147.2)**	**(154.9)**

There are no capital contributions forecasted for the Generation Protection, Monitoring and Control (2B, E5.5), Load Demand (2B, E5.3) or Metering (2B, E5.4) programs.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.30:

Reference(s): Exhibit 4

For the Station Renewal and IT/OT System programs, to provide the Capex data by segment, by year; similarly for 2023 and any year that may have been affected by the January 29 or April 2 updates.

RESPONSE:

Please see Table 1 and Table 2 below for the updates to the 2023-2024 segment-level capital expenditures for the Stations Renewal and IT/OT Systems programs, respectively. Toronto Hydro notes that there are no changes to the 2025-2029 forecasts for these programs since the application filed on November 17, 2023.

Table 1: Stations Renewal Program Historical & Forecast Program Costs ($ Millions)

Segments	Actual				Bridge	Forecast				
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Stations TS	12.0	16.7	18.8	9.6	19.5	31.1	31.1	30.0	25.0	16.8
Stations MS	11.5	12.4	2.4	3.3	12.0	10.2	11.3	13.4	17.0	18.4
Stations Control & Monitoring	4.7	3.1	5.1	6.9	8.1	11.9	12.1	13.5	13.1	14.2
Stations Ancillary and Battery	1.9	1.2	1.1	2.1	1.0	3.2	2.2	1.9	3.4	2.9
Total	**30.2**	**33.6**	**27.4**	**21.9**	**40.6**	**56.4**	**56.7**	**58.8**	**58.6**	**52.3**

In preparing the response to this undertaking, Toronto Hydro identified an error in Exhibit 2B, Section E8.4, Table 4 at pages 15-16. The 2022 actuals for Communication

Infrastructure was understated by $0.6 million and is corrected in the table below. This error was isolated and does not affect the total costs in that year or the amounts included in the OEB Appendices.

Table 2: IT/OT Historical & Forecast Program Costs ($ Millions)

Segments	Actual				Bridge	Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
IT Hardware	11.6	15.1	14.9	17.3	12.0	17.5	19.8	22.6	18.1	20.3
IT Software	22.2	26.6	42.4	41.6	42.1	38.6	40.6	41.0	33.3	34.8
Communication Infrastructure	3.6	3.0	0.7	2.3	1.8	3.7	2.5	0.9	6.8	1.0
Total	**37.4**	**44.7**	**58.0**	**61.2**	**55.9**	**59.7**	**62.9**	**64.5**	**58.2**	**56.0**

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.32:

Reference(s): Clearspring Working Papers

In Clearspring's working papers, to review the values for approximately 30 entries in the field called alloc and their associated formulas, to make corrections and adjustments as deemed necessary; to comment on findings and provide them to PEG.

RESPONSE (PREPARED BY CLEARSPRING):

The “alloc” field is a calculated ratio that takes a proportion of A&G expenses and allocates those expenses to the total cost amount within the study. This is useful when the sample contains several utilities with G, T, and D functions. Clearspring took the approach of not making data adjustments within the ratio calculation when calculating the allocator.

In deciding not to make adjustments, there are 28 observations out of the 1,642 total observations that are either negative or higher than 100%. If these 28 values are changed to the prior year value (or the next year value for observations in the year 2000), a minor change in the results occurs. Rather than Toronto Hydro having a benchmark score of -22.9% during the 2025 to 2029 CIR period, the score changes to -21.9%.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.33:

Reference(s): **Clearspring Model**

In Clearspring's model, the O&M-based scope variable, to review the values for approximately three companies, to review, comment, provide updates.

RESPONSE (PREPARED BY CLEARSPRING):

The O&M-based scope variable is a calculated ratio that measures the level of D functions relative to G, T, and D within each observation. Clearspring took the approach of not making data adjustments within the ratio calculation when calculating the variable.

In deciding not to make adjustments, there are 3 observations/values out of the 1,642 total observations that are higher than 100%. If these 3 values are changed to the prior year value, a minor change in the results occurs. Rather than Toronto Hydro having a benchmark score of -22.9% during the 2025 to 2029 CIR period, the score changes to -23.3%.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.34:

Reference(s): **Clearspring Working Papers**
1B-Staff-67

Within the Clearspring working papers and with reference to 1B-Staff-67a, distribution substation data, to review the data and comment on whether there are problems in the counting methods; whether corrections would improve the performance of Toronto Hydro; whether the corrected data could be provided in a timely manner; and to provide any other commentary or alternative models that could be informative.

