EXHIBIT 2 – RATE BASE

2027 Cost of Service

Rideau St-Lawrence Distribution Inc.
EB-2026-0069

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2.1. OVERVIEW OF RATE BASE

RLS's methodology of calculating its Rate Base has not changed from its last two costs of service applications (2016 and 2022) and is in line with the OEB's methodology of determining a Rate Base. The net fixed assets used to determine the utility's Rate Base include distribution assets associated with activities that enable the conveyance of electricity for distribution purposes. RLS does not have non-distribution assets, nor does it conduct non-distribution activities. Controllable expenses include operations and maintenance, billing and collecting, and administration costs discussed in detail in Exhibit 4.

RLS has calculated its' Test Year 2027 Rate Base to be $15,545,678. This rate base is also used to determine the proposed revenue requirement found in Exhibit 6. The table below presents RLS's Rate Base calculations for the Test Year compared to the 2022 Board Approved.

Table 1 – Change in Rate Base from 2022BA

Particulars	2022BA.	2027	Var $	Var %
Gross Fixed Assets (average)	$10,021,877	$18,899,363	$8,877,486	88.58%
Accumulated Depreciation (average)	-$3,185,039	-$4,826,714	-$1,641,675	51.54%
Net Fixed Assets (average)	$6,836,838	$14,072,649	$7,235,811	105.84%
Allowance for Working Capital	$1,044,039	$1,473,029	$428,990	41.09%
Total	$7,880,877	$15,545,678	$7,664,801	97.26%

Working Capital Allowance				
Particulars	**2022BA**	**2027**		
3500-Distribution Expenses - Operation	$362,465	$654,159	$291,694	80.47%
3550-Distribution Expenses - Maintenance	$450,600	$692,022	$241,422	53.58%
3650-Billing and collecting	$551,220	$618,562	$67,342	12.22%
3700-Community Relations	$32,500	$24,227	-$8,273	-25.45%
3800-Administrative and General Expenses	$1,085,627	$1,729,967	$644,340	59.35%
Other Expenses or Adjustments	$32,200	$34,377	$2,177	6.76%
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Total Eligible Distribution Expenses	$2,514,612	$3,753,313	$1,238,701	49.26%
Power Supply Expenses	$11,405,913	$15,887,077	$4,481,164	39.29%
Total Expenses for Working Capital	$13,920,525	$19,640,390	$5,719,865	41.09%
Working Capital factor	7.50%	7.50%	$0	0.00%
Total	$1,044,039	$1,473,029	$428,990	41.09%

Table 2 – Rate Base Trend

Particulars	BOARD APPR.	2022	2023	2024	2025	2026	2027
Gross Fixed Assets (average)	$10,021,877	$10,159,634	$11,334,037	$12,470,221	$13,391,722	$16,025,350	$18,899,363
Accumulated Depreciation (average)	-$3,185,039	-$3,185,340	-$3,562,185	-$3,970,508	-$4,411,694	-$4,671,114	-$4,826,714
Net Fixed Assets (average)	$6,836,838	$6,974,294	$7,771,852	$8,499,713	$8,980,027	$11,354,236	$14,072,649
Allowance for Working Capital	$1,044,039	$1,192,883	$1,180,501	$1,320,230	$1,418,535	$1,474,327	$1,473,029
TOTAL	$7,880,877	$8,167,177	$8,952,353	$9,819,944	$10,398,562	$12,828,562	$15,545,678

WORKING CAPITAL ALLOWANCE							
Particulars	BOARD APPR.	2022	2023	2024	2025	2026	2027
3500-Distribution Expenses - Operation	$362,465	$251,389	$393,552	$537,863	$544,362	$592,052	$654,159
3550-Distribution Expenses - Maintenance	$450,600	$530,811	$426,412	$457,861	$683,529	$680,604	$692,022
3650-Billing and Collecting	$551,220	$535,943	$548,247	$552,675	$551,937	$596,041	$618,562
3700-Community Relations	$32,500	$32,838	$25,030	$11,231	$6,068	$23,522	$24,227
3800-Administrative and General Expenses	$1,085,627	$1,304,106	$1,389,662	$1,388,654	$1,503,935	$1,672,788	$1,729,967
Other Expenses or Adjustments	$32,200	$28,684	$29,442	$31,197	$32,403	$33,375	$34,377
Total Eligible Distribution Expenses	$2,514,612	$2,683,772	$2,812,344	$2,979,482	$3,322,235	$3,598,382	$3,753,313
Power Supply Expenses	$11,405,913	$13,221,340	$12,927,669	$14,623,591	$15,591,558	$16,059,305	$15,887,077
Total Expenses for Working Capital	$13,920,525	$15,905,112	$15,740,013	$17,603,073	$18,913,794	$19,657,687	$19,640,390
Working Capital factor	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
TOTAL	**$1,044,039**	**$1,192,883**	**$1,180,501**	**$1,320,230**	**$1,418,535**	**$1,474,327**	**$1,473,029**

Rate base increases materially over the 2022 to 2027 period, rising from approximately $8.2 million in 2022 to approximately $15.5 million in 2027, representing an increase of approximately 90% over the period.

The increase in rate base is primarily driven by growth in net fixed assets, which increase from approximately $7.0 million in 2022 to approximately $14.0 million in 2027. This reflects a sustained increase in capital investments beginning in 2023 through 2027.

As shown in the table above, average gross fixed assets increase significantly over the period, particularly between 2025 and 2026, where investments rise from approximately $13.4 million to $16.0 million, before reaching approximately $18.9 million in 2027. This change in capital spending is only partially offset by the corresponding increase in accumulated depreciation.

The primary drivers of this increase are:

- System access investments to support customer growth, including subdivision development and large customer connections
- Major station and distribution capacity investments, most notably the Iroquois Station MS2 project in 2026
- Ongoing system renewal and modernization programs, including meter replacements and equipment upgrades

Detailed capital drivers and project-level information are provided in Section 2.2 and in the Distribution System Plan.

2.2. FIXED ASSET CONTINUITY SCHEDULE

2.2.1 Fixed Asset Continuity Overview

The table below provides a high-level summary of the continuity of gross fixed assets, accumulated depreciation, and net book value over the 2022 to 2027 period. RSL has prepared this application in accordance with Modified International Financial Reporting Standards (MIFRS) and the Ontario Energy Board's Accounting Procedures Handbook.

All capital expenditures included in this application reflect in-service additions. RSL does not include work in progress (WIP) in rate base. Accordingly, capital expenditures and in-service additions are equivalent for the purposes of this application.

This summary illustrates the relationship between annual capital additions, depreciation, and the resulting growth in net fixed assets, which form the primary component of rate base. As shown, capital additions increase beginning in 2023 and peak in 2026, resulting in a corresponding increase in net book value over the period.

Contributions in Aid of Construction (CIAC) have been determined in accordance with RSL's Conditions of Service and applicable OEB requirements. Supporting details are provided in Appendix A.

Accumulated depreciation increases consistently with the growth in asset balances, partially offsetting the impact of additions on net fixed assets. Detailed continuity schedules by asset account are provided in Appendix 2-BA. Variance explanations and supporting project-level detail are provided in Sections 2.2.2 and in the Distribution System Plan. The opening and closing balances of gross plant and accumulated depreciation reconcile to the fixed asset continuity schedules and to the rate base calculations presented in this Exhibit.

Table 3 – Summary of Fixed Asset Continuity Schedule

Distribution Plant	BOARD APPR.	2022	2023	2024	2025	2026	2027
FIXED ASSET - GROSS BALANCE							
Fixed Asset, Opening Balance	$9,760,871	$9,760,871	$10,558,396	$12,109,679	$12,830,763	$13,952,681	$18,098,019
Additions	$522,012	$804,660	$1,640,959	$722,830	$1,127,578	$4,533,086	$1,608,929
Disposal	$0	-$7,135	-$89,676	-$1,746	-$5,660	-$387,748	-$6,240
Closing balance	$10,282,883	$10,558,396	$12,109,679	$12,830,763	$13,952,681	$18,098,019	$19,700,708
ACCUMULATED DERPRECIATION							
Accumulated Depreciation - Opening Balance	-$2,982,370	-$2,982,370	-$3,388,309	-$3,736,061	-$4,204,954	-$4,618,435	-$4,723,793
Depreciation Expense	-$405,339	-$407,394	-$436,595	-$468,822	-$414,371	-$488,097	-$607,720
Disposal	$0	$1,456	$88,843	-$70	$890	$382,739	$401,876
Closing balance	-$3,387,709	-$3,388,309	-$3,736,061	-$4,204,954	-$4,618,435	-$4,723,793	-$4,929,636
Net Book Value		$7,170,087	$8,373,617	$8,625,809	$9,334,246	$13,374,226	$14,771,072
Average Gross Fixed Assets	$10,021,877	$10,159,634	$11,334,037	$12,470,221	$13,391,722	$16,025,350	$18,899,363
Average Accumulated Depreciation Expense	-$3,185,039	-$3,185,340	-$3,562,185	-$3,970,508	-$4,411,694	-$4,671,114	-$4,826,714
Average Net Fixed Assets	**$6,836,838**	**$6,974,294**	**$7,771,852**	**$8,499,713**	**$8,980,027**	**$11,354,236**	**$14,072,649**

2.2.2 Major Capital Drivers

In addition to fixed asset growth, the working capital allowance increases modestly over the period, from approximately $1.2 million in 2022 to $1.5 million in 2027, reflecting growth in distribution, billing, and administrative expenses. However, this represents a relatively small portion of the overall increase in rate base.

Overall, the increase in rate base is driven predominantly by a concentrated period of capital investment required to support system growth, maintain reliability, and modernize the distribution system, as further detailed in the sections that follow.

RLS notes that it uses “in-service”, “capital additions” and “capital expenditures” interchangeably as RLS does not have any Work in Progress capital projects included in its Rate Base.

The reason for the increase from the 2022 Cost of Service is mainly attributed to the following:

System Access

- Iroquois Station MS2 – approximately $950,000 (2026)
- Valecraft Developments (Iroquois):
  - Phase 1 Subdivision – approximately $505,989 (2026)
  - Phase 2 Subdivision – approximately $120,493 (2027)
  - Valecraft Apartments – approximately $264,635 (2026) and $58,012 (2027)
- Large Customer / Development Connections (selected examples):
- Tesla Morrisburg – approximately $100,663 (2025)
  - Safavieh Warehouse – approximately $112,291 (2025)
  - Morrisburg Housing – approximately $93,561 (2025)

System Renewal and System Service

- Meter Replacement Program (1860):
  - Approximately $42,875 to $67,393 annually (2023–2024)
  - Increasing to approximately $274,700 (2027)
- PCB and Equipment Replacement Programs:
  - Approximately $197,153 (2024) and $135,529 (2025)
- SCADA and System Modernization (NRCan funded):
  - Iroquois – approximately $320,000 (2026)
  - Cardinal – approximately $480,000 (2027)
  - Prescott (MS2/MS3) – approximately $160,000 and $320,000 (2027)
- Station and System Upgrades:
  - Cardinal Transformer and Fan – approximately $450,000 (2026)
  - MS2/MS1 relocation and upgrades (Morrisburg) – approximately $1.2 million cumulative (2022–2024)

These projects represent the primary drivers of the increase in capital additions over the period, particularly the step change observed in 2026. Remaining additions reflect routine, lower-value investments required to maintain and operate the distribution system and are not individually material.

Detailed project descriptions, including need and justification, are provided in the appendices to the Distribution System Plan. Consistent with OEB guidance to avoid duplication, this section summarizes only the primary capital drivers relevant to rate base.

2.2.3 Continuity and Reconciliation

Appendix 2-BA provides the continuity of gross fixed assets, accumulated depreciation, and net book value by USoA account for the historical, bridge and test years.

RSL confirms that:

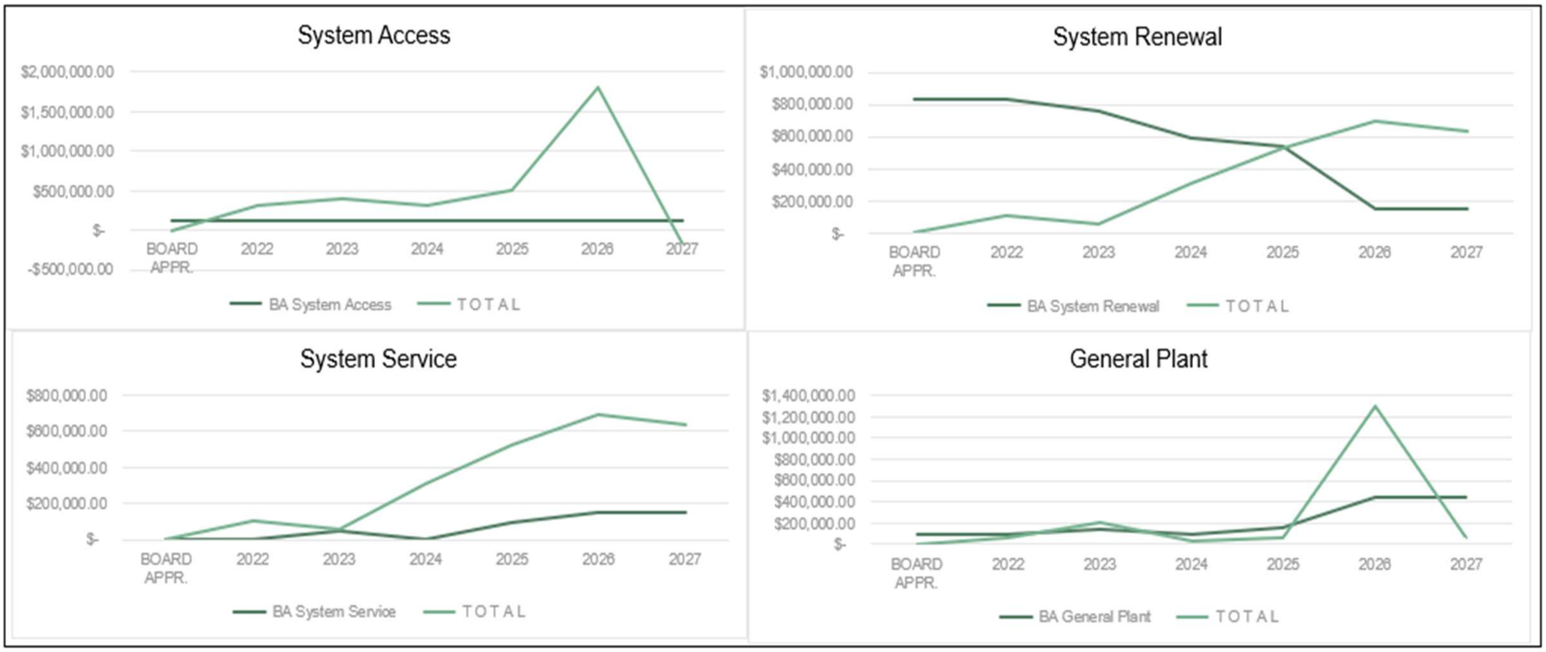
- the continuity schedules reconcile to the depreciation expense presented in Section 2.3
- net book value balances reconcile to the rate base calculation
- all capital additions represent in-service assets, with no work in progress included in rate base
- the Applicant does not have any asset retirement obligations or associated accretion expenses
- The Applicant has not included any previously recorded DVA capital balances in opening test year rate base.

Any differences between opening and closing balances, including those related to timing or classification, are identified and reconciled within Appendix 2-BA. The Excel versions of the OEB appendices are filed in conjunction with this application.

Variance analysis has been provided on a year-over-year basis at the next section 2.2.4, including comparisons of historical actual to prior years, historical to bridge, and bridge to test year, consistent with OEB Filing Requirements.

The Applicant has not included any previously recorded DVA capital balances in opening test year rate base.

2.2.4 Variance Analysis (2022 BA vs 2022-2026)



DSP SUMMARY	BOARD APPR.	2022	2023	2024	2025	2026	2027	GROWTH
BA System Access	$ 128,000.00	$ 128,000.00	$ 128,000.00	$ 128,000.00	$ 128,000.00	$ 128,000.00	$ 128,000.00	$ -
BA System Renewal	$ 835,012.00	$ 835,012.00	$ 758,000.00	$ 593,000.00	$ 537,000.00	$ 145,000.00	$ 145,000.00	-$ 690,012.00
BA System Service	$ -	$ -	$ 49,000.00	$ -	$ 94,000.00	$ 150,000.00	$ 150,000.00	$ 150,000.00
BA General Plant	$ 94,000.00	$ 94,000.00	$ 139,000.00	$ 89,000.00	$ 164,000.00	$ 440,000.00	$ 440,000.00	$ 346,000.00
Board Approved Total	**$ 1,057,012.00**	**$ 1,057,012.00**	**$ 1,074,000.00**	**$ 810,000.00**	**$ 923,000.00**	**$ 863,000.00**	**$ 863,000.00**	**-$ 194,012.00**
Actual CapEx	$ 1,057,012.00	$ 804,660.11	$ 1,640,958.63	$ 722,829.76	$ 1,127,577.46	$ 4,553,073.00	$ 1,608,929.10	$ 551,917.10
Variance	**$ -**	**$ 252,351.89**	**-$ 566,958.63**	**$ 87,170.24**	**-$ 204,577.46**	**-$ 3,690,073.00**	**-$ 745,929.10**	**-$ 745,929.10**

ACTUAL TOTAL	BOARD APPR.	2022	2023	2024	2025	2026	2027	GROWTH
	$ 1,057,012.00	$ 804,660.11	$ 1,640,958.63	$ 722,829.76	$ 1,127,577.46	$ 4,553,073.00	$ 1,608,929.10	$ 551,917.10
Integrity Check (Continuity Schedule)		*$ 804,660.11*	*$ 1,640,958.63*	*$ 722,830.00*	*$ 1,127,577.55*	*$ 4,533,086.00*	*$ 1,608,929.00*	

RSL has compared actual capital expenditures for the 2022–2026 period to the amounts approved in the 2022 Cost of Service application, as summarized in the table above. Variance analysis includes comparison to the last OEB-approved capital plan from the 2022 Cost of Service application, in addition to historical actuals and bridge year values. While the Board-approved capital plan provides a reasonable baseline, actual capital spending varies from year to year in response to evolving system needs, customer-driven connections, and operational requirements.

Variances from Board-approved amounts are primarily attributable to:

- the timing and pace of connection activity, including subdivision development and large customer projects
- condition-based asset replacements and equipment failures identified through ongoing system inspections and maintenance programs

- project timing shifts across years, including deferrals and accelerations due to resource availability, permitting, and coordination with third parties
- external factors such as supply chain constraints, contractor availability, and weather-related events impacting construction schedules

As a result, while individual year variances may be significant, the overall capital program reflects the Applicant's continued focus on maintaining system reliability, supporting customer growth, and managing its distribution assets prudently over the planning horizon.

2.2.5 Variance Analysis (material only)

Year	Type	System Access	System Renewal	System Service	General Plant	Total
2022	In-Service Additions	$301,890	$105,921	$334,397	$62,452	$804,660
2023	In-Service Additions	$402,261	$59,847	$968,787	$210,064	$1,640,959
	YoY Variance	**+$100,371**	**$(46,074)**	**+$634,390**	**+$147,612**	**+$836,299**
2024	In-Service Additions	$306,838	$309,612	$79,804	$26,576	$722,830
	YoY Variance	**$(95,423)**	**+$249,765**	**$(888,983)**	**$(183,488)**	**$(918,129)**
2025	In-Service Additions	$506,881	$523,926	$43,461	$53,309	$1,127,578
	YoY Variance	**+$200,043**	**+$214,314**	**$(36,343)**	**+$26,733**	**+$404,748**
2026	In-Service Additions	$1,795,458	$696,987	$770,000	$1,290,628	$4,553,073
	YoY Variance	**+$1,288,577**	**+$173,061**	**+$726,539**	**+$1,237,319**	**+$3,425,495**
2027	In-Service Additions	$(172,970)	$637,670	$1,079,229	$65,000	$1,608,929
	YoY Variance	**$(1,968,428)**	**$(59,317)**	**+$309,229**	**$(1,225,628)**	**$(2,944,144)**

2022

Capital additions total approximately $0.8 million in 2022 and reflect a normal level of investment across System Access, System Service and General Plant.

System Service investments of approximately $334,397 in 2022 are primarily attributable to the initial phase of the MS2 Morrisburg relocation project, including expenditures of approximately $314,258.

System Access investments of approximately $301,890 in 2022 include several smaller development-related projects, including:

- Fibre-to-the-home investments in Prescott of approximately $201,499 and $17,950
- Fibre-to-the-home investments in Cardinal of approximately $177,491
- Prescott Arena connection of approximately $124,703

General Plant investments of approximately $62,452 reflect routine investments in IT equipment, tools and facilities.

2023

Capital additions increase from approximately $0.8 million in 2022 to approximately $1.6 million in 2023. As shown in the table above, this increase is driven primarily by System Service investments.

System Service investments total approximately $968,787 in 2023, of which approximately $849,682 relates to the continuation of the MS2 Morrisburg relocation project. This represents the majority of System Service spending in the year and the primary driver of the year-over-year increase.

System Access investments increase to approximately $402,261 in 2023 and include:

- Westport Phase II subdivision work of approximately $160,897
- Fibre-to-the-home investments in Morrisburg of approximately $107,511
- Fibre-to-the-home investments in Cardinal and surrounding areas, including approximately $28,941 and $6,649
- MacEwen's Edward Street connection of approximately $44,026

General Plant investments of approximately $210,064 reflect increased investment in computer software (approximately $66,150), tools, and vehicle-related expenditures.

These projects represent the primary drivers of the increase in capital additions in 2023.

2024

Capital additions in 2024 total approximately $0.7 million. As shown in the table above, System Service investments decrease significantly by approximately $888,983 compared to 2023, following the substantial completion of the MS2 Morrisburg relocation project.

System Renewal investments increase to approximately $309,612 in 2024 and are primarily attributable to:

- PCB replacement program of approximately $197,153
- meter replacement activity of approximately $67,393

- distribution system upgrades, including Church Street Iroquois work of approximately $127,850

System Access investments of approximately $306,838 reflect continued development-related activity, including:

- Quality Inn Prescott connection of approximately $67,629
- MacEwen's Edward Street work of approximately $65,655
- Tesla Morrisburg early-stage investment of approximately $22,713

The decrease in System Service investments more than offsets increases in System Renewal and System Access, resulting in a net decrease in total capital additions.

2025

Capital additions increase in 2025 to approximately $1.1 million. As shown in the table above, this increase is driven by System Renewal and System Access, which increase by approximately $214,000 and $200,000, respectively.

System Renewal investments total approximately $523,926 in 2025 and are primarily attributable to the PCB replacement program (approximately $135,529), ongoing meter replacement activity (approximately $32,000), and station-related upgrades, including Morrisburg Plaza kiosk replacements of approximately $260,000.

System Access investments total approximately $506,881 in 2025 and include several material customer-driven projects, including the Safavieh Warehouse connection (approximately $112,291), the Tesla Morrisburg connection (approximately $100,663), and the Morrisburg Housing development (approximately $93,561).

2026

A significant increase occurs in 2026, where capital additions rise to approximately $4.6 million. As shown in the table above, this increase is driven across multiple categories, including System Access (increase of approximately $1.3 million), General Plant (increase of approximately $1.2 million), and System Service (increase of approximately $727,000).

System Access investments total approximately $1,795,458 in 2026 and are primarily attributable to major growth-related infrastructure, including the Iroquois Station MS2 project (approximately $950,000), Valecraft Phase 1 subdivision development (approximately $505,989), and Valecraft Apartments (approximately $264,635), together with other customer-driven investments such as the Prescott 44kV line for PLTC (approximately $300,000) and the Rosebay grocery store connection (approximately $91,656).

System Service investments of approximately $770,000 include SCADA implementation at Iroquois (approximately $320,000) and the Cardinal transformer and fan installation (approximately $450,000).

General Plant investments total approximately $1,290,628 in 2026 and are primarily driven by a one-time vehicle acquisition of approximately $1,225,628, together with routine investments in tools, IT, and equipment.

2027

Capital additions decrease in 2027 to approximately $1.6 million, reflecting the completion of major capital projects in 2026 and a return to more typical levels of investment.
System Access shows a net decrease of approximately $1.97 million year-over-year, resulting in a negative value of approximately $(172,970), which reflects the timing of capital contributions associated with growth-related projects, including Valecraft developments.

System Service investments increase to approximately $1,079,229 in 2027 and are primarily attributable to continued SCADA implementation, including:

- Cardinal SCADA of approximately $480,000
- Prescott MS2 and MS3 SCADA investments of approximately $160,000 and $320,000

System Renewal investments of approximately $637,670 reflect continued investment in replacement programs and system upgrades, including:

- meter replacement program (approximately $32,000)
- distribution system and safety-related investments

General Plant investments decrease significantly to approximately $65,000 following the one-time vehicle acquisition in 2026 of approximately $1,225,628.

These changes reflect a normalization of capital spending following the peak investment year in 2026.

2.2.6 Addition of Previously Approved ACM Assets to Rate Base

Background and ACM Approval (2022)

The Morrisburg Substation #2 (MS2), originally placed in service in 1989, was identified through a third-party condition assessment as being in critical condition and requiring replacement. In its 2022 Cost of Service application, Rideau St. Lawrence Distribution Inc. (RSL) planned a two-phase relocation project, with $500,000 forecast in 2022 and $500,000 in 2023.

In March and April 2022, RSL determined that the substation would not be energized until 2023 due to supply chain delays and construction timing. As a result, RSL revised its capital treatment to align with the “used and useful” principle, retaining $225,000 of feeder-related work in 2022 rate base and deferring $275,000 of station-related assets to 2023.

To maintain regulatory efficiency, the parties agreed to recover the deferred and future capital through an Advanced Capital Module (ACM) approved as part of the 2022 settlement. The ACM combined the deferred $275,000 with the 2023 forecast of $500,000, resulting in an OEB-approved eligible ACM amount of $775,000.

ACM Recovery Mechanism (Interim Period)

Consistent with OEB policy, the approved ACM amount was recovered on an interim basis through OEB-approved rate riders. These rate riders were calculated solely on the approved eligible amount of $775,000 and were designed to recover the associated annual revenue requirement prior to rebasing.

All amounts collected through the ACM rate riders were recorded in Account 1508 sub-accounts, in accordance with the Accounting Procedures Handbook. These balances reflect the cumulative difference between the revenue requirement associated with the approved ACM amount, and the actual amounts recovered through rate riders over the interim period.

No recovery was provided for capital expenditures in excess of the approved ACM amount through these rate riders.

Test Year Treatment and Request for Approval

The MS2 project was placed in service in 2023, with total actual capital expenditures of $849,682.

RSL is seeking approval to include the full actual in-service amount of $849,682 in rate base for the Test Year, including the associated accumulated depreciation.

This treatment is appropriate and consistent with OEB policy for the following reasons:

- ACM is an interim funding mechanism only: The ACM approval established the amount eligible for interim rate rider recovery, not a cap on the value of assets to be included in rate base at rebasing.
- No duplication of recovery: ACM rate rider revenues, recorded in Account 1508, are not included in rate base. These amounts will be addressed separately through disposition (Exhibit 9).
- Unrecovered variance: The difference between actual costs ($849,682) and the approved ACM amount ($775,000), being $74,682, has not been recovered through any prior mechanism.
- Prudence of actual costs: The variance reflects updated scope and final construction costs typical of infrastructure projects of this nature.

Transition from Deferral Accounts to Rate Base

Upon rebasing, ACM-approved assets and the associated accumulated depreciation are incorporated into rate base. Any amounts previously recovered through ACM rate riders have been appropriately reflected in the disposition of Account 1508 and are not included for recovery in the test year revenue requirement.

The disposition of any remaining Account 1508 balances, including ACM rate rider revenues, is addressed separately in Exhibit 9.

RSL is not proposing any new Incremental Capital Module (ICM) or Advanced Capital Module (ACM) projects as part of this application.

Table 4 – 2022 Continuity schedule

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)					ACCUMULATED DEPRECIATION					AVG NET FIXED	
Description	Opening Balance for 2022	Additions for 2022	Disposals for 2022	Closing Balance for 2022	Opening Balance for 2022	Additions / Depr.Exp.	Disposals for 2022	Closing Balance for 2022	Net Book Value for 2022	AVG Gross Bal	AVG AccDep
Computer Software (Formally known as Account 1925)	$ 374,476	$ 38,268	$ -	$ 412,744	-$ 274,565	-$ 36,149	$ -	-$ 310,714	$ 102,030	$ 393,610	-$ 292,640
Land	$ 91,567	$ -	$ -	$ 91,567	$ -	$ -	$ -	$ -	$ 91,567	$ 91,567	$ -
Buildings	$ 98,143	$ -	$ -	$ 98,143	-$ 16,709	-$ 2,184	$ -	-$ 18,893	$ 79,250	$ 98,143	-$ 17,801
Distribution Station Equipment <50 kV	$ 1,340,639	$ -	$ -	$ 1,340,639	-$ 274,455	-$ 41,124	$ -	-$ 315,579	$ 1,025,059	$ 1,340,639	-$ 295,017
Poles, Towers & Fixtures	$ 1,825,788	$ 539,891	-$ 6,449	$ 2,359,231	-$ 170,738	-$ 48,796	$ 1,324	-$ 218,210	$ 2,141,021	$ 2,092,509	-$ 194,474
Overhead Conductors & Devices	$ 1,969,828	$ 242,687	$ -	$ 2,212,515	-$ 245,198	-$ 38,820	$ -	-$ 284,018	$ 1,928,498	$ 2,091,172	-$ 264,608
Underground Conduit	$ 131,365	$ 42,056	$ -	$ 173,421	-$ 9,321	-$ 3,158	$ -	-$ 12,479	$ 160,942	$ 152,393	-$ 10,900
Underground Conductors & Devices	$ 853,502	$ 70,226	$ -	$ 923,728	-$ 165,265	-$ 26,231	$ -	-$ 191,496	$ 732,233	$ 888,615	-$ 178,380
Line Transformers	$ 1,272,219	$ 255,443	-$ 687	$ 1,526,976	-$ 166,312	-$ 34,455	$ 132	-$ 200,636	$ 1,326,340	$ 1,399,598	-$ 183,474
Services (Overhead & Underground)	$ 436,908	$ 43,622	$ -	$ 480,530	-$ 47,690	-$ 8,490	$ -	-$ 56,180	$ 424,350	$ 458,719	-$ 51,935
Meters	$ 122,715	$ -	$ -	$ 122,715	-$ 54,250	-$ 10,037	$ -	-$ 64,287	$ 58,428	$ 122,715	-$ 59,268
Meters (Smart Meters)	$ 1,139,048	$ 59,802	$ -	$ 1,198,850	-$ 646,274	-$ 93,164	$ -	-$ 739,438	$ 459,413	$ 1,168,949	-$ 692,856
Leasehold Improvements	$ 15,718	$ -	$ -	$ 15,718	-$ 8,676	-$ 1,176	$ -	-$ 9,852	$ 5,866	$ 15,718	-$ 9,264
Computer Equip.-Hardware(Post Mar. 22/04)	$ 241,384	$ 18,184	$ -	$ 259,568	-$ 187,255	-$ 19,993	$ -	-$ 207,248	$ 52,320	$ 250,476	-$ 197,251
Transportation Equipment	$ 917,614	$ -	$ -	$ 917,614	-$ 685,971	-$ 66,421	$ -	-$ 752,392	$ 165,222	$ 917,614	-$ 719,182
Tools, Shop & Garage Equipment	$ 96,220	$ 4,601	$ -	$ 100,821	-$ 57,432	-$ 8,201	$ -	-$ 65,633	$ 35,188	$ 98,520	-$ 61,533
Communications Equipment	$ 29,223	$ 1,399	$ -	$ 30,622	-$ 25,882	-$ 882	$ -	-$ 26,764	$ 3,858	$ 29,923	-$ 26,323
Deferred Revenue5	-$ 1,195,486	-$ 511,520	$ -	-$ 1,707,006	$ 53,623	$ 31,887	$ -	$ 85,510	-$ 1,621,496	-$ 1,451,246	$ 69,567
TOTAL PP&E FOR RATE BASE	$ 9,760,871	$ 804,660	-$ 7,135	$ 10,558,396	-$ 2,982,370	-$ 407,394	$ 1,456	-$ 3,388,309	$ 7,170,087	$ 10,159,634	-$ 3,185,340
WIP	$ 51,415	$ 215,622	-$ 51,415	$ 215,622							
Deferred Revenue (Fully Allocated)						$ 31,887					
TOTAL	$ 9,709,456	$ 589,038	$ 44,280	$ 10,342,774	-$ 2,982,370	-$ 439,281	$ 1,456	-$ 3,420,196	$ 6,922,577	$ 10,026,115	-$ 3,201,283

Table 5 – 2023 Continuity schedule

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)					ACCUMULATED DEPRECIATION					AVG NET FIXED	
Description	Opening Balance for 2023	Additions for 2023	Disposals for 2023	Closing Balance for 2023	Opening Balance for 2023	Additions / Depr.Exp.	Disposals for 2023	Closing Balance for 2023	Net Book Value for 2023	AVG Gross Bal	AVG AccDep
Computer Software (Formally known as Account 1925)	$ 412,744	$ 66,150	$ -	$ 478,894	-$ 310,714	-$ 38,978	$ -	-$ 349,693	$ 129,202	$ 445,819	-$ 330,203
Land	$ 91,567	$ -	$ -	$ 91,567	$ -	$ -	$ -	$ -	$ 91,567	$ 91,567	$ -
Buildings	$ 98,143	$ 19,950	$ -	$ 118,093	-$ 18,893	-$ 2,583	$ -	-$ 21,476	$ 96,617	$ 108,118	-$ 20,184
Distribution Station Equipment <50 kV	$ 1,340,639	$ -	$ -	$ 1,340,639	-$ 315,579	-$ 41,124	$ -	-$ 356,703	$ 983,935	$ 1,340,639	-$ 336,141
Poles, Towers & Fixtures	$ 2,359,231	$ 491,224	-$ 242	$ 2,850,213	-$ 218,210	-$ 58,010	-$ 255	-$ 276,475	$ 2,573,738	$ 2,604,722	-$ 247,342
Overhead Conductors & Devices	$ 2,212,515	$ 176,724	$ -	$ 2,389,240	-$ 284,018	-$ 42,315	$ -	-$ 326,333	$ 2,062,907	$ 2,300,878	-$ 305,175
Underground Conduit	$ 173,421	$ 72,139	$ -	$ 245,560	-$ 12,479	-$ 4,300	$ -	-$ 16,779	$ 228,781	$ 209,491	-$ 14,629
Underground Conductors & Devices	$ 923,728	$ 139,060	$ -	$ 1,062,789	-$ 191,496	-$ 27,729	$ -	-$ 219,224	$ 843,564	$ 993,258	-$ 205,360
Line Transformers	$ 1,526,976	$ 601,510	-$ 365	$ 2,128,121	-$ 200,636	-$ 43,963	$ 28	-$ 244,571	$ 1,883,550	$ 1,827,548	-$ 222,604
Services (Overhead & Underground)	$ 480,530	$ 50,753	$ -	$ 531,284	-$ 56,180	-$ 9,277	$ -	-$ 65,457	$ 465,827	$ 505,907	-$ 60,818
Meters	$ 122,715	$ -	$ -	$ 122,715	-$ 64,287	-$ 10,161	$ -	-$ 74,448	$ 48,267	$ 122,715	-$ 69,367
Meters (Smart Meters)	$ 1,198,850	$ 42,875	$ -	$ 1,241,726	-$ 739,438	-$ 94,172	$ -	-$ 833,609	$ 408,116	$ 1,220,288	-$ 786,523
Leasehold Improvements	$ 15,718	$ -	$ -	$ 15,718	-$ 9,852	-$ 1,176	$ -	-$ 11,028	$ 4,690	$ 15,718	-$ 10,440
Computer Equip.-Hardware(Post Mar. 22/04)	$ 259,568	$ 6,308	$ -	$ 265,876	-$ 207,248	-$ 19,164	$ -	-$ 226,412	$ 39,464	$ 262,722	-$ 216,830
Transportation Equipment	$ 917,614	$ 127,236	-$ 89,069	$ 955,781	-$ 752,392	-$ 73,644	$ 89,069	-$ 736,966	$ 218,815	$ 936,697	-$ 744,679
Tools, Shop & Garage Equipment	$ 100,821	$ 10,370	$ -	$ 111,190	-$ 65,633	-$ 8,269	$ -	-$ 73,902	$ 37,288	$ 106,006	-$ 69,768
Communications Equipment	$ 30,622	$ -	$ -	$ 30,622	-$ 26,764	-$ 1,022	$ -	-$ 27,786	$ 2,836	$ 30,622	-$ 27,275
Deferred Revenue5	-$ 1,707,006	-$ 163,342	$ -	-$ 1,870,348	$ 85,510	$ 39,291	$ -	$ 124,802	-$ 1,745,546	-$ 1,788,677	$ 105,156
TOTAL PP&E FOR RATE BASE	$ 10,558,396	$ 1,640,959	-$ 89,676	$ 12,109,679	-$ 3,388,309	-$ 436,595	$ 88,843	-$ 3,736,061	$ 8,373,617	$ 11,334,037	-$ 3,562,185
WIP	$ 215,622	$ 10,627	-$ 208,946	$ 17,303							
Deferred Revenue (Fully Allocated)						$ 39,291					
TOTAL	$ 10,342,774	$ 1,630,331	$ 119,270	$ 12,092,375	-$ 3,388,309	-$ 475,887	$ 88,843	-$ 3,775,353	$ 8,317,022	$ 11,217,574	-$ 3,581,831

Table 6 – 2024 Continuity schedule

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)					ACCUMULATED DEPRECIATION					AVG NET FIXED	
Description	Opening Balance for 2024	Additions for 2024	Disposals for 2024	Closing Balance for 2024	Opening Balance for 2024	Additions / Depr.Exp.	Disposals for 2024	Closing Balance for 2024	Net Book Value for 2024	AVG Gross Bal	AVG AccDep
Computer Software (Formally known as Account 1925)	$ 478,894	$ 7,000	$ -	$ 485,894	-$ 349,693	-$ 54,058	$ -	-$ 403,751	$ 82,144	$ 482,394	-$ 376,722
Land	$ 91,567	$ -	$ -	$ 91,567	$ -	$ -	$ -	$ -	$ 91,567	$ 91,567	$ -
Buildings	$ 118,093	$ -	$ -	$ 118,093	-$ 21,476	-$ 2,982	$ -	-$ 24,458	$ 93,635	$ 118,093	-$ 22,967
Distribution Station Equipment <50 kV	$ 1,340,639	$ 52,185	$ -	$ 1,392,824	-$ 356,703	-$ 41,704	$ -	-$ 398,407	$ 994,416	$ 1,366,731	-$ 377,555
Poles, Towers & Fixtures	$ 2,850,213	$ 269,021	-$ 1,043	$ 3,118,191	-$ 276,475	-$ 68,654	$ 176	-$ 344,953	$ 2,773,237	$ 2,984,202	-$ 310,714
Overhead Conductors & Devices	$ 2,389,240	$ 31,596	$ -	$ 2,420,836	-$ 326,333	-$ 44,051	$ -	-$ 370,384	$ 2,050,452	$ 2,405,038	-$ 348,358
Underground Conduit	$ 245,560	$ 51,262	$ -	$ 296,822	-$ 16,779	-$ 5,534	$ -	-$ 22,313	$ 274,509	$ 271,191	-$ 19,546
Underground Conductors & Devices	$ 1,062,789	$ 61,138	$ -	$ 1,123,927	-$ 219,224	-$ 32,467	$ -	-$ 251,691	$ 872,235	$ 1,093,358	-$ 235,458
Line Transformers	$ 2,128,121	$ 258,214	-$ 703	$ 2,385,632	-$ 244,571	-$ 53,474	-$ 246	-$ 298,291	$ 2,087,341	$ 2,256,877	-$ 271,431
Services (Overhead & Underground)	$ 531,284	$ 77,030	$ -	$ 608,314	-$ 65,457	-$ 10,341	$ -	-$ 75,798	$ 532,516	$ 569,799	-$ 70,627
Meters	$ 122,715	$ -	$ -	$ 122,715	-$ 74,448	-$ 8,650	$ -	-$ 83,098	$ 39,617	$ 122,715	-$ 78,773
Meters (Smart Meters)	$ 1,241,726	$ 76,427	$ -	$ 1,318,153	-$ 833,609	-$ 75,979	$ -	-$ 909,588	$ 408,564	$ 1,279,939	-$ 871,599
Leasehold Improvements	$ 15,718	$ -	$ -	$ 15,718	-$ 11,028	-$ 1,176	$ -	-$ 12,204	$ 3,514	$ 15,718	-$ 11,616
Computer Equip.-Hardware(Post Mar. 22/04)	$ 265,876	$ 8,625	$ -	$ 274,501	-$ 226,412	-$ 17,577	$ -	-$ 243,989	$ 30,512	$ 270,188	-$ 235,200
Transportation Equipment	$ 955,781	$ -	$ -	$ 955,781	-$ 736,966	-$ 86,193	$ -	-$ 823,159	$ 132,622	$ 955,781	-$ 780,063
Tools, Shop & Garage Equipment	$ 111,190	$ 10,952	$ -	$ 122,142	-$ 73,902	-$ 8,029	$ -	-$ 81,931	$ 40,211	$ 116,666	-$ 77,917
Communications Equipment	$ 30,622	$ -	$ -	$ 30,622	-$ 27,786	-$ 1,022	$ -	-$ 28,808	$ 1,814	$ 30,622	-$ 28,297
Deferred Revenue5	-$ 1,870,348	-$ 180,620	$ -	-$ 2,050,968	$ 124,802	$ 43,069	$ -	$ 167,871	-$ 1,883,097	-$ 1,960,658	$ 146,336
TOTAL PP&E FOR RATE BASE	$ 12,109,679	$ 722,830	-$ 1,746	$ 12,830,763	-$ 3,736,061	-$ 468,822	$ 70	-$ 4,204,954	$ 8,625,809	$ 12,470,221	-$ 3,970,508
WIP	$ 17,303	$ 247,065	-$ 17,303	$ 247,065							
Deferred Revenue (Fully Allocated)						$ 43,069					
TOTAL	$ 12,092,375	$ 475,765	$ 15,557	$ 12,583,698	-$ 3,736,061	-$ 511,891	-$ 70	-$ 4,248,023	$ 8,335,675	$ 12,338,037	-$ 3,992,042