RESPONSE (PREPARED BY CLEARSPRING):

As Clearspring stated in 1B-Staff-67a, there are hundreds of thousands of addresses and observation lines regarding the construction of the substation variables. In reality the number is well over one million data lines. Clearspring undertook extensive data processing efforts to calculate the substation variables with a view of improving the model specification. Clearspring did this utilizing formulas and made a good faith effort in calculating the variables and provided those formulas and all the data in our working papers. It is not feasible in the very short amount of time since this undertaking was requested, nor worthwhile in Clearspring’s view, to examine the data line-by-line. Examining every line would take many weeks, if not months, of work. Clearspring is of the view that its data processing approach was reasonable and the models are enhanced by the inclusion of the substation variables.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.35:

Reference(s): **Clearspring Working Paper**

To clarify and confirm Toronto Hydro's coverage area.

RESPONSE (PREPARED BY CLEARSPRING):

The Clearspring data for Toronto Hydro's service area came from GIS mapping from information subscribed to from Platt's. The 642 km squared number cited by PEG is from the OEB Yearbook data reporting. If the 642 km number is inserted into the model for Toronto Hydro, the benchmark score moves from -22.9% to -27.9%.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.36:

Reference(s): Clearspring Working Paper

To review the variable construction and the interaction between logged and unlogged.

RESPONSE (PREPARED BY CLEARSPRING):

Regarding the interaction term with the percentage overhead and forestation, Clearspring constructed this the same way as we previously did, as contained in the Hydro One Joint Report issued by Clearspring and PEG. We logged the forestation variable and then multiplied that by the percentage of overhead (not logged). While this construction of the variable makes intuitive sense to Clearspring by modifying the elasticity on the forestation variable by the proportion of overhead assets, we note that modifying the variable to also take the natural log of the percentage of overhead assets would create a minor change in the results. Rather than the reported -22.9% benchmark score, when both components are logged the result becomes -20.9%.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.37:

Reference(s): 1B-Staff-60

To provide the full list of instances for the three scale variables in 1B-Staff-60, part b.

RESPONSE (PREPARED BY CLEARSPRING):

The custom elasticities are provided in the Excel file “Dataset Dx Custom Elasticities JT5.37”. The elasticities are found in columns B, C, and D. This file is provided on a confidential basis.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.38:

Reference(s): 1B-Staff-102

To clarify the response to 1B-Staff-102c, whether the congested urban variable referred to cities or metro areas.

RESPONSE (PREPARED BY CLEARSPRING):

As far as Clearspring recalls, it was city populations above 200,000 that originally served as the criterion to be included in the analysis, as referred to in my report in the last Toronto Hydro proceeding [EB-2018-0165]. The vast majority of the congested urban core areas were contained in cities with populations well above 200,000.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.39:

Reference(s): 1B-STAFF-75J

To give the applicant's view of the causes of Toronto Hydro's such poor SAIFI and good SAIDI scores

RESPONSE:

In reviewing the transcript, Toronto Hydro notes that this undertaking does not fully capture the request made by OEB Staff (PEG). The scope of the undertaking is to provide insights from an engineering perspective on underlying causes of Toronto Hydro's SAIFI and SAIDI performance relative to the benchmark in the context of the reliability benchmarking study conducted by Clearspring.

Toronto Hydro's strong SAIDI performance reflects the distributor's commitment over the years to delivering safe and reliable power to its customers while minimizing the duration of interruptions. This commitment is evident not only in the econometric reliability benchmarking study produced by Clearspring, but also when comparing SAIDI trends with those of other large distributors within the Province of Ontario, as shown in 2B-Staff-245. As evident through Customer Engagement, Toronto Hydro's customers also prioritize the need to continue to address the duration of outages when it comes to reliability preferences. From an engineering and operational perspective, Toronto Hydro attributes its strong SAIDI performance over the years to historical investments in renewal and system enhancement efforts. Particularly, the deployment of remote-operable switches (also known as SCADA controlled switches) and investments in enhancements to Toronto

Hydro's Network Management System (NMS) have had significant impacts on minimizing outage duration. SCADA controlled switches provide operational efficiencies, enabling power system controllers to perform remote switching for fault isolation and restoration. Historically, restoration crews on the ground had to perform these tasks manually, which prolonged outages and restoration times. For more information, please see response to 1B-Staff-98.