Table 7 – 2025 Continuity schedule

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)					ACCUMULATED DEPRECIATION					AVG NET FIXED	
Description	Opening Balance for 2025	Additions for 2025	Disposals for 2025	Closing Balance for 2025	Opening Balance for 2025	Additions / Depr.Exp.	Disposals for 2025	Closing Balance for 2025	Net Book Value for 2025	AVG Gross Bal	AVG AccDep
Computer Software (Formally known as Account 1925)	$ 485,894		$ -	$ 485,894	-$ 403,751	-$ 32,688	$ -	-$ 436,438	$ 49,456	$ 485,894	-$ 420,094
Land	$ 91,567		$ -	$ 91,567	$ -	$ -	$ -	$ -	$ 91,567	$ 91,567	$ -
Buildings	$ 118,093		$ -	$ 118,093	-$ 24,458	-$ 2,982	$ -	-$ 27,440	$ 90,653	$ 118,093	-$ 25,949
Distribution Station Equipment <50 kV	$ 1,392,824	$ 16,511	$ -	$ 1,409,334	-$ 398,407	-$ 42,467	$ -	-$ 440,875	$ 968,460	$ 1,401,079	-$ 419,641
Poles, Towers & Fixtures	$ 3,118,191	$ 138,370	-$ 1,759	$ 3,254,802	-$ 344,953	-$ 72,820	$ 358	-$ 417,415	$ 2,837,387	$ 3,186,496	-$ 381,184
Overhead Conductors & Devices	$ 2,420,836	$ 50,602	$ -	$ 2,471,438	-$ 370,384	-$ 45,094	$ -	-$ 415,478	$ 2,055,960	$ 2,446,137	-$ 392,931
Underground Conduit	$ 296,822	$ 3,630	$ -	$ 300,452	-$ 22,313	-$ 6,083	$ -	-$ 28,397	$ 272,055	$ 298,637	-$ 25,355
Underground Conductors & Devices	$ 1,123,927	$ 44,530	$ -	$ 1,168,456	-$ 251,691	-$ 32,670	$ -	-$ 284,361	$ 884,095	$ 1,146,191	-$ 268,026
Line Transformers	$ 2,385,632	$ 1,019,463	-$ 3,901	$ 3,401,194	-$ 298,291	-$ 67,670	$ 532	-$ 365,430	$ 3,035,764	$ 2,893,413	-$ 331,861
Services (Overhead & Underground)	$ 608,314	$ 98,250	$ -	$ 706,563	-$ 75,798	-$ 11,802	$ -	-$ 87,600	$ 618,963	$ 657,438	-$ 81,699
Meters	$ 122,715		$ -	$ 122,715	-$ 83,098	-$ 8,650	$ -	-$ 91,748	$ 30,967	$ 122,715	-$ 87,423
Meters (Smart Meters)	$ 1,318,153	$ 121,411	$ -	$ 1,439,564	-$ 909,588	-$ 52,808	$ -	-$ 962,397	$ 477,167	$ 1,378,858	-$ 935,993
Leasehold Improvements	$ 15,718		$ -	$ 15,718	-$ 12,204	-$ 1,176	$ -	-$ 13,380	$ 2,338	$ 15,718	-$ 12,792
Computer Equip.-Hardware(Post Mar. 22/04)	$ 274,501	$ 4,339	$ -	$ 278,840	-$ 243,989	-$ 14,266	$ -	-$ 258,255	$ 20,585	$ 276,670	-$ 251,122
Transportation Equipment	$ 955,781	$ 32,153	$ -	$ 987,934	-$ 823,159	-$ 63,988	$ -	-$ 887,147	$ 100,787	$ 971,858	-$ 855,153
Tools, Shop & Garage Equipment	$ 122,142	$ 16,817	$ -	$ 138,960	-$ 81,931	-$ 9,070	$ -	-$ 91,002	$ 47,958	$ 130,551	-$ 86,466
Communications Equipment	$ 30,622	$ -	$ -	$ 30,622	-$ 28,808	-$ 1,022	$ -	-$ 29,830	$ 792	$ 30,622	-$ 29,319
Deferred Revenue5	-$ 2,050,968	-$ 418,498	$ -	-$ 2,469,465	$ 167,871	$ 50,886	$ -	$ 218,757	-$ 2,250,708	-$ 2,260,217	$ 193,314
TOTAL PP&E FOR RATE BASE	$ 12,830,763	$ 1,127,578	-$ 5,660	$ 13,952,681	-$ 4,204,954	-$ 414,371	$ 890	-$ 4,618,435	$ 9,334,246	$ 13,391,722	-$ 4,411,694
WIP	$ 247,065	$ 1,381,430	-$ 236,307	$ 1,392,188							
Deferred Revenue (Fully Allocated)						$ 50,886					
TOTAL	$ 12,583,698	-$ 253,853	$ 230,647	$ 12,560,493	-$ 4,204,954	-$ 465,257	$ 890	-$ 4,669,321	$ 7,891,171	$ 12,572,095	-$ 4,437,138

Table 8 – 2026 Continuity schedule

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)					ACCUMULATED DEPRECIATION					AVG NET FIXED	
Description	Opening Balance for 2026	Additions for 2026	Disposals for 2026	Closing Balance for 2026	Opening Balance for 2026	Additions / Depr.Exp.	Disposals for 2026	Closing Balance for 2026	Net Book Value for 2026	AVG Gross Bal	AVG AccDep
Computer Software (Formally known as Account 1925)	$ 485,894	$ 15,000	$ -	$ 500,894	-$ 436,438	-$ 26,683	$ -	-$ 463,121	$ 37,773	$ 493,394	-$ 449,780
Land	$ 91,567	$ 100,000	$ -	$ 191,567	$ -	$ -	$ -	$ -	$ 191,567	$ 141,567	$ -
Buildings	$ 118,093	$ -	$ -	$ 118,093	-$ 27,440	-$ 2,982	$ -	-$ 30,422	$ 87,671	$ 118,093	-$ 28,931
Distribution Station Equipment <50 kV	$ 1,409,334	$ 1,720,000	$ -	$ 3,129,334	-$ 440,875	-$ 61,762	$ -	-$ 502,637	$ 2,626,698	$ 2,269,334	-$ 471,756
Poles, Towers & Fixtures	$ 3,254,802	$ 259,842	-$ 1,847	$ 3,512,797	-$ 417,415	-$ 77,603	$ 376	-$ 494,642	$ 3,018,155	$ 3,383,800	-$ 456,029
Overhead Conductors & Devices	$ 2,471,438	$ 160,418	$ -	$ 2,631,856	-$ 415,478	-$ 44,895	$ -	-$ 460,373	$ 2,171,483	$ 2,551,647	-$ 437,925
Underground Conduit	$ 300,452	$ 86,852	$ -	$ 387,304	-$ 28,397	-$ 6,988	$ -	-$ 35,385	$ 351,919	$ 343,878	-$ 31,891
Underground Conductors & Devices	$ 1,168,456	$ 247,444	$ -	$ 1,415,900	-$ 284,361	-$ 36,320	$ -	-$ 320,681	$ 1,095,219	$ 1,292,178	-$ 302,521
Line Transformers	$ 3,401,194	$ 1,075,782	-$ 4,096	$ 4,472,880	-$ 365,430	-$ 90,951	$ 558	-$ 455,823	$ 4,017,057	$ 3,937,037	-$ 410,626
Services (Overhead & Underground)	$ 706,563	$ 125,336	$ -	$ 831,899	-$ 87,600	-$ 13,665	$ -	-$ 101,265	$ 730,634	$ 769,231	-$ 94,432
Meters	$ 122,715		$ -	$ 122,715	-$ 91,748	-$ 8,650	$ -	-$ 100,398	$ 22,317	$ 122,715	-$ 96,073
Meters (Smart Meters)	$ 1,439,564	$ 18,784	$ -	$ 1,458,348	-$ 962,397	-$ 57,481	$ -	-$ 1,019,878	$ 438,470	$ 1,448,956	-$ 991,137
Leasehold Improvements	$ 15,718	$ 19,000	$ -	$ 34,718	-$ 13,380	-$ 2,126	$ -	-$ 15,506	$ 19,212	$ 25,218	-$ 14,443
Computer Equip.-Hardware(Post Mar. 22/04)	$ 278,840	$ 16,000	$ -	$ 294,840	-$ 258,255	-$ 11,124	$ -	-$ 269,379	$ 25,461	$ 286,840	-$ 263,817
Transportation Equipment	$ 987,934	$ 1,225,628	-$ 381,805	$ 1,831,757	-$ 887,147	-$ 101,066	$ 381,805	-$ 606,408	$ 1,225,349	$ 1,409,846	-$ 746,778
Tools, Shop & Garage Equipment	$ 138,960	$ 15,000	$ -	$ 153,960	-$ 91,002	-$ 8,024	$ -	-$ 99,026	$ 54,934	$ 146,460	-$ 95,014
Communications Equipment	$ 30,622		$ -	$ 30,622	-$ 29,830	-$ 651	$ -	-$ 30,481	$ 141	$ 30,622	-$ 30,156
Deferred Revenue5	-$ 2,469,465	-$ 552,000	$ -	-$ 3,021,465	$ 218,757	$ 62,874	$ -	$ 281,631	-$ 2,739,834	-$ 2,745,465	$ 250,194
TOTAL PP&E FOR RATEMAKING	$ 13,952,681	$ 4,533,086	-$ 387,748	$ 18,098,019	-$ 4,618,435	-$ 488,097	$ 382,739	-$ 4,723,793	$ 13,374,226	$ 16,025,350	-$ 4,671,114
WIP	$ 1,392,188	$ 100,000	-$ 1,392,188	$ 100,000							
Deferred Revenue (Fully Allocated)						$ 62,874					
TOTAL	$ 12,560,493	$ 4,433,086	$ 1,004,440	$ 17,998,019	-$ 4,618,435	-$ 550,971	$ 382,739	-$ 4,786,667	$ 13,211,352	$ 15,279,256	-$ 4,702,551

Table 9 – 2027 Continuity schedule

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)					ACCUMULATED DEPRECIATION					AVG NET FIXED	
Description	Opening Balance for 2027	Additions for 2027	Disposals for 2027	Closing Balance for 2027	Opening Balance for 2027	Additions / Depr.Exp.	Disposals for 2027	Closing Balance for 2027	Net Book Value for 2027	AVG Gross Bal	AVG AccDep
Computer Software (Formally known as Account 1925)	$ 500,894	$ 15,000	$ -	$ 515,894	-$ 463,121	-$ 24,356	$ -	-$ 487,477	$ 28,417	$ 508,394	-$ 475,299
Land	$ 191,567	$ 55,000	$ -	$ 246,567	$ -	$ -	$ -	$ -	$ 246,567	$ 219,067	$ -
Buildings	$ 118,093	$ -	$ -	$ 118,093	-$ 30,422	-$ 2,982	$ -	-$ 33,404	$ 84,689	$ 118,093	-$ 31,913
Distribution Station Equipment <50 kV	$ 3,129,334	$ 535,000	$ -	$ 3,664,334	-$ 502,637	-$ 86,817	$ -	-$ 589,454	$ 3,074,880	$ 3,396,834	-$ 546,045
Poles, Towers & Fixtures	$ 3,512,797	$ 94,148	-$ 1,939	$ 3,605,006	-$ 494,642	-$ 81,536	$ 395	-$ 575,783	$ 3,029,223	$ 3,558,902	-$ 535,213
Overhead Conductors & Devices	$ 2,631,856	$ 164,848	$ -	$ 2,796,704	-$ 460,373	-$ 47,605	$ -	-$ 507,978	$ 2,288,726	$ 2,714,280	-$ 484,176
Underground Conduit	$ 387,304	$ -	$ -	$ 387,304	-$ 35,385	-$ 7,856	$ -	-$ 43,241	$ 344,063	$ 387,304	-$ 39,313
Underground Conductors & Devices	$ 1,415,900	$ 19,983	$ -	$ 1,435,883	-$ 320,681	-$ 39,662	$ -	-$ 360,344	$ 1,075,539	$ 1,425,892	-$ 340,512
Line Transformers	$ 4,472,880	$ 382,709	-$ 4,301	$ 4,851,288	-$ 455,823	-$ 107,157	$ 586	-$ 562,393	$ 4,288,895	$ 4,662,084	-$ 509,108
Services (Overhead & Underground)	$ 831,899	$ 66,482	$ -	$ 898,381	-$ 101,265	-$ 15,264	$ -	-$ 116,529	$ 781,852	$ 865,140	-$ 108,897
Meters	$ 122,715	$ -	$ -	$ 122,715	-$ 100,398	-$ 8,000	$ -	-$ 108,398	$ 14,317	$ 122,715	-$ 104,398
Meters (Smart Meters)	$ 1,458,348	$ 280,759	$ -	$ 1,739,107	-$ 1,019,878	-$ 68,116	$ -	-$ 1,087,994	$ 651,112	$ 1,598,727	-$ 1,053,936
Leasehold Improvements	$ 34,718	$ 19,000	$ -	$ 53,718	-$ 15,506	-$ 3,534	$ -	-$ 19,039	$ 34,679	$ 44,218	-$ 17,272
Computer Equip.-Hardware(Post Mar. 22/04)	$ 294,840	$ 16,000	$ -	$ 310,840	-$ 269,379	-$ 11,857	$ -	-$ 281,236	$ 29,604	$ 302,840	-$ 275,307
Transportation Equipment	$ 1,831,757	$ -	$ -	$ 1,831,757	-$ 606,408	-$ 160,225	$ 400,895	-$ 365,738	$ 1,466,019	$ 1,831,757	-$ 486,073
Tools, Shop & Garage Equipment	$ 153,960	$ 15,000	$ -	$ 168,960	-$ 99,026	-$ 9,277	$ -	-$ 108,302	$ 60,657	$ 161,460	-$ 103,664
Communications Equipment	$ 30,622	$ -	$ -	$ 30,622	-$ 30,481	-$ 141	$ -	-$ 30,622	-$ 0	$ 30,622	-$ 30,552
System Supervisor Equipment	$ -	$ 425,000	$ -	$ 425,000	$ -	-$ 10,625	$ -	-$ 10,625	$ 414,375	$ 212,500	-$ 5,313
Deferred Revenue5	-$ 3,021,465	-$ 480,000	$ -	-$ 3,501,465	$ 281,631	$ 77,292	$ -	$ 358,923	-$ 3,142,542	-$ 3,261,465	$ 320,277
TOTAL PP&E FOR RATE BASE	$ 18,098,019	$ 1,608,929	-$ 6,240	$ 19,700,708	-$ 4,723,793	-$ 607,720	$ 401,876	-$ 4,929,636	$ 14,771,072	$ 18,899,363	-$ 4,826,714
WIP	$ 100,000		-$ 100,000	$ -							
Deferred Revenue (Fully Allocated)						$ 77,292					
TOTAL	$ 17,998,019	$ 1,608,929	$ 93,760	$ 19,700,708	-$ 4,723,793	-$ 685,012	$ 401,876	-$ 5,006,928	$ 14,693,780	$ 18,849,363	-$ 4,865,360

This section outlines RSL's capital expenditure plan across all programs for the historical period, bridge year, test year, and planning horizon. Table 10 summarizes total capital expenditures by program, including System Access, System Renewal, System Service, and General Plant.

Detailed project-level continuity tables are provided immediately following, showing capital expenditures by project and by year. The detailed tables reconcile directly to the summary presented in Table 10 and to the capital expenditure schedules included in Appendix 2-AA.

Table 10 – Summary of Projects (App 2-AA)

Program	2022	2023	2024	2025	2026 Bridge	2027 Test	2028	2029	2030	2031
System Access (Net)	185,846	386,611	33,763	506,881	1,795,458	(172,970)	1,430,583	1,195,493	1,075,000	1,075,000
System Renewal (Net)	221,965	75,497	524,863	443,588	677,000	637,670	1,006,470	1,264,316	946,322	1,262,597
System Service (Net)	334,397	968,787	137,627	123,800	770,000	1,079,229	0	0	0	0
General Plant (Net)	62,452	210,064	26,576	53,309	1,290,628	65,000	0	0	0	0
Total Capital	804,660	1,640,959	722,830	1,127,577	4,533,086	1,608,929	2,437,053	2,459,809	2,021,322	2,337,597

Table 11 – Gross Fixed Asset Additions – System Access (App 2-AA)

Project Name	2022	2023	2024	2025	2026 Bridge	2027 Test	2028	2029	2030	2031
Replacement Transformers	0	0	0	250,210	0	0	0	0	0	0
Misc - 2400	0	0	0	21,875	0	0	0	0	0	0
Tesla Morrisburg - 2401	0	0	22,713	100,663	0	0	0	0	0	0
Morrisburg Housing - 2403	0	0	11,040	93,561	0	0	0	0	0	0
Iroquois Transformer Housing - 2404	0	0	0	70,734	0	0	0	0	0	0
Safavieh Warehouse - 2410	0	0	0	112,291	0	0	0	0	0	0
James Street - 2416	0	0	2,890	3,095	0	0	0	0	0	0
Misc - 2500	0	0	0	114,767	0	0	0	0	0	0
Anytime Fitness - 2502	0	0	0	6,359	0	0	0	0	0	0
Westport - 2504	0	0	0	16,249	0	0	0	0	0	0
High School Seaway - 2507	0	0	0	119,189	0	0	0	0	0	0
Meter Replacement Plan 2026	0	0	0	0	0	0	0	0	0	0
Iroquois Station MS2 – Capacity (Valecraft, Seaway, Stefanos)	0	0	0	0	950,000	0	0	0	0	0
Iroquois – Valecraft Phase 1 Homes	0	0	0	0	505,989	0	0	0	0	0
Iroquois – Valecraft Phase 2 Homes	0	0	0	0	0	120,493	240,986	120,493	0	0
Valecraft Apartments	0	0	0	0	264,635	58,012	114,597	0	0	0
Watercolours Phase 3	0	0	0	0	231,304	0	0	0	0	0
Prescott Town – Habitat for Humanity	0	0	0	0	3,874	0	0	0	0	0

Prescott Grocery Store – Rosbay	0	0	0	0	91,656	0	0	0	0	0
Dundas Street Resurfacing	0	0	0	0	0	128,525	0	0	0	0
Prescott Madison Apartments – 2 Claxton	0	0	0	0	0	0	0	0	0	0
Prescott Edward 44kV for PLTC	0	0	0	0	300,000	0	0	0	0	0
Meter Replacement Plan 2027	0	0	0	0	0	0	0	0	0	0
Iroquois – Valecraft Phase 2 Homes (duplicate)	0	0	0	0	0	0	0	0	0	0
Misc - 2201	108,138	0	0	0	0	0	0	0	0	0
Misc - 2301	0	54,893	19,603	0	0	0	0	0	0	0
Westport Landark Construction	8,646	0	0	0	0	0	0	0	0	0
Ross Video	19,958	1,554	1,667	0	0	0	0	0	0	0
Prescott Arena	124,703	35,912	0	0	0	0	0	0	0	0
Westport Phase II Subdivision	35,242	160,897	525	0	0	0	0	0	0	0
Miscellaneous	2,346	0	0	0	0	0	696,000	696,000	696,000	696,000
Wellington School	20,894	0	0	0	0	0	0	0	0	0
MacEwens Edward Street	22,486	44,026	65,655	0	0	0	0	0	0	0
Miscellaneous	2,712	0	0	0	0	0	0	0	0	0
Dollarama Prescott	20,935	0	0	0	0	0	0	0	0	0
Miscellaneous	1,665	0	0	0	0	0	0	0	0	0
Miscellaneous	0	65	0	0	0	0	0	0	0	0
Wellington School	0	8,538	0	0	0	0	0	0	0	0
Dollarama Prescott	0	45,544	0	0	0	0	0	0	0	0
McDonald's Line Extension	0	10,817	0	0	0	0	0	0	0	0
Caldwell Drive Iroquois	0	4,019	0	0	0	0	0	0	0	0
Prescott Arena Fiber Line	0	14,900	0	0	0	0	0	0	0	0
T Coville	0	0	0	16,386	0	0	0	0	0	0
Quality Inn Hotel Prescott	0	5,446	67,629	0	0	0	0	0	0	0
Harland Veinotte	0	0	4,285	0	0	0	0	0	0	0
110 King Street - 2412	0	0	4,856	0	0	0	0	0	0	0
Madison Mulder Churchill - 2406	0	0	13,519	0	0	0	0	0	0	0

Project Name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
System Access Gross Expenditures	367,726	386,611	214,383	925,378	2,347,458	307,030	1,051,583	816,493	696,000	696,000
System Access Capital Contributions	181,880	0	180,620	418,498	552,000	480,000	-379,000	-379,000	-379,000	-379,000
System Access Net Sub-Total	185,846	386,611	33,763	506,881	1,795,458	(172,970)	1,430,583	1,195,493	1,075,000	1,075,000

Table 12 – Gross Fixed Asset Additions – System Renewal (App 2-AA)

Project Name	2022	2023	2024	2025	2026 Bridge	2027 Test	2028	2029	2030	2031
Fort Town Drive Pole Trans 3 - Safety	0	0	0	0	105,000	0	0	0	0	0
Kingston Cre Pole Trans - Safety	0	0	0	0	180,000	0	0	0	0	0
Morrisburg Plaza Kiosk Replacements	0	0	0	0	260,000	0	0	0	0	0
Iroquois Plaza Kiosk Replacements	0	0	0	0	0	259,898	0	0	0	0
Replace Air Break Switch with S&C Load Break	0	0	0	0	100,000	0	0	0	0	0
Station Resurfacing - Cardinal - MS1	0	0	0	0	0	20,000	0	0	0	0
Station Resurfacing - Iroquois - MS1	0	0	0	0	0	20,000	0	0	0	0
Station Resurfacing - Morrisburg - MS1 and MS2 Repair	0	0	0	0	0	2,500	0	0	0	0
Station Resurfacing - Prescott MS2, MS3, MS4	0	0	0	0	0	12,500	0	0	0	0
2221	0	0	0	3,551	0	0	0	0	0	0
2313	0	0	0	1,574	0	0	0	0	0	0
Church Street Iroquois - 2404	0	0	0	65,100	0	0	0	0	0	0
PCB - 2413	0	0	150	197,153	0	0	0	0	0	0
Northern Cables - 2419	0	0	0	2,106	0	0	0	0	0	0
PCB - 2501	0	0	0	135,529	0	0	0	0	0	0
Pole Hit - 2503	0	0	0	7,521	0	0	0	0	0	0
Pole Hit - 2505	0	0	0	1,365	0	0	0	0	0	0
Storms - 2506	0	0	0	9,002	0	0	0	0	0	0
Fire - 2508	0	0	0	9,171	0	0	0	0	0	0
Pole Replacements - 2510	0	0	0	11,516	0	0	0	0	0	0
Prescott Live Front - Kingston Cres - Safety	0	0	0	0	0	0	0	0	0	0
Misc. System Renewal Projects	0	0	0	0	0	0	0	0	0	0
MacKenzie Rd Prescott	0	0	11,203	0	0	0	0	0	0	0
PCB Transformers - 2315	0	0	17,327	0	0	0	0	0	0	0
Miscellaneous - 2400	0	0	206,530	0	0	0	0	0	0	0
Pole Replacements - Sir James - 2407	0	0	4,919	0	0	0	0	0	0	0
Church St Iroquois	0	0	127,850	0	0	0	0	0	0	0
Reid Street Cardinal	0	0	80,770	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - South Square	0	1,163	0	0	0	0	0	0	0	0
Pole Replacements - Fifth Street St. Lawrence	0	13,655	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - High Street Small Conductor	0	1,343	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - Morrisburg	0	107,511	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - Morrisburg 2	0	10,239	1,765	0	0	0	0	0	0	0

2023 Storms	0	3,316	0	0	0	0	0	0	0	0
Fibre to the Home - Lions Bell	0	28,941	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - Cardinal - 2313	0	855	6,956	0	0	0	0	0	0	0
Meter Replacements - 1860	55,012	42,875	67,393	0	32,000	274,700	0	0	0	0
1014A Work - 2022	36,362	0	0	0	0	0	0	0	0	0
Misc 2021 Jobs - 2101	0	0	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - McKenzie Road	48,744	22,291	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - F	0	0	0	0	0	0	0	0	0	0
Transformer Replacements	2,284	0	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH)	201,499	0	0	0	0	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH)	17,950	0	0	0	0	0	0	0	0	0
Pole Replacements	12,264	0	0	0	0	48,072	0	0	0	0
Dundas Street Rebuild – Bridge to Benson	0	0	0	0	0	0	157,873	0	0	0
Fifth Street Rear Lot Conversion	0	0	0	0	0	0	190,392	0	0	0
Caldwell Drive Rear Lot Conversion	0	0	0	0	0	0	0	124,215	0	0
Maple Street Rear Lot Conversion	0	0	0	0	0	0	0	208,532	0	0
Orchard Way Rear Lot Conversion	0	0	0	0	0	0	0	268,664	0	0
Benson Street – Rear Lot Conversion	0	0	0	0	0	0	0	0	59,494	0
Joseph Street – Small Conductor	0	0	0	0	0	0	0	0	106,748	0
Perry Street – Small Conductor	0	0	0	0	0	0	0	0	66,175	0
Alexander The Square – Rear Lot Conversion	0	0	0	0	0	0	0	0	0	116,075
Churchill E Extension – Rear Lot Conversion	0	0	0	0	0	0	0	0	0	159,252
Roberta Cres – Rear Lot Conversion	0	0	0	0	0	0	0	0	0	313,570
Commercial and Residential Metering	0	0	0	0	0	0	358,000	358,000	534,000	534,000
PME	0	0	0	0	0	0	300,205	304,905	179,905	139,700
Miscellaneous	177,491	6,649	0	0	0	0	0	0	0	0
Miscellaneous - Variance	0	0	0	0	0	0	0	0	0	0

Project Name	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
System Renewal Gross Expenditures	551,605	238,838	524,863	443,588	677,000	637,670	1,006,470	1,264,316	946,322	1,262,597
System Renewal Capital Contributions	329,640	163,342	0	0	0	0	0	0	0	0
Net Sub-Total	221,965	75,497	524,863	443,588	677,000	637,670	1,006,470	1,264,316	946,322	1,262,597

Table 13 – Gross Fixed Asset Additions – System Service (App 2-AA)

Project Name	2022	2023	2024	2025	2026 Bridge	2027 Test	2028	2029	2030	2031
Cardinal - East Street - Dundas to John - Load Balancing	0	0	0	0	0	119,229	0	0	0	0
NRCAN - Reclosures & SCADA 2026	0	0	0	0	0	0	0	0	0	0
Cardinal - New Transformer + Fan	0	0	0	0	450,000	0	0	0	0	0
NRCan - SCADA - Iroquois	0	0	0	0	320,000	0	0	0	0	0
NRCan - SCADA - Cardinal	0	0	0	0	0	480,000	0	0	0	0
NRCan - SCADA - Prescott MS2	0	0	0	0	0	160,000	0	0	0	0
NRCan - SCADA - Prescott MS3	0	0	0	0	0	320,000	0	0	0	0
Replacement Meters	0	0	0	80,338	0	0	0	0	0	0
Next Polymers - 2418	0	0	0	43,461	0	0	0	0	0	0
MS2 Morrisburg Relocation	314,258	0	0	0	0	0	0	0	0	0
MS1 Upgrade Iroquois	12,225	0	0	0	0	0	0	0	0	0
MS1 Upgrade Morrisburg	0	0	0	0	0	0	0	0	0	0
MS2 Morrisburg Relocation	0	849,682	0	0	0	0	0	0	0	0
MS1 Upgrade Iroquois	0	28,175	0	0	0	0	0	0	0	0
MS1 Upgrade Morrisburg	0	7,142	0	0	0	0	0	0	0	0
Cardinal Hwy 2 Rebuild	0	83,788	0	0	0	0	0	0	0	0
MS2 Morrisburg Relocation	0	0	1,784	0	0	0	0	0	0	0
MS1 Upgrade Morrisburg	0	0	73,861	0	0	0	0	0	0	0
Iroquois Transformer Cty Rd 2 (Ferrante) - 2404	0	0	57,823	0	0	0	0	0	0	0
Transformer Replacements	0	0	0	0	0	0	0	0	0	0
Miscellaneous	7,913	0	0	0	0	0	0	0	0	0
Carmen Rd Rebuild - 2415	0	0	4,159	0	0	0	0	0	0	0

Project Name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
System Service Gross Expenditures	334,397	968,787	137,627	123,800	770,000	1,079,229	0	0	0	0
System Service Capital Contributions	0	0	0	0	0	0	0	0	0	0
Net Sub-Total	334,397	968,787	137,627	123,800	770,000	1,079,229	0	0	0	0

Table 14 – Gross Fixed Asset Additions – General Plant (App 2-AA)

Project Name	2022	2023	2024	2025	2026 Bridge	2027 Test	2028	2029	2030	2031
Office Furniture (4) and Facilities (15) 2026	0	0	0	0	19,000	19,000	0	0	0	0
Computer Hardware - 1920	19,583	6,308	8,625	4,339	16,000	16,000	0	0	0	0
Tools - 1940	4,601	10,370	10,952	16,817	15,000	15,000	0	0	0	0
Computer Software	38,268	66,150	7,000	0	15,000	15,000	0	0	0	0
Vehicle - 1920	0	127,236	0	32,153	1,225,628	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0	0	0	0	0
Vehicle ¾ Ton	0	0	0	0	0	0	95,000	0	0	0
Rear Lot Derrick	0	0	0	0	0	0	307,000	0	0	0
Digger	0	0	0	0	0	0	0	0	0	700,000

Project Name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
General Plant Gross Expenditures	62,452	210,064	26,576	53,309	1,290,628	65,000	0	0	0	0
General Plant Capital Contributions	0	0	0	0	0	0	0	0	0	0
Net Sub-Total	62,452	210,064	26,576	53,309	1,290,628	65,000	0	0	0	0

2.3 DEPRECIATION EXPENSES

In accordance with the July 17, 2012, letter from the Board on Regulatory accounting policy direction regarding changes to depreciation expense and capitalization policies and as such, RLS has adopted the Kinetrics proposed useful lives and componentization on January 1, 2015.

RSL confirms that there have been no changes to depreciation methods, asset service lives, or capitalization practices since the last rebasing application. Depreciation continues to be calculated on a straight-line basis in accordance with the OEB-approved useful lives.

Continuity Statements of the historical and forecasted depreciation expenses are presented on the next page and are filed in Excel format along with this application.

RLS confirms that it has applied the half-year rule to compute the net book value of Property, Plant and Equipment, and General Plant in the rate base. Under the half-year rule, acquisitions and investments made during the year are amortized, assuming they entered service at the year's mid-point.

RLS's Depreciation rates and Capitalization Policy are presented below.

Accumulated Depreciation

RLS has adopted depreciation rates based on the Kinectrics Asset Depreciation Study, which can be found at the following secure link:

https://www.oeb.ca/oeb/_Documents/EB-2010-0178/Kinetrics-418033-OEB%20Asset%20Amortization-%20Final%20Rep.pdf

The depreciation rates, RLS's capitalization policy, methodology, and depreciation expenses continuity schedules are presented in section 2.2.3.

Below are the Fixed Asset Continuity Schedules for 2022 to 2027

Depreciation Policy for Fixed Assets

1. **Purpose:** This policy outlines the guidelines for the depreciation of fixed assets owned by the company. Depreciation is the systematic allocation of the cost of an asset over its useful life. The purpose of this policy is to ensure that all assets are depreciated in accordance with their useful life and that financial statements reflect the accurate value of assets.

2. **Scope:** This policy applies to all fixed assets, including computer software, poles, towers, fixtures, conductors, devices, meters, office furniture, equipment, and more, as described below.

3. **Depreciation Method:** All assets are depreciated using the straight-line method, where an equal amount of depreciation is charged each year over the useful life of the asset. The useful life is determined based on historical experience, industry standards, and the nature of the asset.

4. **Depreciation Start Date:** Depreciation begins when the asset is available for use, which is the date it is put into service. If an asset is acquired during the fiscal year, the depreciation is prorated for the remaining months of the year.

5. **Residual Value:** In most cases, assets are depreciated assuming no residual value. However, if an asset is expected to have a significant residual value at the end of its useful life, this will be estimated and deducted from the depreciable base.

6. **Asset Categories and Useful Life:** The following table outlines the various categories of assets and their respective useful lives:

The proposed useful lives are unchanged from the Applicant's 2022 Cost of Service application and remain within OEB-prescribed ranges. The Applicant has reviewed the service lives and determined that no updates are required, as they continue to reflect asset performance.

Table 15 - Depreciation Rates (2-BB)

USoA Account	Description	Asset Category	Proposed Useful Life (Years)	Depreciation Rate	Within OEB Range
1830	Poles, Towers & Fixtures – Fully Dressed Wood	Overhead Poles	45	2%	Yes
1835	Overhead Conductors & Devices	Overhead Conductors	60	2%	Yes
1850	Line Transformers	OH & UG Transformers	45	2%	Yes
1820	Distribution Station Equipment – Substations	Power Transformers	45	2%	Yes
1820	Distribution Station Equipment – Switchgear	Metal Clad Switchgear	40	3%	Yes
1845	Underground Conductors & Devices	Primary UG Cables	40	3%	Yes
1855	Services	Secondary Cables	60	2%	Yes
1840	Underground Conduit	UG Conduit & Foundations	50	2%	Yes

Table 16 – Depreciation Expenses 2022 (App 2-C)

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)		DEPRECIATION EXPENSE CALCULATIONS										
Acct #	Description	Opening Balance for 2022	Less Fully Depr.	Additions for 2022	Disposals for 2022	Net amount for Depr.	Remaining UL	Remaining Depr.Rate	Depr Exp.	Depr Exp from Col J	Var	UL
1611	Computer Software (Formally known as Account 1925)	$ 374,476	$ 209,944	$ 38,268	$ -	$ 183,666	5	20%	$ 36,149	$ 36,149	$ -	5
1805	Land	$ 91,567	$ -	$ -	$ -	$ 91,567		0%	$ -	$ -	$ -	0
1808	Buildings	$ 98,143	$ -	$ -	$ -	$ 98,143	45	8%	$ 2,184	$ 2,184	$ -	45
1820	Distribution Station Equipment <50 kV	$ 1,340,639	$ -	$ -	$ -	$ 1,340,639	33	3%	$ 41,124	$ 41,124	$ -	40-45
1830	Poles, Towers & Fixtures	$ 1,825,788	$ -	$ 539,891	-$ 6,449	$ 2,102,182	43	2%	$ 48,796	$ 48,796	$ -	45
1835	Overhead Conductors & Devices	$ 1,969,828	$ -	$ 242,687	$ -	$ 2,091,172	54	2%	$ 38,820	$ 38,820	$ -	60
1840	Underground Conduit	$ 131,365	$ -	$ 42,056	$ -	$ 152,393	48	2%	$ 3,158	$ 3,158	$ -	50
1845	Underground Conductors & Devices	$ 853,502	$ -	$ 70,226	$ -	$ 888,615	34	3%	$ 26,231	$ 26,231	$ -	40
1850	Line Transformers	$ 1,272,219	$ -	$ 255,443	-$ 687	$ 1,400,628	41	2%	$ 34,455	$ 34,455	$ -	45
1855	Services (Overhead & Underground)	$ 436,908	$ -	$ 43,622	$ -	$ 458,719	54	2%	$ 8,490	$ 8,490	$ -	60
1860	Meters	$ 122,715	$ -	$ -	$ -	$ 122,715	12	8%	$ 10,037	$ 10,037	$ -	15
1860	Meters (Smart Meters)	$ 1,139,048	$ 3,260	$ 59,802	$ -	$ 1,165,689	13	8%	$ 93,164	$ 93,164	$ -	25
1910	Leasehold Improvements	$ 15,718	$ 3,959	$ -	$ -	$ 11,759	10	10%	$ 1,176	$ 1,176	$ -	10
1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ 241,384	$ 142,205	$ 18,184	$ -	$ 108,271	5	18%	$ 19,993	$ 19,993	$ -	5
1930	Transportation Equipment	$ 917,614	$ 438,365	$ -	$ -	$ 479,249	7	14%	$ 66,421	$ 66,421	$ -	8-15
1940	Tools, Shop & Garage Equipment	$ 96,220	$ 16,712	$ 4,601	$ -	$ 81,808	10	10%	$ 8,201	$ 8,201	$ -	10
1955	Communications Equipment	$ 29,223	$ 25,511	$ 1,399	$ -	$ 4,412	5	20%	$ 882	$ 882	$ -	5
2440	Deferred Revenue5	-$ 1,195,486	$ -	-$ 511,520	$ -	-$ 1,451,246	46	2%	-$ 31,887	-$ 31,887	$ -	38
	TOTAL PP&E FOR RATE BASE	$ 9,760,871	$ 839,956	$ 804,660	-$ 7,135	$ 9,330,381	464	135%	$ 407,394	$ 407,394	$ -	
2055	WIP											
	Deferred Revenue (Fully Allocated)											
	TOTAL	$ 19,521,743	$ 1,679,912	$ 1,609,320	-$ 14,271	$ 18,660,761	928.47	$ 3	$ 814,788	$ 814,788	$ -	

Table 17 – Depreciation Expenses 2023 (App 2-C)

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)		DEPRECIATION EXPENSE CALCULATIONS										
Acct #	Description	Opening Balance for 2023	Less Fully Depr.	Additions for 2023	Disposals for 2023	Net amount for Depr.	Remaining UL	Depr.Rate	Depr Exp.	Depr Exp from Col J	Var	UL
1611	Computer Software (Formally known as Account 1925)	$ 412,744	$ 215,784	$ 66,150	$ -	$ 230,035	6	17%	$ 38,978	$ 38,978	$ -	5
1805	Land	$ 91,567	$ -	$ -	$ -	$ 91,567		0%	$ -	$ -	$ -	0
1808	Buildings	$ 98,143	$ -	$ 19,950	$ -	$ 108,118	42	2%	$ 2,583	$ 2,583	$ -	45
1820	Distribution Station Equipment <50 kV	$ 1,340,639	$ -	$ -	$ -	$ 1,340,639	33	3%	$ 41,124	$ 41,124	$ -	40-45
1830	Poles, Towers & Fixtures	$ 2,359,231	$ -	$ 491,224	-$ 242	$ 2,605,084	45	2%	$ 58,010	$ 58,010	$ -	45
1835	Overhead Conductors & Devices	$ 2,212,515	$ -	$ 176,724	$ -	$ 2,300,878	54	2%	$ 42,315	$ 42,315	$ -	60
1840	Underground Conduit	$ 173,421	$ -	$ 72,139	$ -	$ 209,491	49	2%	$ 4,300	$ 4,300	$ -	50
1845	Underground Conductors & Devices	$ 923,728	$ -	$ 139,060	$ -	$ 993,258	36	3%	$ 27,729	$ 27,729	$ -	40
1850	Line Transformers	$ 1,526,976	$ -	$ 601,510	-$ 365	$ 1,828,095	42	2%	$ 43,963	$ 43,963	$ -	45
1855	Services (Overhead & Underground)	$ 480,530	$ -	$ 50,753	$ -	$ 505,907	55	2%	$ 9,277	$ 9,277	$ -	60
1860	Meters	$ 122,715	$ -	$ -	$ -	$ 122,715	12	8%	$ 10,161	$ 10,161	$ -	15
1860	Meters (Smart Meters)	$ 1,198,850	$ 3,260	$ 42,875	$ -	$ 1,217,028	13	8%	$ 94,172	$ 94,172	$ -	25
1910	Leasehold Improvements	$ 15,718	$ 3,959	$ -	$ -	$ 11,759	10	10%	$ 1,176	$ 1,176	$ -	10
1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ 259,568	$ 158,822	$ 6,308	$ -	$ 103,900	5	18%	$ 19,164	$ 19,164	$ -	5
1930	Transportation Equipment	$ 917,614	$ 381,309	$ 127,236	-$ 89,069	$ 688,993	9	11%	$ 73,644	$ 73,644	$ -	8-15
1940	Tools, Shop & Garage Equipment	$ 100,821	$ 18,761	$ 10,370	$ -	$ 87,245	11	9%	$ 8,269	$ 8,269	$ -	10
1955	Communications Equipment	$ 30,622	$ 25,511	$ -	$ -	$ 5,111	5	20%	$ 1,022	$ 1,022	$ -	5
2440	Deferred Revenue5	-$ 1,707,006	$ -	-$ 163,342	$ -	-$ 1,788,677	46	2%	-$ 39,291	-$ 39,291	$ -	38
	TOTAL PP&E FOR RATE BASE	$ 10,558,396	$ 807,406	$ 1,640,959	-$ 89,676	$ 10,661,145	471	122%	$ 436,595	$ 436,595	$ -	
2055	WIP											
	Deferred Revenue (Fully Allocated)											
	TOTAL	$ 10,558,396	$ 807,406	$ 1,640,959	-$ 89,676	$ 10,661,145	$ 471	$ 1	$ 436,595	$ 436,595	$ -	