In regard to higher SAIFI performance relative to the econometric benchmark, Toronto Hydro views this as largely a reflection of its distribution system (e.g. age, condition, topology, existence of legacy equipment, etc.) and its operating environment. As outlined in the Executive Summary (Exhibit 1B, Tab 1, Schedule 1), Toronto Hydro operates in a complex urban environment within the City of Toronto due to the dense nature of the city's population (4,428 people per sq. kilometer), coupled with a growing tree canopy consisting of approximately 11.5 million trees. This requires approximately 15,000 circuit kilometers of overhead conductors and 13,800 circuit kilometers of underground cable to service the city's 630 square kilometers. These realities of the distribution system result in a high volume of short-duration high-impact interruptions. On average, between 2018 to 2022, 23% of SAIFI contribution (excluding MEDs and Loss of Supply) are associated with interruptions lasting less than 5 minutes.

A large share of SAIFI contribution to Toronto Hydro's distribution system originates from the Horseshoe region, which includes feeders that service thousands of customers. Due to the nature of these feeders (length, topology, and customer density), interruptions that occur along the feeder trunk – i.e. system faults downstream of the station circuit breaker and upstream of expulsion or current limiting fuses – result in a high SAIFI impact, interrupting all customers served from the feeder. Furthermore, the realities of Toronto Hydro's operating context can prevent the utility from constraining certain trunk level outages to less than one minute in duration, meaning that a higher proportion of large, but still very short, outages are counted against SAIFI as sustained interruptions. For example, Toronto Hydro makes extensive use of “hold-offs” to ensure employee and third-party safety when working on or near lines. These hold-offs prevent automatic breaker reclosing under fault conditions. Also, Toronto Hydro does not have control authority over transmitter-owned equipment (including feeder circuit breakers) for certain transformer stations in the Horseshoe region, which in turn prolongs restoration times due to incremental coordination requirements with the transmitter. Please see response to 2B-EP-27 for more information on distribution operation and protection practices, and 2B-Staff-162, part (c) for design differences between the Downtown Core and Horseshoe region.

Additionally, Toronto Hydro’s distribution system currently lacks certain advanced technologies aimed at improving system reliability. These include, but are not limited to, the deployment of mid-line reclosers along distribution feeders and the implementation of Fault Location, Isolation, and Service Restoration (‘FLISR’) or Distribution Automation (‘DA’). For more details on Toronto Hydro’s plans within the 2025-2029 rate period for mid-line recloser implementation and other strategic investment initiatives that are designed to improve reliability and resiliency of the distribution system over the long term, please refer to Section E7.1 and D5.2.1. For more details on it’s FLISR implementation, please refer to Section D5.2.1.2 and D5.3.2.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. JT5.40:

Reference(s): Exhibit 1B, Tab 3, Schedule 3, Appendix A, Page 23

Toronto Hydro and Clearspring to comment on declines in THESL's total cost efficiency in 2010 and 2011.

RESPONSE PREPARED BY CLEARSPRING:

In the two years of 2010 and 2011, the Company's costs in the total cost benchmarking study increased by an average annual rate of 9.0%. This total cost increase outpaced the total cost model benchmarks for those years. The model benchmarks estimated an average annual increase of 3.3% during those two years.

RESPONSE PREPARED BY TORONTO HYDRO:

Toronto Hydro respectfully disagrees with the characterization of its 2010 to 2011 cost performance as a decline in cost efficiency. It is Toronto Hydro's understanding that the costs underpinning the Total Costs values undergo a series of normalizations, and as such is unable to comment on the trends using those data points. However, Toronto Hydro is able to comment on capital expenditure and OM&A trends between 2009 and 2011 based on data disclosed in its 2011 EDR (EB-2010-0142) and 2015-2019 CIR (EB-2014-0116) Applications.

<u>Capital Expenditures</u>

The increase in capital expenditures between 2009 and 2010 is primarily attributed to emerging requirements associated with:

- Stations Expansion (Copeland TS project, known as Bremner TS at the time);
- The need to address worst performing feeders (i.e. FESI-7); and
- Safety requirements by replacing and upgrading handwells to reduce the risk of contact voltage.

It is also attributed to incremental requirements to convert smart meters in 2010 and 2011 and to replace underground direct buried cables staring in 2010.