Table 18 – Depreciation Expenses 2024 (App 2-C)

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)		DEPRECIATION EXPENSE CALCULATIONS										
Acct #	Description	Opening Balance for 2024	Less Fully Depr.	Additions for 2024	Disposals for 2024	Net amount for Depr.	Remaining UL	Depr.Rate	Depr Exp.	Depr Exp from Col J	Var	UL
1611	Computer Software (Formally known as Account 1925)	$ 478,894	$ 219,921	$ 7,000	$ -	$ 262,473	5	21%	$ 54,058	$ 54,058	$ -	5
1805	Land	$ 91,567	$ -	$ -	$ -	$ 91,567		0%	$ -	$ -	$ -	0
1808	Buildings	$ 118,093	$ -	$ -	$ -	$ 118,093	40	3%	$ 2,982	$ 2,982	$ -	45
1820	Distribution Station Equipment <50 kV	$ 1,340,639	$ -	$ 52,185	$ -	$ 1,366,731	33	3%	$ 41,704	$ 41,704	$ -	40-45
1830	Poles, Towers & Fixtures	$ 2,850,213	$ -	$ 269,021	-$ 1,043	$ 2,985,766	43	2%	$ 68,654	$ 68,654	$ -	45
1835	Overhead Conductors & Devices	$ 2,389,240	$ -	$ 31,596	$ -	$ 2,405,038	55	2%	$ 44,051	$ 44,051	$ -	60
1840	Underground Conduit	$ 245,560	$ -	$ 51,262	$ -	$ 271,191	49	2%	$ 5,534	$ 5,534	$ -	50
1845	Underground Conductors & Devices	$ 1,062,789	$ -	$ 61,138	$ -	$ 1,093,358	34	3%	$ 32,467	$ 32,467	$ -	40
1850	Line Transformers	$ 2,128,121	$ -	$ 258,214	-$ 703	$ 2,257,931	42	2%	$ 53,474	$ 53,474	$ -	45
1855	Services (Overhead & Underground)	$ 531,284	$ -	$ 77,030	$ -	$ 569,799	55	2%	$ 10,341	$ 10,341	$ -	60
1860	Meters	$ 122,715	$ 22,675	$ -	$ -	$ 100,040	12	9%	$ 8,650	$ 8,650	$ -	15
1860	Meters (Smart Meters)	$ 1,241,726	$ 1,989	$ 76,427	$ -	$ 1,277,950	17	6%	$ 75,979	$ 75,979	$ -	25
1910	Leasehold Improvements	$ 15,718	$ 3,959	$ -	$ -	$ 11,759	10	10%	$ 1,176	$ 1,176	$ -	10
1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ 265,876	$ 174,984	$ 8,625	$ -	$ 95,204	5	18%	$ 17,577	$ 17,577	$ -	5
1930	Transportation Equipment	$ 955,781	$ 381,805	$ -	$ -	$ 573,976	7	15%	$ 86,193	$ 86,193	$ -	8-15
1940	Tools, Shop & Garage Equipment	$ 111,190	$ 18,761	$ 10,952	$ -	$ 97,905	12	8%	$ 8,029	$ 8,029	$ -	10
1955	Communications Equipment	$ 30,622	$ 25,511	$ -	$ -	$ 5,111	5	20%	$ 1,022	$ 1,022	$ -	5
2440	Deferred Revenue5	-$ 1,870,348	$ -	-$ 180,620	$ -	-$ 1,960,658	46	2%	-$ 43,069	-$ 43,069	$ -	38
	TOTAL PP&E FOR RATE BASE	$ 12,109,679	$ 849,605	$ 722,830	-$ 1,746	$ 11,623,235	469	128%	$ 468,822	$ 468,822	$ -	
2055	WIP											
	Deferred Revenue (Fully Allocated)											
	TOTAL	$ 12,109,679	$ 849,605	$ 722,830	-$ 1,746	$ 11,623,235	468.50	$ 1	$ 468,822	$ 468,822	$ -	

Table 19 – Depreciation Expenses 2025 (App 2-C)

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)		DEPRECIATION EXPENSE CALCULATIONS										
Acct #	Description	Opening Balance for 2025	Less Fully Depr.	Additions for 2025	Disposals for 2025	Net amount for Depr.	Remaining UL	Depr.Rate	Depr Exp.	Depr Exp from Col J	Var	UL
1611	Computer Software (Formally known as Account 1925)	$ 485,894	$ 270,438	$ -	$ -	$ 215,456	7	15%	$ 32,688	$ 32,688	$ -	5
1805	Land	$ 91,567	$ -	$ -	$ -	$ 91,567		0%	$ -	$ -	$ -	0
1808	Buildings	$ 118,093	$ -	$ -	$ -	$ 118,093	40	3%	$ 2,982	$ 2,982	$ -	45
1820	Distribution Station Equipment <50 kV	$ 1,392,824	$ -	$ 16,511	$ -	$ 1,401,079	33	3%	$ 42,467	$ 42,467	$ -	40-45
1830	Poles, Towers & Fixtures	$ 3,118,191	$ -	$ 138,370	-$ 1,759	$ 3,189,134	44	2%	$ 72,820	$ 72,820	$ -	45
1835	Overhead Conductors & Devices	$ 2,420,836	$ -	$ 50,602	$ -	$ 2,446,137	54	2%	$ 45,094	$ 45,094	$ -	60
1840	Underground Conduit	$ 296,822	$ -	$ 3,630	$ -	$ 298,637	49	2%	$ 6,083	$ 6,083	$ -	50
1845	Underground Conductors & Devices	$ 1,123,927	$ -	$ 44,530	$ -	$ 1,146,191	35	3%	$ 32,670	$ 32,670	$ -	40
1850	Line Transformers	$ 2,385,632	$ -	$ 1,019,463	-$ 3,901	$ 2,899,265	43	2%	$ 67,670	$ 67,670	$ -	45
1855	Services (Overhead & Underground)	$ 608,314	$ -	$ 98,250	$ -	$ 657,438	56	2%	$ 11,802	$ 11,802	$ -	60
1860	Meters	$ 122,715	$ 22,675	$ -	$ -	$ 100,040	12	9%	$ 8,650	$ 8,650	$ -	15
1860	Meters (Smart Meters)	$ 1,318,153	$ 504,857	$ 121,411	$ -	$ 874,001	17	6%	$ 52,808	$ 52,808	$ -	25
1910	Leasehold Improvements	$ 15,718	$ 3,959	$ -	$ -	$ 11,759	10	10%	$ 1,176	$ 1,176	$ -	10
1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ 274,501	$ 189,623	$ 4,339	$ -	$ 87,047	6	16%	$ 14,266	$ 14,266	$ -	5
1930	Transportation Equipment	$ 955,781	$ 383,051	$ 32,153	$ -	$ 588,807	9	11%	$ 63,988	$ 63,988	$ -	8-15
1940	Tools, Shop & Garage Equipment	$ 122,142	$ 37,993	$ 16,817	$ -	$ 92,558	10	10%	$ 9,070	$ 9,070	$ -	10
1955	Communications Equipment	$ 30,622	$ 25,511	$ -	$ -	$ 5,111	5	20%	$ 1,022	$ 1,022	$ -	5
2440	Deferred Revenue5	-$ 2,050,968	$ -	-$ 418,498	$ -	-$ 2,260,217	44	2%	-$ 50,886	-$ 50,886	$ -	38
	TOTAL PP&E FOR RATE BASE	$ 12,830,763	$ 1,438,107	$ 1,127,578	-$ 5,660	$ 11,962,104	473	118%	$ 414,371	$ 414,371	$ -	
2055	WIP											
	Deferred Revenue (Fully Allocated)											
	TOTAL	$ 12,830,763	$ 1,438,107	$ 1,127,578	-$ 5,660	$ 11,962,104	$ 473	$ 1	$ 414,371	$ 414,371	$ -	

Table 20 – Depreciation Expenses 2026 (App 2-C)

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)		DEPRECIATION EXPENSE CALCULATIONS										
Acct #	Description	Opening Balance for 2026	Less Fully Depr.	Additions for 2026	Disposals for 2026	Net amount for Depr.	Service Life	Depr.Rate	Depr Exp.	Depr Exp from Col J	Var	UL
1611	Computer Software (Formally known as Account 1925)	$ 485,894	$ 374,476	$ 15,000	$ -	$ 118,918	4	22%	$ 26,683	$ 26,683	$ -	5
1805	Land	$ 91,567	$ -	$ 100,000	$ -	$ 141,567		0%	$ -	$ -	$ -	0
1808	Buildings	$ 118,093	$ -	$ -	$ -	$ 118,093	40	3%	$ 2,982	$ 2,982	$ -	45
1820	Distribution Station Equipment <50 kV	$ 1,409,334	$ -	$ 1,720,000	$ -	$ 2,269,334	37	3%	$ 61,762	$ 61,762	$ -	40-45
1830	Poles, Towers & Fixtures	$ 3,254,802	$ -	$ 259,842	-$ 1,847	$ 3,386,569	44	2%	$ 77,603	$ 77,603	$ -	45
1835	Overhead Conductors & Devices	$ 2,471,438	$ -	$ 160,418	$ -	$ 2,551,647	57	2%	$ 44,895	$ 44,895	$ -	60
1840	Underground Conduit	$ 300,452	$ -	$ 86,852	$ -	$ 343,878	49	2%	$ 6,988	$ 6,988	$ -	50
1845	Underground Conductors & Devices	$ 1,168,456	$ -	$ 247,444	$ -	$ 1,292,178	36	3%	$ 36,320	$ 36,320	$ -	40
1850	Line Transformers	$ 3,401,194	$ -	$ 1,075,782	-$ 4,096	$ 3,943,181	43	2%	$ 90,951	$ 90,951	$ -	45
1855	Services (Overhead & Underground)	$ 706,563	$ -	$ 125,336	$ -	$ 769,231	56	2%	$ 13,665	$ 13,665	$ -	60
1860	Meters	$ 122,715	$ 30,404	$ -	$ -	$ 92,311	11	9%	$ 8,650	$ 8,650	$ -	15
1860	Meters (Smart Meters)	$ 1,439,564	$ 504,857	$ 18,784	$ -	$ 944,099	16	6%	$ 57,481	$ 57,481	$ -	25
1910	Leasehold Improvements	$ 15,718	$ -	$ 19,000	$ -	$ 25,218	12	8%	$ 2,126	$ 2,126	$ -	10
1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ 278,840	$ 221,057	$ 16,000	$ -	$ 65,783	6	17%	$ 11,124	$ 11,124	$ -	5
1930	Transportation Equipment	$ 987,934	$ 356,572	$ 1,225,628	-$ 381,805	$ 1,625,982	16	6%	$ 101,066	$ 101,066	$ -	8-15
1940	Tools, Shop & Garage Equipment	$ 138,960	$ 41,432	$ 15,000	$ -	$ 105,028	13	8%	$ 8,024	$ 8,024	$ -	10
1955	Communications Equipment	$ 30,622	$ 29,223	$ -	$ -	$ 1,399	2	47%	$ 651	$ 651	$ -	5
2440	Deferred Revenue5	-$ 2,469,465	$ -	-$ 552,000	$ -	-$ 2,745,465	44	2%	-$ 62,874	-$ 62,874	$ -	38
	TOTAL PP&E FOR RATEMAKING	$ 13,952,681	$ 1,558,021	$ 4,533,086	-$ 387,748	$ 15,048,950	486	144%	$ 488,097	$ 488,097	$ -	
2055	WIP											
	Deferred Revenue (Fully Allocated)											
	TOTAL	$ 13,952,681	$ 1,558,021	$ 4,533,086	-$ 387,748	$ 15,048,950	$ 486	$ 1	$ 488,097	$ 488,097	$ -	

Table 21 – Depreciation Expenses 2027 (App 2-C)

FIXED ASSET CONTINUITY SCHEDULE (RRR 2.1.5.8)		DEPRECIATION EXPENSE CALCULATIONS										
Acct #	Description	Opening Balance for 2027	Less Fully Depr.	Additions for 2027	Disposals for 2027	Net amount for Depr.	Remaining UL	Depr.Rate	Depr Exp.	Depr Exp from Col J	Var	UL
1611	Computer Software (Formally known as Account 1925)	$ 500,894	$ 374,476	$ 15,000	$ -	$ 133,918	5	18%	$ 24,356	$ 24,356	$ -	5
1805	Land	$ 191,567	$ -	$ 55,000	$ -	$ 219,067		0%	$ -	$ -	$ -	0
1808	Buildings	$ 118,093	$ -	$ -	$ -	$ 118,093	40	3%	$ 2,982	$ 2,982	$ -	45
1820	Distribution Station Equipment <50 kV	$ 3,129,334	$ -	$ 535,000	$ -	$ 3,396,834	39	3%	$ 86,817	$ 86,817	$ -	40-45
1830	Poles, Towers & Fixtures	$ 3,512,797	$ -	$ 94,148	-$ 1,939	$ 3,561,810	44	2%	$ 81,536	$ 81,536	$ -	45
1835	Overhead Conductors & Devices	$ 2,631,856	$ -	$ 164,848	$ -	$ 2,714,280	57	2%	$ 47,605	$ 47,605	$ -	60
1840	Underground Conduit	$ 387,304	$ -	$ -	$ -	$ 387,304	49	2%	$ 7,856	$ 7,856	$ -	50
1845	Underground Conductors & Devices	$ 1,415,900	$ -	$ 19,983	$ -	$ 1,425,892	36	3%	$ 39,662	$ 39,662	$ -	40
1850	Line Transformers	$ 4,472,880	$ -	$ 382,709	-$ 4,301	$ 4,668,535	44	2%	$ 107,157	$ 107,157	$ -	45
1855	Services (Overhead & Underground)	$ 831,899	$ -	$ 66,482	$ -	$ 865,140	57	2%	$ 15,264	$ 15,264	$ -	60
1860	Meters	$ 122,715	$ 30,404	$ -	$ -	$ 92,311	12	9%	$ 8,000	$ 8,000	$ -	15
1860	Meters (Smart Meters)	$ 1,458,348	$ 504,857	$ 280,759	$ -	$ 1,093,870	16	6%	$ 68,116	$ 68,116	$ -	25
1910	Leasehold Improvements	$ 34,718	$ -	$ 19,000	$ -	$ 44,218	13	8%	$ 3,534	$ 3,534	$ -	10
1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ 294,840	$ 221,057	$ 16,000	$ -	$ 81,783	7	14%	$ 11,857	$ 11,857	$ -	5
1930	Transportation Equipment	$ 1,831,757	$ 423,050	$ -	$ -	$ 1,408,707	9	11%	$ 160,225	$ 160,225	$ -	8-15
1940	Tools, Shop & Garage Equipment	$ 153,960	$ 56,457	$ 15,000	$ -	$ 105,003	11	9%	$ 9,277	$ 9,277	$ -	10
1955	Communications Equipment	$ 30,622	$ 29,223	$ -	$ -	$ 1,399	10	10%	$ 141	$ 141	$ -	5
1980	System Supervisor Equipment	$ -	$ -	$ 425,000	$ -	$ 212,500	20	5%	$ 10,625	$ 10,625	$ -	
2440	Deferred Revenue5	-$ 3,021,465	$ -	-$ 480,000	$ -	-$ 3,261,465	42	2%	-$ 77,292	-$ 77,292	$ -	38
	TOTAL PP&E FOR RATE BASE	$ 18,098,019	$ 1,639,524	$ 1,608,929	-$ 6,240	$ 17,269,199	510	111%	$ 607,720	$ 607,720	$ -	
2055	WIP											
	Deferred Revenue (Fully Allocated)											
	TOTAL	$ 18,098,019	$ 1,639,524	$ 1,608,929	-$ 6,240	$ 17,269,199	$ 510	$ 1	$ 607,720	$ 607,720	$ -	

2.4. DERIVATION OF THE WORKING CAPITAL ALLOWANCE

The Working Capital Allowance (WCA) has been derived in accordance with OEB policy by applying the 7.5 percent allowance to the sum of Power Supply Expenses and eligible OM&A cost categories. No lead/lag study has been undertaken, as none was required or previously ordered.

As shown in Table 22, the Test Year WCA of $1,473,029 represents an increase of $428,989 compared to the 2022 Board-Approved amount. This change is a direct result of increases in the underlying components, primarily OM&A and Power Supply Expenses, rather than a change in methodology.

The drivers of these increases are discussed in detail in their respective sections, including the OM&A evidence in Exhibit 4 and the Power Supply forecast in Exhibit 2 at the next section. No additional factors or adjustments have been applied to the WCA calculation. The resulting allowance reflects the level of working capital reasonably required to support RSL's day-to-day operations during the Test Year.

Table 22 – Trend in Working Capital Allowance

Particulars	BOARD APPR.	2022	2023	2024	2025	2026	2027
3500-Distribution Expenses - Operation	$362,465	$251,389	$393,552	$537,863	$544,362	$592,052	$654,159
3550-Distribution Expenses - Maintenance	$450,600	$530,811	$426,412	$457,861	$683,529	$680,604	$692,022
3650-Billing and Collecting	$551,220	$535,943	$548,247	$552,675	$551,937	$596,041	$618,562
3700-Community Relations	$32,500	$32,838	$25,030	$11,231	$6,068	$23,522	$24,227
3800-Administrative and General Expenses	$1,085,627	$1,304,106	$1,389,662	$1,388,654	$1,503,935	$1,672,788	$1,729,967
Other Expenses or Adjustments	$32,200	$28,684	$29,442	$31,197	$32,403	$33,375	$34,377
Total Eligible Distribution Expenses	$2,514,612	$2,683,772	$2,812,344	$2,979,482	$3,322,235	$3,598,382	$3,753,313
Power Supply Expenses	$11,405,913	$13,221,340	$12,927,669	$14,623,591	$15,591,558	$16,059,305	$15,887,077
Total Expenses for Working Capital	$13,920,525	$15,905,112	$15,740,013	$17,603,073	$18,913,794	$19,657,687	$19,640,390
Working Capital factor	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
T O T A L	$1,044,039	$1,192,883	$1,180,501	$1,320,230	$1,418,535	$1,474,327	$1,473,029

2.3.1 Derivation of the Cost of Power

Cost of power has been determined in accordance with OEB-approved methodologies, including the application of Uniform Transmission Rates, the Smart Metering Entity charge, and applicable regulatory charges, based on the most recent OEB-approved values. The components of RLS's cost of power are summarized below and detailed in several tables illustrated over the following pages. RLS confirms that it used the most up to date inputs and guidelines to determine its cost of power.

Table 23 – 2025 Cost of Power

Component	$	Calculated based on loss-adjusted or non-loss adjusted
4705 -Power Purchased	$11,923,274	Loss adjusted
4707- Global Adjustment	$3,987,629	Loss adjusted
4708-Charges-WMS	$336,497	Loss adjusted
4714-Charges-NW	$919,141	Loss adjusted
4716-Charges-CN	$750,397	Loss adjusted
4716-RPPP	$71,274	Loss adjusted
4750-Charges-LV	$430,807	Non-loss-adjusted
4751-IESO SME	$30,834	Customer Count
Misc A/R or A/P	-$2,562,776	OEB directed
TOTAL	**$15,887,077**	

Commodity and Global Adjustment non-RPP (4705- Power Purchased and 4707 Global Adjustment)

RLS attests that the Cost of Power is determined by the split between RPP and non-RPP customers based on actual data, using the most current RPP price and current UTR. RLS calculated the cost of power for the 2027 Test Year based on the results of the load forecast discussed in detail in Exhibit 3. The commodity prices used in the calculation were published in the Board's "Regulated Price Plan - Price Report Nov 01, 2025, to October 31, 2026. Should the Board issue a revised Regulated Price Plan Report before the Board's Decision in the application, RLS will update the electricity prices in the forecast.

The Commodity share of the Cost of Power is calculated in the same manner as has been previously approved by the OEB in RLS's previous Cost of Service application and other applications.

The sale of energy is a flow-through revenue, and the cost of power is a flow-through expense. Energy sales and the cost of power expense are presented in the table below. RLS records no profit or loss from the flow-through energy revenues and costs. Any temporary variances are included in the RSVA account balances.

Commodity			**2027 Test Year**				
Customer							
Class Name	UoM	Class A Non-RPP Volume**	Class B Non-RPP Volume**	Class B RPP Volume**	Average HOEP	Average RPP Rate	Amount
Residential	kWh	$0	$308,682	$49,733,355	$0.0575	$0.1279	$6,379,146
General Service < 50 kW	kWh	$0	$3,553,881	$19,132,696	$0.0575	$0.1279	$2,651,647
General Service > 50 to 4999 kW	kWh	$14,474,661	$27,506,665	$2,656,894	$0.0575	$0.1279	$2,754,189
Unmetered Scattered Load	kWh	$0	$58,023	$580,234	$0.0575	$0.1279	$77,555
Sentinel	kWh	$0	$0	$137,577	$0.0575	$0.1279	$17,597
Streetlights	kWh	$0	$564,219	$83,588	$0.0575	$0.1279	$43,140
TOTAL		$14,474,661	$31,991,470	$72,324,343			**$11,923,274**

**Regulated Price Plan Price Report November 1, 2025, to October 31, 2026, Ontario Energy Board Oct 17,2025*

Global Adjustment	
Customer	
Class Name	UoM
Residential	$18,462
General Service < 50 kW	$212,558
General Service > 50 to 4999 kW	$1,645,174
Unmetered Scattered Load	$3,470
Sentinel	$0
Streetlights	$33,746
Class A	$2,074,219
TOTAL	**$3,987,629**

Transmission Network and Connection Charges (4714-Charges-NW and 4716-Charges-CN)

Electricity distributors are charged for transmission costs at the wholesale level and subsequently pass these charges on to their distribution customers through the Retail Transmission Service Rates (RTSRs). For each distribution rate class, there are two RTSRs:

- RTSR Network charge - recovers the Uniform Transmission Rates (UTR) wholesale network service charge
- RTSR Connection charge - recovers the UTR wholesale line and transformation connection charges.

The table below summarizes the projected transmission network and connection expenses, applying the proposed rates to the 2027 load forecast kWh and kW volumes:

Table 24 - Transmission Network and Connection Expenses

TRANS-NETWORK		TRANS-NETWORK			TRANS-NETWORK			
Class per Load Forecast	UoM	Volume	RPP Rate	Total	Volume	Non-RPP Rate	Total	Total
Residential	kWh	49,733,355	$0.0078	$388,432	308,682	$0.0078	$2,411	$390,843
General Service < 50 kW	kWh	19,132,696	$0.0071	$135,847	3,553,881	$0.0071	$25,233	$161,081
General Service > 50 to 4999 kW	kW	7,311	$2.9443	$21,525	114,533	$2.9443	$337,223	$358,747
Unmetered Scattered Load	kWh	580,234	$0.0071	$4,120	58,023	$0.0071	$412	$4,532
Sentinel	kW	152	$2.2318	$340	0	$2.2318	$0	$340
Streetlights	kW	206	$2.2204	$457	1,415	$2.2204	$3,142	$3,599
TOTAL		**69,453,953**	**$0.0000**	**$550,721**	**4,036,534**	**$0.0000**	**$368,421**	**$919,141**

TRANS–CONNECT		TRANS–CONNECT			TRANS–CONNECT			
Class per Load Forecast	UoM	Volume	RPP Rate	Total	Volume	Non-RPP Rate	Total	Total
Residential	kWh	49,733,355	$0.0064	$319,501	49,733,355	308,682	$0.0064	$1,983
General Service < 50 kW	kWh	19,132,696	$0.0059	$112,023	19,132,696	3,553,881	$0.0059	$20,808
General Service > 50 to 4999 kW	kW	7,311	$2.3726	$17,345	7,311	114,533	$2.3726	$271,741
Unmetered Scattered Load	kWh	580,234	$0.0059	$3,397	580,234	58,023	$0.0059	$340
Sentinel	kW	152	$1.8723	$285	152	0	$1.8723	$0
Streetlights	kW	206	$1.8345	$378	206	1,415	$1.8345	$2,596
TOTAL		**69,453,953**	**$0.0000**	**$452,929**	**4,036,534**	**$0.0000**	**$297,468**	**$750,397**

**Rates are based on 2026 Preliminary Uniform Transmission Rates and Hydro One Sub-Transmission Rates - OEB File Number: EB-2025-0232*

The transmission network charges, included in the Cost of Power for the Test Year 2027, are projected at $919,141, and the connection charges are projected at $750,397. The Rates are applied to the 2027 Load Forecast to determine the amount included in the Cost of Power.

Wholesale Market Service Charges & Capacity Based Recovery Charges (4708-Charges-WMS)

The OEB released Decision and Order for the Wholesale Market Service (WMS) effective December 10, 2024. The Board's decision is summarized as follows:

- For Class B customers, a Capacity-based Recovery (CBR) component of $0.0004 per kilowatt-hour shall be added to the WMS rate for a total of $0.0041 per kilowatt-hour.
- For Class A customers, distributors shall bill the actual CBR costs to Class A customers in proportion to their contribution to the peak.

In compliance with this order, RLS has applied the Board-approved rate of $0.0045/kWh to its' 2027 Load Forecast to include a total of $336,497 for WMS in its' Cost of Power projections as illustrated in the table below:

Table 25- Wholesale Market and CBR

WHOLESALE MP		WHOLESALE MP				WHOLESALE MP		
Class per Load Forecast	UoM	Volume	RPP Rate	Total	Volume	Non-RPP Rate	Total	Total
Residential	kWh	49,733,355	$0.0041	$203,906.75	308,682	$0.0041	$1,265.59	$205,172.35
General Service < 50 kW	kWh	19,132,696	$0.0041	$78,444.05	3,553,881	$0.0041	$14,570.91	$93,014.97
General Service > 50 to 4999 kW	kW	7,311	$0.0041	$29.97	114,533	$0.0041	$469.59	$499.56
Unmetered Scattered Load	kWh	580,234	$0.0041	$2,378.96	58,023	$0.0041	$237.90	$2,616.85
Sentinel	kW	152	$0.0041	$0.62	0	$0.0041	$0.00	$0.62
Streetlights	kW	206	$0.0041	$0.84	1,415	$0.0041	$5.80	$6.65
TOTAL		**69,453,953**	**$0.0000**	**$284,761.21**	**4,036,534**		**$16,549.79**	**$301,311.00**

CLASS B CBR		CLASS B CBR				CLASS B CBR		
Class per Load Forecast	UoM	Volume	RPP Rate	Total	Volume	Non-RPP Rate	Total	Total
Residential	kWh	49,733,355	$0.0004	$19,893.34	308,682	$0.0004	$123.47	$20,016.81
General Service < 50 kW	kWh	19,132,696	$0.0004	$7,653.08	3,553,881	$0.0004	$1,421.55	$9,074.63
General Service > 50 to 4999 kW	kW	7,311	$0.0004	$2.92	114,533	$0.0004	$45.81	$48.74
Unmetered Scattered Load	kWh	580,234	$0.0004	$232.09	58,023	$0.0004	$23.21	$255.30
Sentinel	kW	152	$0.0004	$0.06	0	$0.0004	$0.00	$0.06
Streetlights	kW	206	$0.0004	$0.08	1,415	$0.0004	$0.57	$0.65
TOTAL		**69,453,953**	**$0.0000**	**$27,781.58**	**4,036,534**		**$1,614.61**	**$29,396.19**

C L A S S A C B R		**C L A S S A C B R**				**C L A S S A C B R**		
Class per Load Forecast	UoM	Volume	RPP Rate	Total	Volume	Non-RPP Rate	Total	Total
Residential	kWh							
General Service < 50 kW	kWh							
General Service > 50 to 4999 kW	kW				14,474,661	$0.0004	$5,789.86	$5,792.79
Unmetered Scattered Load	kWh							
Sentinel	kW							
Streetlights	kW							
T O T A L					**14,474,661**		**$5,789.86**	**$5,789.86**

Rural or Remote Electricity Protection Rate (RRRP) Charges

The RRRP rate used by rate-regulated distributors to bill their customers shall be $0.0006 per kilowatt-hour, effective January 1, 2026.

In compliance with this order, RLS has applied the Board Approved $0.0006/kWh to its' 2027 Load Forecast to include $71,274.28 in its' Cost of Power as illustrated in the table below:

Table 26 – Rural or Remote Electricity Rate Protection (4708-Charges-RRRP)

RRRP	**Units**	**Volume**	**Rate**	**$**	**Volume**	**Rate**	**$**	**Total**
Class per Load Forecast								
Residential	kWh	49,733,355	$0.0006	$29,840.01	308,682	$0.0006	$185.21	$30,025.22
General Service < 50 kW	kWh	19,132,696	$0.0006	$11,479.62	3,553,881	$0.0006	$2,132.33	$13,611.95
General Service > 50 to 4999 kW	kWh	2,656,894	$0.0006	$1,594.14	41,981,327	$0.0006	$25,188.80	$26,782.93
Unmetered Scattered Load	kWh	580,234	$0.0006	$348.14	58,023	$0.0006	$34.81	$382.95
Sentinel	kWh	137,577	$0.0006	$82.55	0	$0.0006	$0.00	$82.55
Streetlights	kWh	83,588	$0.0006	$50.15	564,219	$0.0006	$338.53	$388.68
SUB-TOTAL		**72,324,343**	**$0.0000**	**$43,394.61**	**46,466,132**	**$0.0000**	**$27,879.68**	**$71,274.28**

Smart Meter Charge

The proposed rate remains at $0.42 per the OEB guidance provided on December 10, 2024. In compliance with this order, RLS has applied the Board Approved rate of $0.42 per month for the forecasted Residential and General Service<50kW customers for Test Year 2027 and included the projected amount of $30,834 in its' Cost of Power as illustrated below:

Table 27 - Smart Meter Entity (4751-IESO SME)

Smart Meter Entity Charge	Customers	Rate	$
Class per Load Forecast			
Residential	5376	$0.42	$27,096.31
General Service < 50 kW	742	$0.42	$3,737.81
SUB-TOTAL			**$30,834.13**

The table below shows the derivation of proposed retail rates for Low Voltage ("LV") service. The 2027 estimates of total LV charges were calculated based on the last three years of actual charges from Hydro One. Details are shown in the next table (Table 29)

The 2027 projected LV charges are based 2025 LV charges adapted to most recently published 2026 rates.

The projections were allocated to customer classes, according to each class share of projected Transmission-Connection revenue, per Board policy. The resulting LV charges for each class were divided by the applicable 2027volumes from the load forecast, as presented in Exhibit 3. Current LV revenues are recovered through a separate rate adder and are not embedded within the approved Distribution Volumetric rate. LV rates appear on a distinct line item on the proposed schedule of rates.

Table 28 – Proposed LV Charges (4750-Charges-LV)

RRRP	Units	Volume	Rate	$	Volume	Rate	$	Total
Class per Load Forecast								
Residential	kWh	Volume	RPP Rate	Total	308,682	$0.0038	$1,157	$187,705
General Service < 50 kW	kWh	49,733,355	$0.0038	$186,547	3,553,881	$0.0034	$12,149	$77,556
General Service > 50 to 4999 kW	kWh	19,132,696	$0.0034	$65,406	114,533	$1.3258	$151,849	$161,542
Unmetered Scattered Load	kWh	7,311	$1.3258	$9,692	58,023	$0.0034	$198	$2,181
Sentinel	kWh	580,234	$0.0034	$1,983	0	$1.0463	$0	$159
Streetlights	kWh	152	$1.0463	$159	1,415	$1.0251	$1,450	$1,661
SUB-TOTAL		**69,453,953**	**$0.0000**	**$264,000**	**4,036,534**	**$0.0000**	**$166,805**	**$430,806**

2.5. DISTRIBUTION SYSTEM PLAN FOR SMALL UTILITIES

In accordance with section 2.2.2.1 of the Filing Requirements, RSL has filed its 2027–2031 Distribution System Plan as a stand-alone document in Appendix 2B. The asset condition assessment is provided in Appendix 2C.

2.2.5 Capitalization Policy- Updated for 2027 Cost of Service

The capitalization policy has not changed since the 2022 cost of service however RSL makes a point of reviewing the policy periodically to ensure that it continues to comply with applicable rules and regulations.
The table below shows a summary of the capitalization policies. The full document is presented at Appendix 2B of this Exhibit.

Table 29 – Summary Table of Capitalization Practices (Quick Reference)

Topic	Current Practice (2027)	Notes
Capital threshold	$500 per item (with exceptions for essential small components)	Threshold may be overridden using professional judgment
Useful life reviews	Annual	Reflect IFRS, Kinectrics guidance, engineering judgment
Residual value	Reviewed annually	Adjusted as required under IAS 8
Depreciation	Straight-line	Aligned to USoA categories and Kinectrics typical lifespans
Direct labour	Capitalized	Based on actual hours
Labour burden	Capitalized	Includes employer EI, CPP, OMERS, benefits, vacation, WSIB, etc.
Vehicle burden	Capitalized	Based on hourly usage rates by fleet class
Materials & supplies	Capitalized	Includes freight; excludes stockroom overhead
Indirect overhead	Not capitalized	Consistent with 2012 OEB directive
Third-party costs	Capitalized when directly attributable	Engineering, permitting, construction services
Land costs	Capitalized; not depreciated	Includes acquisition, legal, preparation
Building costs	Capitalized	Includes improvements, design costs, permits
General plant	Capitalized	Includes hardware, software, installation

Overhead and Burden Rates

RSL does not apply a formalized, composite overhead burden rate to capitalized labour. Instead, capitalization is based on directly attributable costs, including:

actual labour hours, and
specific, traceable burden components (e.g., benefits and fleet usage).

Appendix 2-D has been completed to provide transparency of capitalized OM&A, consistent with filing requirements. The amounts presented reflect select cost categories that are directly attributable to capital work, rather than the application of a standardized overhead loading factor.

As shown in Appendix 2-D:

Capitalized costs are primarily limited to employee benefits and fleet-related costs that can be reasonably and directly assigned to capital activities.
Indirect overhead costs are not capitalized, consistent with OEB policy and longstanding practice.

There have been no changes in capitalization methodology since RSL's 2022 Cost of Service application. The observed year-over-year variability in capitalized OM&A reflects:

fluctuations in capital program execution, and
the timing and nature of projects requiring internal labour and fleet resources.

APPENDICES

List of Appendices

Appendix 2A	Capitalization Policy
Appendix 2B	Distribution System Plan

Appendix A – Capitalization Policy

1. Purpose and Scope

This policy outlines how Rideau St. Lawrence Distribution Inc. (RSL) identifies, measures, and records capital assets in accordance with Generally Accepted Accounting Principles (GAAP), International Financial Reporting Standards (IFRS), and the Ontario Energy Board's (OEB) Accounting Procedures Handbook. It ensures consistent treatment of investments in property, plant, and equipment (PP&E) and the proper distinction between capital and operating expenditures.

2. Definition of Capital Assets

A capital asset is an item that provides future economic benefits and is:

1. Used in the production or supply of electricity services, administrative functions, or for the construction and maintenance of other capital assets.
2. Intended for ongoing use, not resale.
3. Expected to have a useful life of more than one year.

Expenditures that directly acquire, construct, or better an asset are capitalized. All other expenditures that maintain existing service capability without increasing service potential are expensed in the year incurred.

Professional judgment is applied to determine whether an expenditure extends service life, increases capacity, lowers operating costs, or otherwise enhances service potential.

3. Capitalization Threshold

Items with a cost of $500 or more are capitalized.

Exceptions apply for small components integral to a larger capital asset (e.g., pole ties), which are capitalized regardless of value.

RSL may override the threshold where justified by circumstances or engineering judgment.

4. Valuation of Capital Assets

The recorded value of a capital asset includes:

- Purchase price (net of discounts)
- Non-refundable taxes and import duties
- Directly attributable installation and preparation costs
- Freight and delivery
- Initial estimates of dismantling, removal, and site restoration costs, where applicable under IFRS

No administrative, stockroom, or general overhead charges are added unless directly attributable to the construction of the asset.

5. Residual Value and Useful Life

RSL reviews the residual value and useful life of each asset annually, ensuring the carrying amount remains reasonable relative to fair value.
Key factors considered include:

- Expected usage and operating conditions
- Physical wear, tear, and maintenance practices
- Technological or commercial obsolescence
- Legal or contractual limits on use
- Service life guidance from OEB-commissioned studies (e.g., Kinectrics report)
- Professional engineering and accounting judgment

Changes in estimated life or salvage value are treated as changes in accounting estimates under IAS 8.

6. Asset Categories and Depreciation

RSL categorizes its assets in accordance with the Uniform System of Accounts (USoA). Typical useful lives are summarized in Table 2.22 of RSL's prior filing (Exhibit 2, 2021 COS).
Categories include:

- Distribution stations, switchgear, line transformers
- Poles, overhead and underground conductors
- Meters
- Buildings and improvements
- General plant (IT hardware/software, fleet, tools, communication equipment)

Depreciation is calculated using the straight-line method unless IFRS requires an alternate approach.

7. Cost Components Included in Capital Projects

7.1 Materials and Supplies

All eligible materials used on capital projects, including freight, are capitalized. No stockroom overhead or administrative fees are added.

7.2 Direct Labour

Labour directly related to constructing or installing an asset is capitalized at actual cost.

7.3 Labour Burden

RSL applies an annually calculated labour burden rate that includes:

- Employer EI, CPP
- Employer Health Tax
- OMERS contributions
- Medical, dental, and life insurance
- WSIB
- Vacation, statutory holidays, bereavement, and sick leave

The burden rate is applied proportionally to direct labour charged to capital.

7.4 Vehicle and Equipment Burden

Vehicle costs are capitalized based on actual usage of vehicles on capital jobs.
Rates are established annually using:

- Depreciation
- Maintenance
- Fuel
- Insurance
- Expected annual hours of use

Burden is allocated according to documented job-site hours.

7.5 Third-Party Costs

Eligible external engineering, construction, permitting, and related services directly attributable to a capital asset are capitalized.

8. Treatment of Specific USoA Accounts

8.1 Land (Account 1805)

Capitalized costs include:

- Purchase price
- Closing and legal costs
- Survey and land transfer taxes
- Grading, clearing, demolition of existing structures (net of salvage proceeds)

Land is normally not depreciated.

8.2 Buildings (Account 1808)

Capitalized building costs may include:

- Purchase or construction cost
- Renovation or remodel costs required to make the building suitable for use
- Architectural, engineering, and permitting costs
- Capitalized interest during construction

Assets may be subdivided into components (structure, roof, interior construction, external fences, etc.) for depreciation purposes.

8.3 General Plant (Accounts 1611, 1920–1955)

Capitalized costs include:

- Purchase price
- Freight and installation
- Related IT services for commissioning hardware/software

9. Capitalization of Overhead

Consistent with the OEB’s July 17, 2012 directive, indirect overheads (general administration, corporate services) are not capitalized.

Only directly attributable costs—labour burden and vehicle burden—are included in capital project costs. RSL recalculates its burden rates each year based on actual costs.

10. Changes to Policy

RSL implemented required IFRS-related capitalization changes effective January 1, 2012. No further substantive changes have been made since the 2022 Cost of Service Application. This 2027 version updates structural clarity but does not alter underlying accounting rules.

Appendix B – Distribution System Plan

RIDEAU ST. LAWRENCE DISTRIBUTION INC.

DISTRIBUTION SYSTEM PLAN

2027–2031

TABLE OF CONTENT

TABLES AND FIGURES

1. DISTRIBUTION SYSTEM PLAN

This Distribution System Plan (DSP) has been prepared by Rideau St. Lawrence Distribution Inc. (RSL) in accordance with the requirements of the Ontario Energy Board. The DSP documents RSL's current planning practices, policies, and processes; demonstrates how investment decisions are made prudently and cost-effectively; and provides stakeholders with a transparent view of RSL's asset management framework and capital expenditure priorities. The DSP is a living document and is reviewed and updated on a regular basis to reflect changes in system conditions, customer needs, and regulatory requirements.

1.1.1. Alignment with OEB Filing Requirements

This DSP follows the section structure and sequencing outlined in Chapter 5 of the OEB Filing Requirements for Electricity Transmission and Distribution Applications. Where numbering differs, the applicable Chapter 5 reference numbers are identified in the relevant section headings.
Consistent with OEB guidance, RSL categorizes its capital investments into the following four investment groupings:

- System Access,
- System Renewal,
- System Service, and
- General Plant.

Alignment with the OEB's investment categories supports consistency, transparency, and comparability across regulatory filings and enables clear communication with the OEB, customers, and municipal stakeholders.

1.1.2. DSP Time Horizon

This DSP covers the following periods:

- Historical: 2021-2025 (Reflecting Board Approved Data, Actual Expenditures)
  - *Some historical reference has been listed to check against the OEB reliability performance targets
- Bridge Year: 2026
- Test Year: 2027
- Forecast: 2028 through 2031

All cost information and planning practices reflected in this DSP are current as of the end of 2026. Capital expenditures are presented consistently using OEB investment categories throughout the Plan.

Project-level details are provided for all capital investments exceeding RSL's materiality threshold of $50,000, as described in Exhibit 1.

1.1.3. Context and Corporate Objectives

RSL is a small distributor serving six communities in Eastern Ontario. Its system is fully embedded in Hydro One Networks Inc. (HONI), with each community operating as an electrically independent system. This structure simplifies local operations but reduces contingency options during upstream outages, highlighting the importance of careful local investment and strong preventative maintenance.

RSL is guided by the four objectives of the Renewed Regulatory Framework for Electricity (RRFE):

- Customer Focus – ensuring reliability and affordability while engaging directly with customers.
- Operational Effectiveness – maintaining efficient, coordinated, and prudent use of resources.
- Public Policy Responsiveness – meeting provincial and regional requirements for renewable generation, conservation, and smart grid readiness.
- Financial Performance – ensuring sustainable financial health while moderating customer bill impacts.