OM&A Expenses

The increases in OM&A costs between 2009 and 2011 were driven by Administrative and Other Costs, in part related to internal resources to support the safe and efficient delivery of the capital and operational work programs over that time. Toronto Hydro notes that its headcount increased by about 200 FTE in that period. A more detailed analysis with respect to the specific drivers for the OM&A increase over this period could not be performed within the timeframe of responding to this undertaking.

TECHNICAL CONFERENCE UNDERTAKING RESPONSES TO ONTARIO ENERGY BOARD STAFF

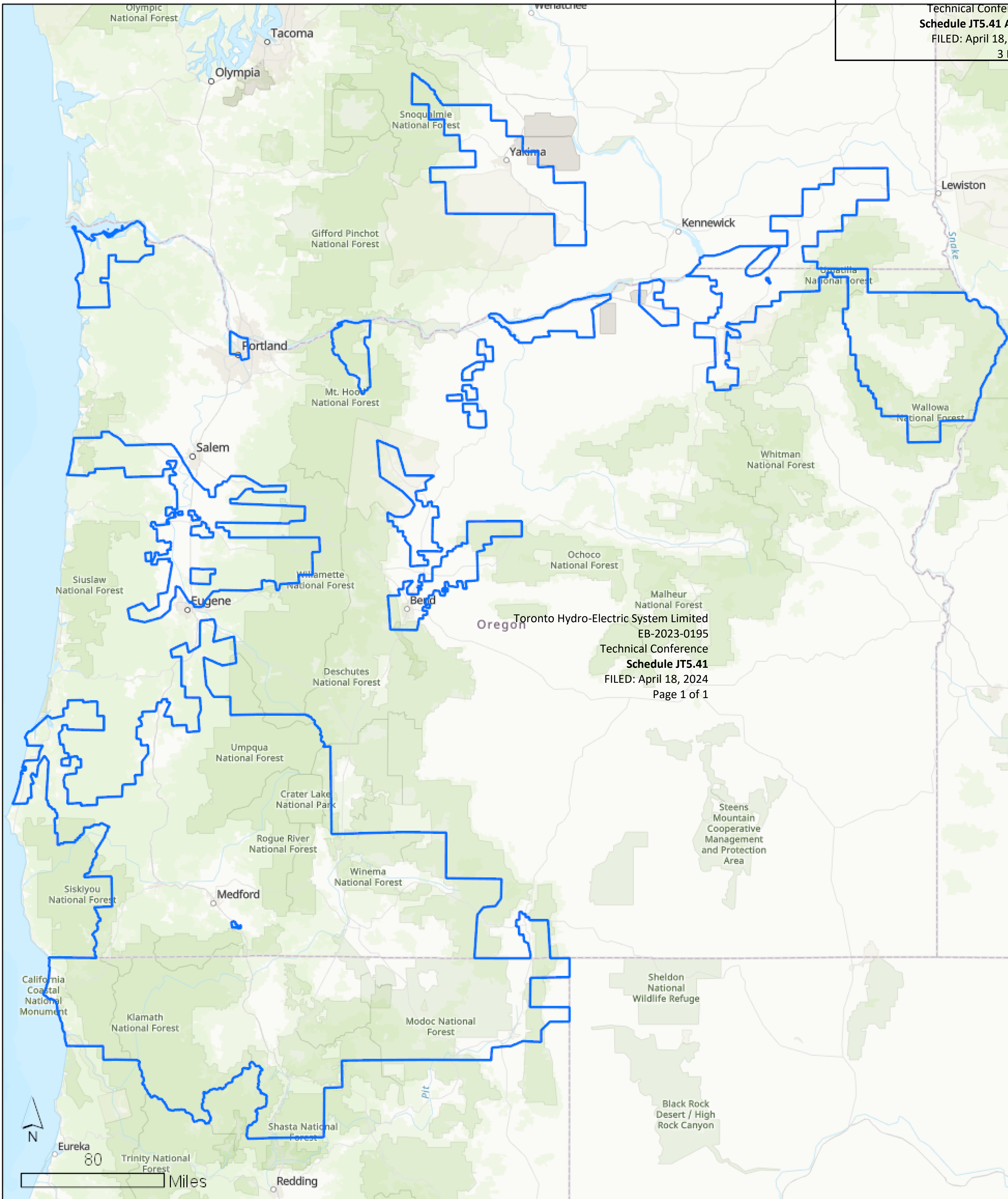
UNDERTAKING NO. JT5.41:

Reference(s): **Clearspring Working Paper**

To file the two maps related to the congested urban variables.

RESPONSE (PREPARED BY CLEARSPRING):

Clearspring examined our files and we have the maps for Potomac Electric Power and PacifiCorp. Regarding PacifiCorp, there are two maps because the company is a merged entity serving the historic territories of Pacific Power and Rocky Mountain Power. The three maps are provided.



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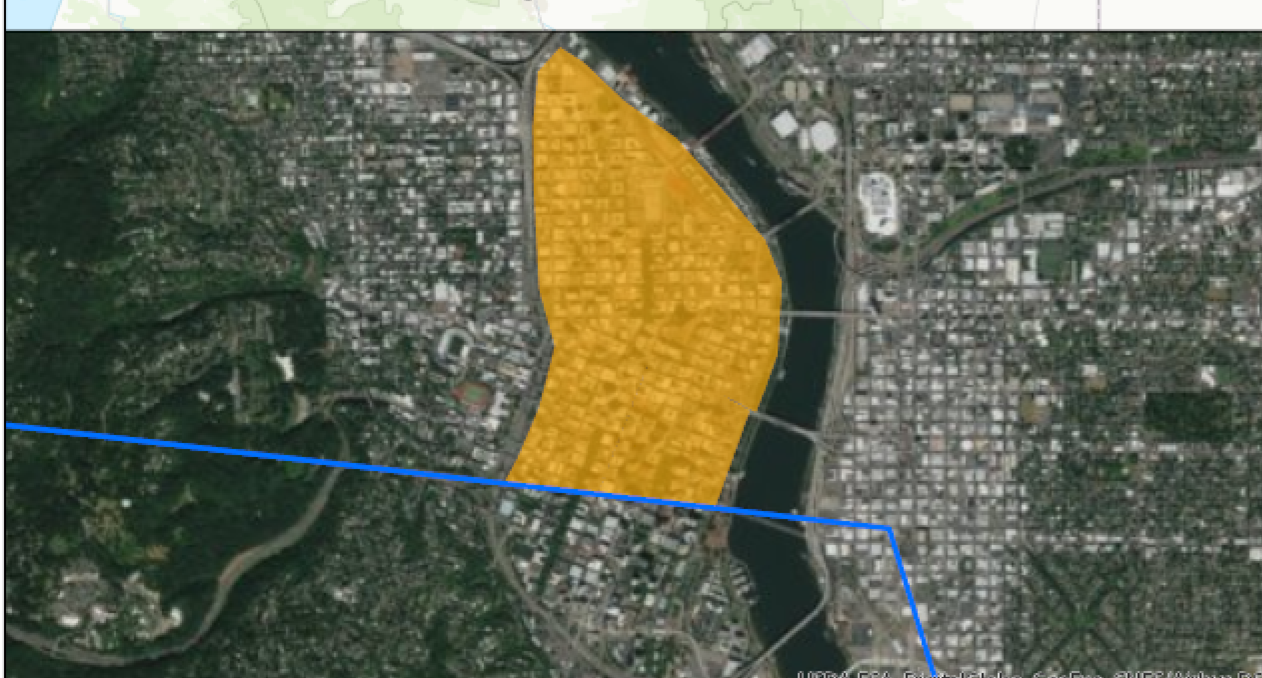
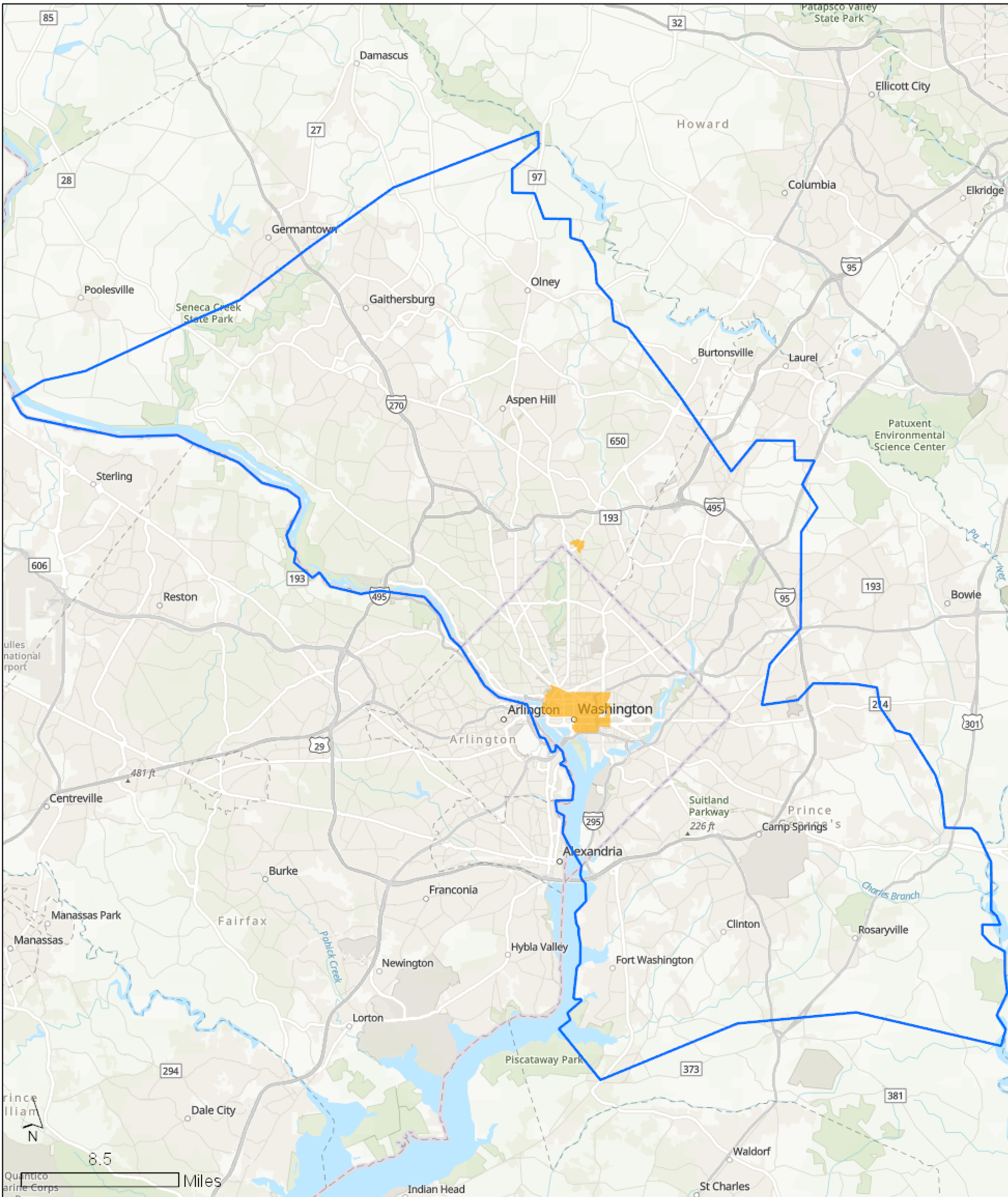
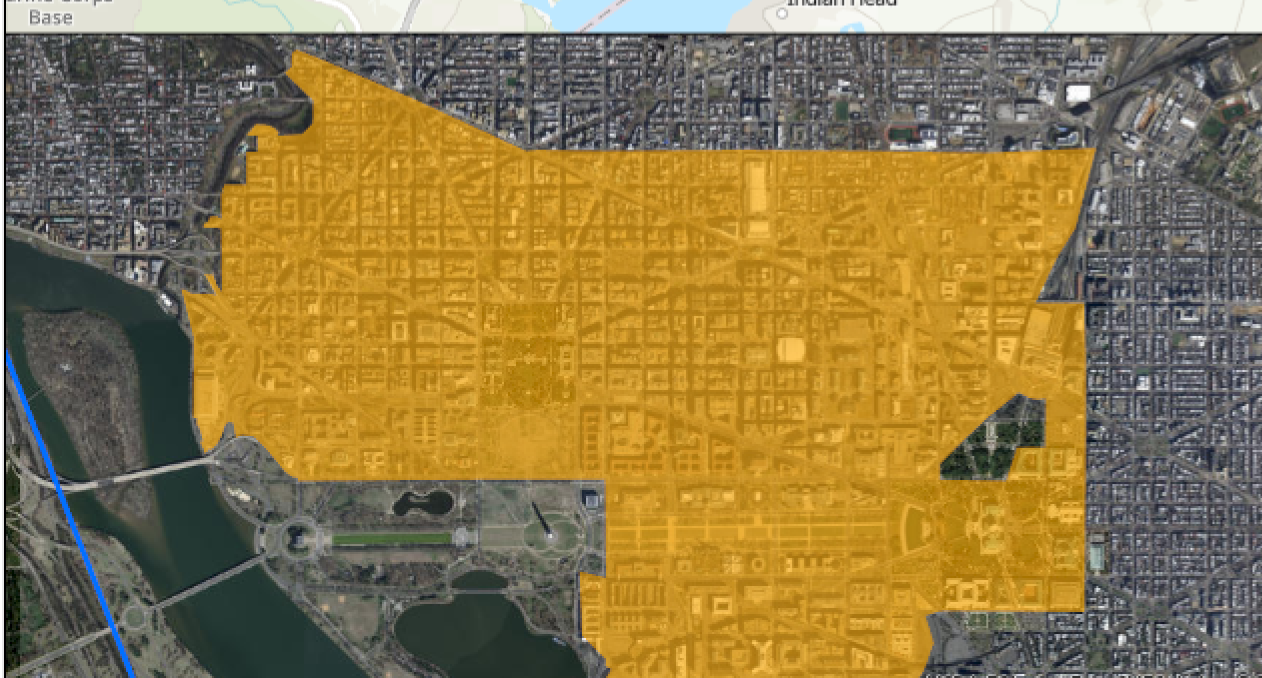