Historically RSL has had strong performance in the first 3 objectives but has had a difficult time in obtaining getting a fair financial return as demonstrated by its historical Return on Equity. RSL aims to achieve a fine balance of prudent spending justifiable capital plan that can be executed with the reasonable returns.

1.1.4. Planning Inputs

In developing this DSP, RSL considered a broad range of inputs, including:

- RSL is a small distributor serving six communities in Eastern Ontario. Its system is fully embedded in Hydro One Networks Inc. (HONI), with each community operating as an electrically independent system. This structure simplifies local operations but reduces contingency options during upstream outages, highlighting the importance of careful local investment and strong preventative maintenance.
- RSL is guided by the four objectives of the Renewed Regulatory Framework for Electricity (RRFE):
- Historically RSL has had strong performance in the first 3 objectives but has had a difficult time in getting a fair financial return as demonstrated by its historical Return

on Equity. RSL aims to achieve a fine balance of prudent spending justifiable capital plan that can be executed with reasonable returns.

RSL continues to rank critical asset projects using these inputs to balance reliability and cost. The capital expense program outlined later in this document includes projects driven by considerations such as safety, system reliability, customer demand, and system loss reduction.

RSL has developed a capital expense model based on consistent criteria with weighted factors.
Local drivers were also considered, based on meetings with customers, Municipal Councils, Municipal staff, and local developers.

Prior to 2021, there have been no large-scale subdivision developments; however, in the most recent 5 years, developers have started to build in the RSL service areas. Currently, RSL has 2 active multiphase subdivisions under development in our service areas – Watercolours in Westport and Merkley Oaks in Iroquois. There are also numerous smaller single phased developments as well. Planning lead times from developers in these projects have been short and historically hard to forecast, but RSL has been very responsive to the needs of the community and developers for new housing.

The official plans for the communities served by RSL are accessible through municipal websites and were utilized in formulating the plan for context.

1.1.5. Customer Engagement

Over the past five years, RSL has demonstrated strong customer satisfaction compared to provincial peers. However, maintaining reliability requires consistent engagement. To serve customer interests better, RSL makes substantial efforts to engage directly with customers, regional partners, and third parties.

Engagement activities include:

- direct meetings with customers at sites, customer premises, and in RSL's Prescott office,
- remote meetings with customers and developers through phone and MS Teams,
- customer satisfaction surveys,
- monthly meetings and dialogue from RSL leadership with municipal leadership of all 6 territories that RSL serves.
- Board meeting summaries from the board of directors to a municipal leadership of all 6 territories that RSL serves.

- regional planning with HONI and the IESO.
- Annual CEO outreach to the 10 largest customers in the service area.

Customer engagement activity consistently identifies 3 major vectors that are important to the customers.

1. Economic Development – servicing the growth of the region is important for all rate payers. The customers want RSL to prudently support the development of the area.
2. Reliability – RSL service territory increasing is having more customers rely on power for their lives.
3. Affordability – prudent utilization of capital to maintain the community

These results heavily influence RSL's capital prioritization.

1.1.6. Capital Expenditure Trends

RSL's recent 5-year historical capital expenditures averaged about $1.57M annually. This amount already significantly exceeds the capital plan from the most recent cost of service. This amount does not factor in 2026 which includes a significant capital expenditure of $4.7M. The amount of annual capital is expected to rise to roughly $2.0M per year during the forecast period 2027-2031.

The increase reflects:

- Increase in system access for capacity needs for the area
- Increase in system service to improve system reliability and system hardening
- Increase in cost of all capital due to inflation
- ongoing end-of-life pole, transformer, and conductor replacement projects, while improving the design based on customer input
- ongoing necessary general plant investments metering, replacing vehicle fleets, and adding a backyard Derrick to support the conversion of rear lot designs in the most efficient manner.

These investments are required to provide access to the new customers, continue improvement in service reliability, and ensure safety over the long run. Importantly, RSL's service territory is starting to experience load growth, so the capital plan reflects the requirements of a territory with growing loads

1.1.7. Key Elements of the DSP

The key elements of this DSP include base components that stayed consistent with RSL's previous plan:

- Typically, spending needs of a small distributor serving a customer base.
- Targeted sustainment investments to replace aging and deteriorating assets.
- Focused renewal to maintain system reliability and safety.
- Steady General plant investments Fleet, Metering.

RSL's investment planning follows good utility practice, emphasizing:

- customer service,
- asset condition data and end-of-life assessments,
- coordination with municipal capital projects,
- compliance with regulatory obligations, and
- prudent pacing of investments

Additionally, RSL in this DSP has had a few strategic shifts.

To accentuate reliability, RSL had added the following major initiatives to the DSP:

- Implementing SCADA and SCADA capable reclosures, switches to improve reliability and resiliency
- When prudent system renewals are warranted, RSL is strategically converting rear lot designs to roadside designs to improve reliability and serviceability while minimizing customer disruption.

1.2. Utility Overview and System Configuration

1.2.1. Utility Overview

RSL serves six communities: the Town of Prescott and the Village of Westport, Cardinal within The Township of Edwardsbugh Cardinal, Iroquois, Morrisburg, and Williamsburg within the Municipality of South Dundas in Eastern Ontario (Figure 1). These communities are well-established areas with a customer density of 52 customers per kilometre of primary line. The distribution network includes nine distribution stations owned by RSL and two stations shared with Hydro One Networks Inc. (HONI). The RSL distribution system is fully integrated into HONI's system, comprising 18 km of underground lines, 101 km of overhead lines supported by 2069 poles, and 939 utility-owned transformers.

The distance between the easternmost and westernmost communities is 130 km. The utility covers a total area of 18 km². RSL primarily operates from its central location in Prescott.
Since the last application, the service area has remained unchanged. The distribution systems serviced by RSL are separate and operate independently. All areas are functioning well. Assets are being assessed proactively. RSL has continued with Preventative Maintenance program to continue enhancing the reliability while minimizing cost impacts to the customers.

Table 1 - Service Area

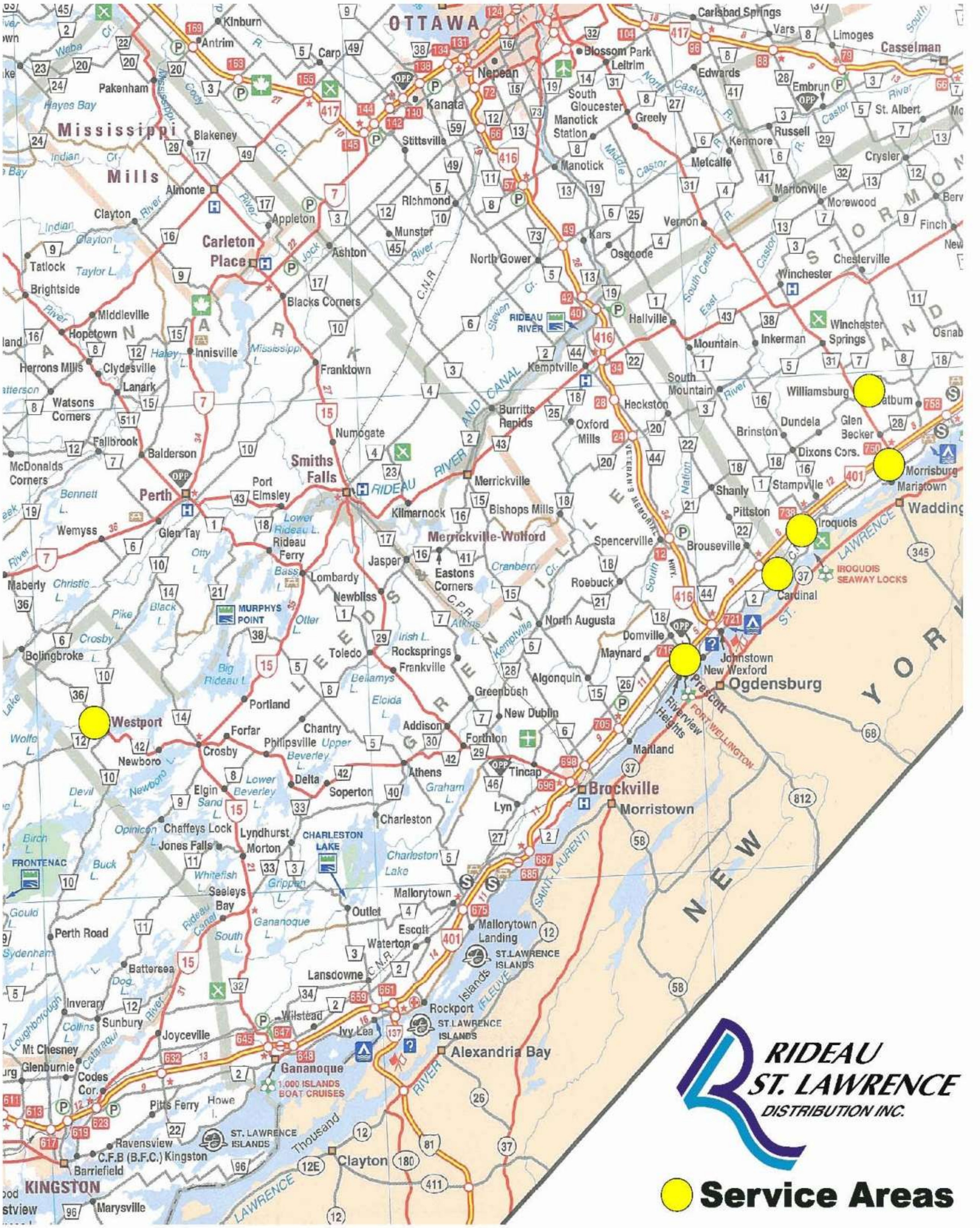


Table 2 - Customer, Load, and Energy Data (2021–2026)

Customer Class	2022	2023	2024	2025	2026
Residential	5,113	5,107	5,136	5,214	5,348
General Service < 50 kW	735	731	730	731	741
General Service > 50 to 4999 kW	62	61	61	59	66
Unmetered Scattered Load	57	57	57	57	60
Sentinel	74	73	70	70	70
Streetlights	1,711	1,712	1,712	1,712	1,713
Total	**7,752**	**7,741**	**7,766**	**7,843**	**7,998**
Total kWh Purchased	**108,472,320**	**107,336,310**	**108,800,087**	**112,227,283**	**117,184,463**
Winter Peak (kW)	19591.61	19313.98	18520.53	19852.36	20250.00
Summer Peak (kW)	19046.76	19152.56	19347.49	20503.79	20700.00
Average Peak (kW)	16875.80	17066.38	17347.64	18246.35	18750.00

1.2.2. Overview of System Configuration

Rideau St. Lawrence Distribution Inc. (RSL) operates a fully embedded system within Hydro One Networks Inc. (HONI). RSL serves territories in Eastern Ontario: Prescott, Westport, Cardinal, Iroquois, Morrisburg, and Williamsburg. The communities are geographically separated, and each operates as an electrically independent distribution system, with no direct interconnection between them

Power supply is primarily received at 44 kV from HONI at multiple points of supply. The 44kV supply feeds into 9 RSL owned distribution stations that will grow to 10 by the end of 2026. Depending on the area, the stations steps down the 44 kV supply to distribute the power at industry standard voltages of 4.16kV L-L (2.4kV L-N) or 8.31kV L-L (4.8 kV L-N).

Separately, RSL also receives power supply from HONI distribution feeders. These feeders are utilized to for two purposes:

- Providing 44kV power to feed large customers directly.
- In Westport and Williamsburg Hydro One feeders at 8.31kV L-L (4.8kV L-N) are utilized to distribute power.

Since the systems are isolated, planning, maintenance, and outage response must be handled on a community-by-community basis.

As of 2026, RSL's system assets include approximately 119 km of primary lines (101 km overhead and 18 km underground), supported by 2069 poles, and 939 utility-owned transformers (809 overhead, 130 underground).

The system also includes eight 15 kV load-break switches, ten 44 kV air-break switches, and 75 in-line switches to support sectionalizing and system reliability.

RSL has implemented a Preventive Maintenance program to address asset condition and improve reliability, focusing on inspection of poles, switches, and transformers. Asset health is tracked through visual inspections and condition assessment ratings.

Table 3 - Key Characteristics of RSL's System

Key Characteristics of RSL's System (2021 DSP)	
Communities served	6 (Prescott, Westport, Cardinal, Iroquois, Morrisburg, Williamsburg)
Stations	10
Poles	2069
Primary Lines	119 km (101 km OH, 18 km UG)
Transformers	939 (809 OH, 130 UG locations)
Switches	8 gang operated (15 kV), 10 air-break (44 kV), 75 in-line switches
Smart Meters Deployed	6170
Service area	~18 km², with 52 customers per km of primary line

1.2.3. System Load Capacity

RSL manages load capacity annually through its natural planning and connection with customers. This traditional way has worked well in a low growth environment. With the recent growth developers and customers, in 2025 RSL conducted a study of a load study with a 3rd party engineer to get better and detailed understanding of how best to plan capacity now that. The study has reconfirmed the areas and the plan that RSL had to invest in the system access for capacity.

Table 4 - RSL Station and Feeder Load Study in 2025

Station Name	Station Load	Feeder 1 Load	Feeder 2 Load	Feeder 3 Load	Feeder 4 Load
Cardinal MS1	45%	75%	Spare	NA	NA
Cardinal MS2	40%	26%	41%	NA	NA
Iroquois MS1	95%	25%	41%	NA	NA
Iroquois MS2 (new)	TBD	TBD	TBD	NA	NA
Morrisburg MS1	31%	32%	18%	10%	NA
Morrisburg MS2	63%	42%	45%	70%	NA
Prescott MS1/QL2	57%	26%	31%	37%	NA
Prescott MS2/QL20	22%	Spare	50%	NA	NA
Prescott MS3/QL40	59%	36%	35%	56%	Spare
Prescott MS4/QL30	31%	28%	43%	NA	NA
Westport	NA	63%	NA	NA	NA
Williamsburg	NA	32%	NA	NA	NA

Iroquois is growing with significant subdivision development. It currently only has 1 station feeding the territory that is loaded to 95% of capacity. After the completion of installing Iroquois MS2 in 2026, the increased capacity would service the new subdivision currently in development and it will allow for improved system hardening with backup station and feeders, while also improving SAIDI and SAIFI to have a second station to feed the town while the substations are being maintained.

Cardinal currently has 2 stations with 2 feeders each. One of the feeders is loaded to 75% of capacity. RSL system was designed decades ago in a radial manner and doesn't allow for back feed and load shedding. Investing in the system service interties in Cardinal and smaller projects in Prescott will facilitate distribution of the load and improve resiliency in the system as well.

The rest of the feeders and station transformers are adequately loaded for the near term.

System Generation Capacity

In 2022 RSL coordinated with Hydro One Networks Inc. (HONI) to study the generations constraints at the HONI TS. Previously RSL had not been able to connect any customers in all 6 service territories. However, after the work with HONI, RSL obtained alignment and lifted restrictions in Westport and Prescott (RSL's service areas that aren't fed from the Morrisburg TS). This has allowed RSL to connect 14 micro generation DER's in its service area.

Additionally, in the thermally constrained area of Iroquois, RSL was able to connect a large industrial generation project to offset new load, by working with the RSL customer and HONI to work through all the requirements to ensure that it doesn't cause power quality issues.

Table 5 - RSL Station and Feeder Generation Constraints

Station Name	Station Load	Feeder 1 Load	Feeder 2 Load	Feeder 3 Load	Feeder 4 Load
Cardinal MS1					
Cardinal MS2					
Iroquois MS1					
Iroquois MS2 (new)					
Morrisburg MS1					
Morrisburg MS2					
Prescott MS1/QL2					
Prescott MS2/QL20					
Prescott MS3/QL40					
Prescott MS4/QL30					
Westport					
Williamsburg					

Legend:

Red: Constraint due to RSL
Orange Constraint due to upstream Hydro One
Green No Constraint
Grey No RSL Asset to comment

Note: Prescott feeders are shown as no constraint in this section. This area is normally supplied via the Hydro One Brockville TS (Normally closed "NC" Configuration). An alternate supply path exists via Morrisburg TS (Normally open "NO" configuration) for contingency purposes. The alternate feeder has a thermal constraint for DER hosting capacity. DER capacity shown reflects normal system configurations.

There continues to be more customers interested in connecting to generation capacity. RSL has taken initiative to work with HONI to enable more generation capacities, by conducting Connection Impact Assessments and including scope into the 2026 regional planning process to add the generation capacity into scope for the RSL customers.

Since there are no constraints within the RSL system, there are no investments within the RSL system for the purpose of DER and generation capacity in this DSP.

1.3. Asset Management Drivers, Strategy and Objectives

1.3.1. Overview

RSL's Asset Management Plan has been developed in accordance with the OEB's Distribution System Code (DSC) and recognized good utility practices. The plan sets out RSL's asset management philosophy and the key elements of the process that influence capital investment decisions, ensuring consistency with the OEB's Renewed Regulatory Framework for Electricity (RRFE). While capital expenditures are presented by OEB investment category, RSL evaluates alternatives using a total cost of ownership lens that considers inspection effort, outage response costs, contractor reliance, and safety exposure over the expected service life of the asset.
The asset management process incorporates available asset inventory and lead times, asset condition information derived from visual inspections and stress calculations, existing capital expenditure programs, and accepted industry practices.

To improve the effectiveness of its program, RSL implemented a Preventive Maintenance Program. This program provides a framework for RSL to plan, track, the assets under RSLs control. Annual investments in the past were primarily directed toward system renewal projects, including the replacement of deteriorated poles, aged transformers, along with the mitigation of PCB transformers. However, in the recent 5 years and capital outlook the development, customers drivers have changed. Significant investments are being made for system access and system service.

1.3.2. Business and Sector Drivers

The drivers influencing RSL's asset management activities are rooted in both internal system needs and external sector requirements. Customer demand, particularly from residential and commercial development, continues to shape the timing and scale of investments.

System reliability, resiliency, efficiency (cost), and economic development are ongoing considerations, as are municipally driven relocations and capacity requirements. Regulatory and legislative compliance obligations also inform the scope of capital programs, while the renewal of aging infrastructure remains a constant priority. In addition, technological changes, such as the integration of smart meters implemented in 2009 are reaching the end of life and are becoming an important component to renew. RSL reviews local municipal official plans and has regular communication with customers, municipal staff and elected officials to ensure that its capital investments are aligned with community growth and broader infrastructure

1.3.3. Strategy

RSL's DSP is designed to present a fully integrated approach to capital expenditure planning. This RSL's strategy for asset management is to maintain a fully integrated approach to capital expenditure planning, linking historical performance from 2021 to 2026 with forecast needs for the 2027 to 2031 period. This approach ensures that capital planning reflects not only the company's operational history but also projected system requirements. Strategic priorities include collaboration with other CHEC utilities, USF organization, and the EDA to achieve cost efficiencies, maintaining awareness of regulatory and sector changes, and balancing the objectives of reliability, efficiency, and economic development.

Project selection and prioritization are guided by the OEB-prescribed project rating system, which ensures transparency and defensibility. Each project is evaluated against six weighted factors: safety, environmental benefits, efficiency and customer value, reliability, coordination and interoperability, economic development, and cybersecurity and privacy. This structured evaluation framework allows RSL to compare projects on a consistent basis and to focus resources on those that most strongly support corporate and regulatory objectives.

1.3.4. Objective

RSL's asset management objectives provide the guiding framework for its capital program and support its broader mission to deliver safe, reliable, and cost-effective service to its customers. The company is committed to constructing, maintaining, and operating its assets in a manner that ensures safety for staff, contractors, and the public. It actively seeks to balance investment decisions with the need to maintain reliability, and aligns capital investments with customer expectations regarding cost, reliability, and service performance.

RSL places a strong emphasis on sustainable cost efficiencies in deployment, operations, and maintenance, and manages the pace and magnitude of investments to minimize customer rate impacts while preserving financial stability. Environmental considerations are integrated into planning and design, and growth and loading requirements are addressed through careful capacity planning. Where appropriate, RSL also incorporates new technologies that enhance the efficiency, operability, or reliability of the system.

When system is being renewed, RSL looks for opportunities to prudently improve the system. This can be looking for opportunities to improve system design from rear lot construction to roadside design. This includes incorporating interties to system renewal projects.

RSL also seeks proven technologies to achieve its objectives such as incorporating SCADA and the appropriate SCADA capable reclosers and switches for the systems.

These objectives are embedded within RSL's Capital Investment Process (CIP). CIP is reviewed annually by management and the Board of Directors, with quarterly reviews providing flexibility to reallocate funds in response to emerging non-discretionary needs. In this way, RSL ensures that its capital investment program remains both responsive and aligned with corporate objectives and stakeholder expectations.

1.4. Asset Management Planning Process

1.4.1. Planning Methodology

RSL's approach to asset planning aligns with the five key processes required by the OEB. The process begins with a review of overall system performance and whether that performance meets management objectives.