Congested Urban
Service Territory

Percent Congested: 0.0026%

PACIFIC POWER



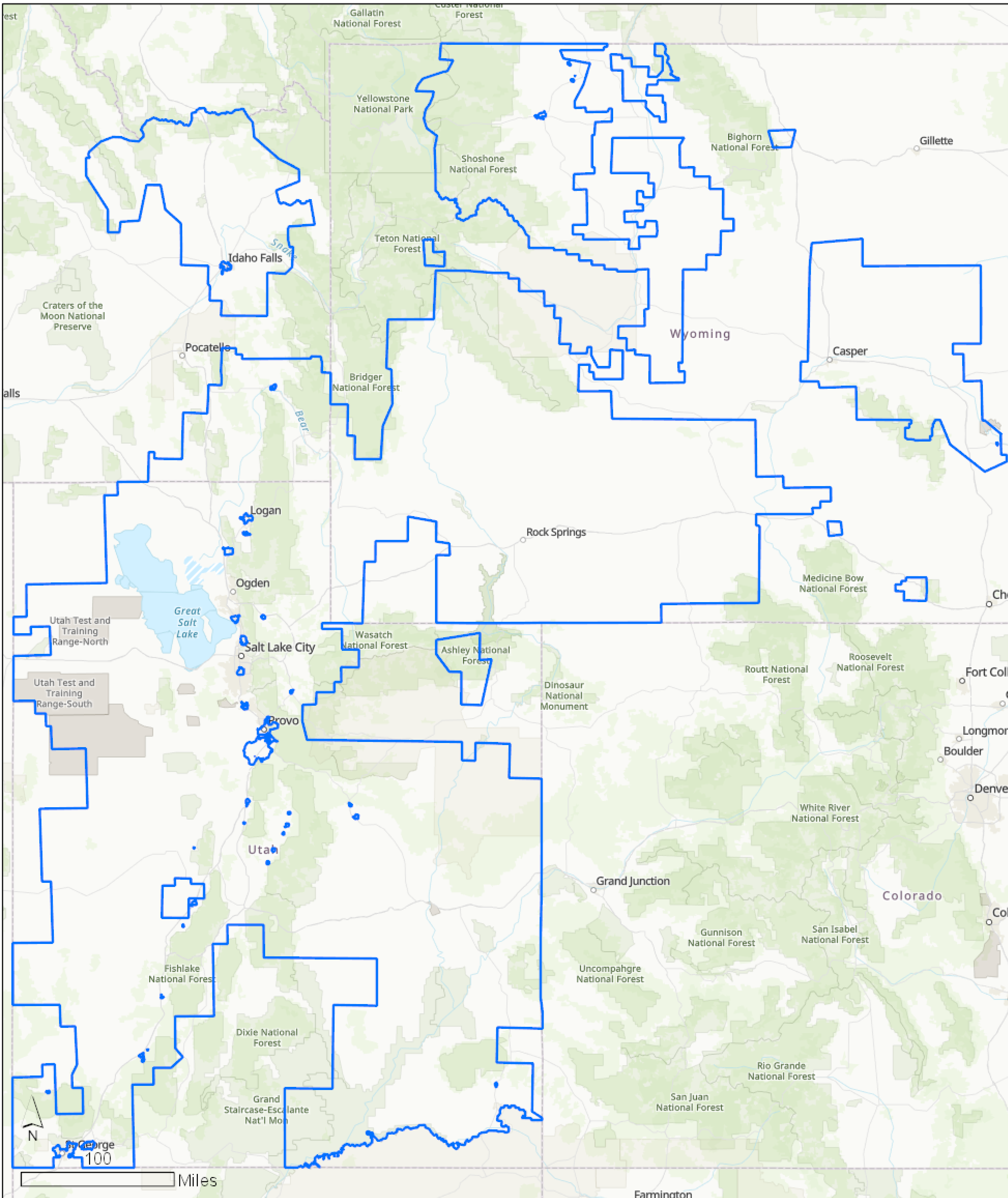


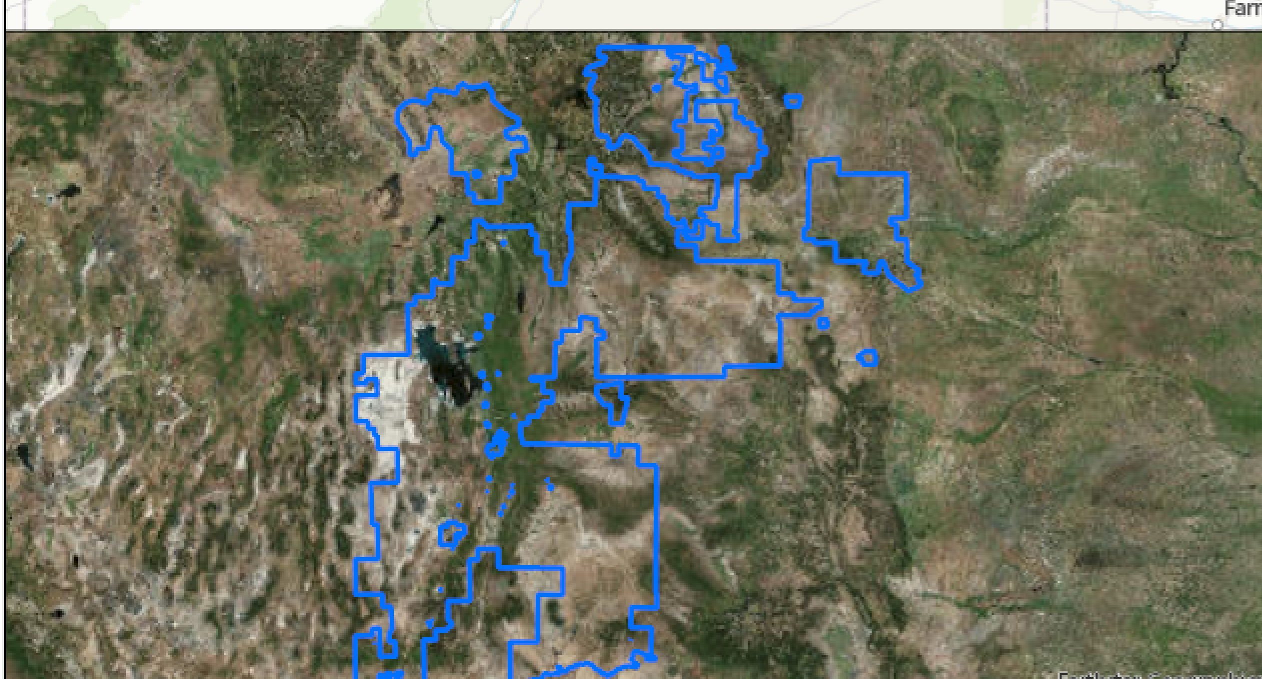
Congested Urban

Service Territory

Percent Congested: 0.6452%

POTOMAC ELECTRIC POWER CO.





Congested Urban

Service Territory

Percent Congested: 0.0000%

ROCKY MOUNTAIN POWER