The core components of the process include:

- Asset inspection and condition assessment (field inspections, stress measurements, life expectancy, fault frequency, maintenance costs, and service impacts)
- Preventive maintenance and operational programs
- Capital expenditure planning
- Supporting information management systems
- Risk and performance monitoring

Asset plans are developed by first identifying non-discretionary projects. These include system access projects, such as system expansion projects required to connect new customers, as well as connecting fibre and bringing affected joint-use poles up to regulatory standards. Non-discretionary work also includes the replacement of assets that have reached end of life with high risk of imminent failure with significant negative impact, such as metering units and other critical equipment.

Next, discretionary projects are identified. RSL evaluates prudent discretionary spending opportunities that maintain system performance while delivering added value to customers. These initiatives include time-based maintenance to prevent failures while improving safety. Some of these examples include replacement of aged kiosks, and renewal work identified through inspection programs as end of life. When renewing the system, RSL also seeks opportunities to improve system design, such as removing small conductors during renewal work and relocating backyard construction to the roadside where feasible.

RSL then, within discretionary spending, prioritizes projects that most cost-effectively improve system reliability and resiliency. This includes investments in SCADA,

SCADA-capable switches, and SCADA-compatible reclosers. Where opportunities arise, RSL leverages external funding programs, such as NRCan grants, to accelerate these investments. Reliability and resiliency improvements also include adding interties as part of system renewal projects, which helps defer the need for new substations and additional capacity by better utilizing existing system infrastructure.

Finally, RSL evaluates the most cost-effective means of executing its capital and maintenance programs. This includes assessing the need for acquiring new fleet and renewing fleet and specialized equipment required to deliver work efficiently. For the customer, it is more economical for RSL to use its own staff and equipment to complete core work, while selectively using contractors to supplement internal resources, rather than contracting all work externally. RSL evaluates the total lifecycle cost of acquiring and maintaining equipment versus contracting work, with end-of-life service vehicles serving as a typical example where replacement has become more economical than continued refurbishment or maintenance.

1.4.2. Data Inputs and Planning Criteria

In developing this Distribution System Plan, RSL relied on a range of qualitative and quantitative inputs to identify system needs, prioritize investments, and ensure that capital expenditures are prudent, cost-effective, and aligned with customer and regulatory expectations. Planning inputs considered in this DSP include:

- Asset inventory data and condition information
- Inspection results, maintenance records, and regulatory compliance requirements
- Reliability performance metrics and outage history
- Customer engagement results and qualitative customer feedback
- Municipal and regional planning information, including development activity
- Provincial transportation planning information
- Vegetation management assessments
- Capacity and system studies
- Load and demand forecasts, including the effects of conservation
- Regulatory obligations, technical standards, and codes
- Corporate strategic objectives

These inputs are used collectively to inform RSL's asset management and capital planning decisions. Capital projects are assessed and prioritized based on a combination of asset condition, performance history, safety considerations, system reliability impacts, customer demand, and the consequences of asset failure. Where appropriate, consideration is also given to the potential cost and customer impact of deferring investment.

RSL applies a risk-based planning approach, recognizing that not all assets present the same level of risk or consequence to customers. Asset prioritization considers factors such as age, condition, utilization, failure history, and the number of customers affected by potential outages. For higher-risk assets or system segments, additional weight is placed on reliability and safety outcomes.

Local drivers are also incorporated into planning decisions through ongoing engagement with customers, municipal councils, municipal staff, and developers. While large-scale subdivision development activity was limited prior to 2021, development activity has increased in recent years. At the time of this DSP, RSL is supporting multiple residential developments at varying stages of advancement, along with smaller infill projects across its service territory. Development lead times are often short and can be difficult to forecast with precision; accordingly, RSL emphasizes flexibility and coordination in its planning processes.

RSL's capital planning criteria are intended to balance reliability, affordability, and system access. Investments are paced to maintain system performance while moderating customer bill impacts. As part of this DSP, RSL is continuing to refine its capital prioritization framework, including the use of consistent evaluation criteria and weighted factors, to support transparent and repeatable decision-making.

1.4.3. Project Rating and Prioritization

RSL capital projects frequently include multiple asset categories within a single scope of work. For example, to improve efficiency and reduce customer disruption, pole replacements may be coordinated with associated conductor and transformer replacements and delivered as a single integrated project. While projects may span multiple asset classes and OEB investment categories, each project is assessed holistically to ensure that planning, prioritization, and reporting remain transparent and consistent.

To support objective and repeatable decision-making, RSL applies a structured process to rate and rank capital projects using criteria consistent with guidance from the Ontario Energy Board. Projects are evaluated across the following factors:

a. Safety
b. Environmental considerations
c. Efficiency, customer value, and reliability
d. Coordination and interoperability
e. Economic development considerations
f. Cybersecurity and privacy considerations

Each factor is assigned a weighting, and projects are scored using a defined rating scale. The combined weighted score produces a total project "health score" out of 100.

Projects with higher scores generally reflect greater alignment with RSL's planning objectives and higher relative priority, while lower-scoring projects may be deferred where appropriate.

Weightings are periodically reviewed to ensure continued alignment with system conditions and regulatory expectations.

Table 6 - Factor Rating Framework

Factor	Rating	Weight	Health Score
Safety	1 to 4	6	24
Environmental Benefits	1 to 4	4	16
Efficiency, Customer Value, Reliability	1 to 4	5	20
Co-ordination, Interoperability	1 to 4	4	16
Economic Development	1 to 4	4	16
Cyber-security, Privacy	1 to 4	2	8

The following detailed rating framework illustrates how each factor is applied in practice. Each factor is assigned a weight and corresponding rating scale, producing a total project health score out of 100.

Table 7 - Environmental Benefits Rating

Environmental Benefits	Rating
No environmental impact	1
Conservation Efforts	2
Clean Technology	3
PCB	4

Table 8 - Efficiency, Customer Value, Reliability Rating

Efficiency, Customer Value, Reliability	Rating
No customer / reliability impact	1
Low outage risk (single TX)	2
Medium outage risk (commercial, <500 res)	3
High outage risk (critical, industrial, over 500 res)	4

Table 9 - Co-ordination, Interoperability Rating

Co-ordination, Interoperability	Rating
No co-ordination or interop. impact	1
Customer coordination	2
Third Party	3
Regional / municipal impact	4

Table 10 - Economic Development Rating

Economic Development	Rating
No economic dev impact	1
Minimal economic dev impact	2
Significant economic dev impact	3
Immediate economic dev impact	4

Table 11 - Cyber-security, Privacy Rating

Cyber-security, Privacy	Rating
No cyber- security, privacy impact	1
Potential cyber/security, privacy impact	2
Minimal cyber- security, privacy impact	3
Cyber threat - risk to customer data	4

1.4.4. Capital Planning and Budgeting

Capital needs are identified through RSL's asset management and planning processes and compiled into a portfolio of candidate projects. Capital budgeting is developed using a combination of bottom-up and top-down approaches to ensure both technical rigor and financial discipline:

Bottom-up:
Asset-level assessments identify required projects, including non-discretionary work (e.g., safety, compliance, end-of-life replacement) and discretionary projects informed by risk and customer impact.

Top-down:
Aggregate spending levels are reviewed against historical capital levels, customer bill impacts, shareholder investment considerations, and alignment with the Ontario Energy Board-deemed capital structure and return parameters.

The resulting capital plan is reviewed by senior management and presented to the Board of Directors for approval. The approved capital budget establishes the annual spending envelope.
RSL conducts quarterly capital reviews to monitor progress and, where necessary, reallocate funding among projects while maintaining the overall approved capital envelope. This approach provides flexibility to respond to emerging non-discretionary requirements, such as storm response, municipal road relocations, or engineering refinements, without increasing total approved spending.

1.4.5. Continuous Improvement and Collaboration

RSL recognizes the importance of continuous improvement in inspection practices, data quality, and supporting systems to strengthen asset management and capital planning outcomes.

Asset information is centrally maintained within RSL's databases and forms the foundation for asset condition assessment, risk evaluation, and project identification. RSL continues to refine its planning processes with the objective of improving consistency, transparency, and repeatability in decision-making. Over time, RSL intends to enhance its ability to assess asset condition and risk at the feeder or feeder-segment level to further support prioritization.

As part of this continuous improvement effort, RSL plans to modernize its asset data environment over the next several years by transitioning from legacy CAD- and spreadsheet-based tools to a cloud-based geographic information system platform, such as Esri. This transition is intended to improve data integration, accuracy, and accessibility. Any associated investments will be phased and assessed through RSL's capital planning and budgeting processes and reflected in regulatory filings as appropriate.

1.5. Investment by Category

In developing its long-term DSP, RSL's objective is to make timely investments in infrastructure to ensure its distribution system continues to deliver power at the quality and reliability levels required by its customers. Details of the forecast for capital expenses can be seen below.

RSL tracks its capital spending in both the traditional system USoA and the RRFE categories (System Access, System Renewal, System Service, and General Plant).

Table 12 - Planned Capital Investment: 2022 Settlement to 2027 DSP (Table 2-AB)

Category	2022	2023	2024	2025	2026	2027
System Access	$813,410	$565,603	$487,458	$925,378	$2,347,458	$307,030
Planned 2021DSP	*$128,000*	*$128,000*	*$128,000*	*$128,000*	*$128,000*	*NA*
System Renewal	$105,921	$59,847	$309,612	$532,926	$696,987	$637,670
Planned 2021DSP	*$835,012*	*$758,000*	*$593,000*	*$537,000*	*$145,000*	*NA*
System Service	$334,397	$968,787	$79,804	$43,461	$770,000	$1,079,229
Planned 2021DSP	*$-*	*$49,000*	*$-*	*$94,000*	*$150,000*	*NA*
General Plant	$62,452	$210,064	$26,576	$53,309	$1,290,628	$65,000
Planned 2021DSP	*$94,000*	*$139,000*	*$89,000*	*$164,000*	*$440,000*	*NA*
Total Capex	$1,316,180	$1,804,301	$903,450	$1,546,075	$5,105,073	$2,088,929
Capital Contributions	-$511,519	-$163,342	-$180,620	-$418,498	-$552,000	-$480,000
Net Capital Expenditures	$804,660	$1,640,959	$722,830	$1,127,577	$4,533,086	$1,608,929
O & M	$782,201	$819,964	$995,724	$1,227,891	$1,272,656	$1,346,180

Observations:

Capital investment levels can vary significantly from year to year for a small utility such as RSL. The overall investment profile is therefore lumpy, particularly where a small number of larger projects can materially affect annual spending.

That said, the general trend is that RSL's capital investment requirements are increasing. This is being driven by several factors, including higher levels of system access work associated with customer connections and local load growth, required system renewal investments, and the increasing cost and complexity of distribution projects.

Several examples illustrate this trend. In 2023, RSL completed the relocation of Morrisburg MS2, which contributed to higher System Service spending in that year. In 2026, RSL is planning significant investment in Iroquois MS2 to improve N-1 resiliency while also adding capacity to support future growth. System Access spending is also elevated in 2026 due to customer-driven projects and related expansion work.

Where operationally feasible, RSL has attempted to defer or stage capital investments to manage rate impacts and align spending with system needs. However, deferral is not always practical where projects are required to connect customers, address capacity constraints, maintain reliability, or renew aging assets. As a result, RSL's DSP reflects a capital plan that balances affordability with the need to maintain a safe, reliable, and responsive distribution system.

Table 13 - Planned Capital Investment: 2028 DSP to 2031 DSP

	2028	2029	2030	2031
System Access	$1,051,582	$816,493	$696,000	$1,009,570
Capital Contributions	-$379,000	-$379,000	-$379,000	-$379,000
System Renewal	$1,054,543	$1,312,389	$1,076,081	$837,847
System Service	$460,000	$515,000	$465,156	$159.252
General Plant	$156,000	$98,000	$496,000	$898,000
Net Capex	$2,523,125	$2,362,992	$2,354,237	$2,525,669

Observations:

RSL's base level of capital investment over the 2028–2031 period is forecast at approximately $2.4 million annually. This reflects the ongoing investment required to sustain the distribution system through planned System Renewal, System Service, and General Plant expenditures.

While capital spending for a utility of RSL's size can be inherently lumpy, efforts have been made within the DSP to level investment over the planning horizon where practical. This approach supports rate stability while ensuring that required system investments are completed in a timely manner.

System Access investment beyond what is currently identified remains uncertain. Although RSL maintains ongoing discussions with developers and municipal stakeholders regarding potential growth opportunities, only projects that are sufficiently defined and reasonably certain have been included in the forecast. The remaining pAs a result, actual capital spending in future years may vary depending on the timing and magnitude of customer-driven connection requests.

Overall, the forecast reflects a prudent and balanced approach, maintaining a stable baseline level of investment while preserving flexibility to respond to future growth and customer needs as they materialize.

2. MAINTENANCE AND PLANNING APPROACHES

2.1. Asset Life

RSL applies depreciation rates consistent with the most recent asset depreciation study prepared by Kinectrics. RSL is not proposing any changes to approved depreciation rates for any asset classes as part of this Distribution System Plan.

While depreciation rates establish accounting lives for regulatory purposes, RSL's operational asset management practices are not driven solely by depreciable life. Where appropriate and supported by condition and performance information, RSL seeks opportunities to safely extend the in-service life of assets through preventive maintenance and targeted refurbishment. These decisions are made with due regard to safety, reliability, regulatory requirements, and customer impact, and are intended to moderate long-term system costs without increasing operational risk.

2.2. Asset Lifecycle Optimization and Practices

RSL manages its distribution assets using a life cycle–based approach that seeks to maximize asset value (minimize costs) while maintaining safety, reliability, and affordability for customers. Asset life cycle management considers the full progression of assets from planning and installation through operation, maintenance, renewal, and eventual retirement.

RSL does not rely solely on asset age to trigger replacement. Asset renewal and refurbishment decisions are informed by a combination of condition assessments, inspection results, performance history, failure risk, and the potential consequence of failure to customers. Preventive maintenance activities—including inspections, testing, vegetation management, and targeted component replacement—are used to extend asset service life where it is prudent and where risk remains acceptable. Asset life extension is only pursued where inspection results, loading, and performance history indicate that safety and reliability risks remain within acceptable thresholds.

Asset life cycle optimization emphasizes balancing planned and unplanned outages. Where feasible, RSL prioritizes planned maintenance or replacement activities to reduce the likelihood of unplanned outages, recognizing that unplanned outages typically result in greater customer disruption and higher restoration costs. Where condition indicators or risk thresholds are exceeded, assets are prioritized for replacement to mitigate safety and reliability risks.

RSL also considers opportunities to coordinate asset renewal with other work, such as conductor replacement, transformer replacement, and municipal infrastructure projects.

This coordinated approach reduces total life cycle cost, improves construction efficiency, and minimizes customer disruption.

For assets approaching end of life, RSL evaluates alternatives including continued maintenance, refurbishment, or replacement. Decisions are based on the relative cost, risk, and expected performance of each option, with the objective of maintaining acceptable reliability while moderating customer bill impacts.

As part of its continuous improvement efforts, RSL is enhancing the consistency and transparency of asset condition assessment and risk evaluation. Over time, this includes improving the ability to assess asset health at the feeder or feeder-segment level to support prioritization and long-term planning.

2.3. System Capability (REG & DER)

Over the past two years, Rideau St. Lawrence Distribution Inc. (“RSL”) has connected a total of 14 Distributed Energy Resources (DERs) and one Renewable Energy Generation (REG) facility.

The DER connections consist primarily of micro-generation installations within a new Westport subdivision. The REG connection is a non-injecting solar installation, designed to offset incremental load without exporting energy to the distribution system.

At present, all feeders within RSL’s service territory are subject to generation constraints.

In the Westport area, feeder limitations are driven by the cumulative level of DER and REG capacity connected to the feeder. These constraints are established by Hydro One as the host distributor. RSL is actively working with Hydro One to complete a Connection Impact Assessment (CIA) to evaluate the potential for additional DER capacity.

Should the CIA identify available capacity, the associated upgrade costs are expected to be recovered through DER connection charges, consistent with RSL’s Conditions of Service. Any newly available capacity will be allocated on a first-come, first-served basis, in alignment with Ontario Energy Board policy.

In the Cardinal, Iroquois, Morrisburg, and Williamsburg areas, RSL’s system is supplied from Hydro One’s Morrisburg Transformer Station (TS). In these areas, generation constraints are driven by upstream thermal capacity limitations at the Hydro One Morrisburg TS, which restrict both injecting and non-injecting DER connections.

RSL is actively participating in the regional planning process led by Hydro One and the IESO to identify potential solutions to this constraint. At this time, no firm scope, timing, or cost estimates have been established for upstream capacity upgrades. Accordingly, no related capital expenditures have been included in this DSP.

2.4. Non-Wires Solutions (NWS)

RSL considers non-wires solutions ("NWS") as part of its system planning activities. Given the size of the utility, this assessment is conducted through internal discussions between operations staff and management, supported by ongoing monitoring of industry developments and emerging NWS applications across the sector.

Where potential opportunities are identified, RSL will engage qualified third-party engineering support to further assess feasibility, including technical applicability and cost effectiveness.
RSL's system characteristics, specifically its small customer base, limited load density, and reliance on upstream supply from Hydro One, significantly constrain the viability of NWS. In most cases, system needs are driven by firm capacity requirements (e.g., transformer station capacity) which require reliable and continuous supply that cannot be practically met through demand-side or distributed alternatives.

As part of its planning for the Iroquois station, RSL considered whether NWS could defer or replace the need for traditional infrastructure. This assessment determined that there are no cost-effective NWS options capable of providing equivalent capacity, reliability, and operational certainty when compared to the installation of a second transformer station.

Accordingly, while RSL will continue to monitor developments in NWS and assess opportunities where appropriate, the application of NWS within its service territory is expected to remain limited.

2.5. Climate Vulnerability & System Hardening (Best Efforts)

RSL has conducted a high-level climate vulnerability assessment of its distribution system, considering both evolving climate conditions in Eastern Ontario and the associated risks to system performance and reliability. This assessment evaluates both the likelihood of climate-driven impacts and the consequences to customers and system operations.

Climate trends in Eastern Ontario indicate:

- Increasing average temperatures and milder winters
- A transition from historically winter-peaking to summer-peaking demand, driven primarily by increased air conditioning load

- Increased frequency and severity of extreme weather events, including heat waves, tornadoes, and severe windstorms

These changes have increased stress on system assets and heightened the importance of reliability and resiliency planning.

Based on this assessment, RSL has identified key system vulnerabilities and incorporated targeted investments within this DSP to mitigate associated risks.

Key Vulnerabilities and Mitigation Measures

1. Station-Level Vulnerability (Single Contingency Risk)
   The Iroquois service area represents the only portion of RSL's system that is not N-1 compliant at the transformer station level, creating a single point of failure with potentially significant customer impact.
   To address this vulnerability, RSL has included the development of a second transformer station in Iroquois, which will:

   - Eliminate the single contingency risk
   - Improve system reliability and restoration capability
   - Align this service area with the redundancy present in other RSL-served communities

2. Vegetation and Extreme Weather Exposure
   Increased vegetation growth rates and more frequent severe weather events are expected to drive higher incidence of tree-related outages, which are already a primary contributor to reliability performance.
   To mitigate this risk, RSL is:

   - Increasing its vegetation management program funding to maintain greater clearances from energized infrastructure
   - Transitioning back-lot construction to front-lot configurations where feasible during system renewal projects, improving accessibility and reducing vegetation exposure
   - Upgrading protection from fuse-based isolation to reclosers, improving outage response and reducing customer impact

3. System Monitoring and Automation
   RSL is advancing the deployment of SCADA and SCADA-capable devices to improve system visibility and operational response.
   These investments will:

   - Enable faster identification of outages
   - Support remote switching and restoration
   - Improve overall system responsiveness during extreme weather events

4. Feeder-Level Redundancy (Radial System Constraints)

   RSL's distribution system is largely radial, and several feeders are not N-1 compliant. While this represents a vulnerability, the consequence of feeder-level contingencies is generally lower than station-level failures due to:

   - Smaller customer group impacts
   - Faster restoration timelines through switching and field response

   Given the relatively high cost of achieving feeder-level redundancy compared to the incremental reliability benefit, these investments have been assessed as lower priority and are not included in this DSP cycle.

Summary

RSL's climate vulnerability assessment indicates that the most material risks to system reliability are:

- Station-level single points of failure
- Increasing vegetation-related outages driven by climate conditions
- Limited system visibility and automation

The investments outlined in this DSP are targeted to address these priority risks in a cost-effective manner, while recognizing the practical constraints of a small, rural distribution system.

3. ASSET CATEGORIES AND MANAGEMENT

The distribution network includes 9 distribution stations at the time of writing and 10 by the end of 2026 which are owned by RSL and two stations that are shared with Hydro One Networks Inc. (HONI). The system consists of 18 km of underground lines, 101 kilometers of overhead lines supported by 2069 poles and 939 utility owned transformers.

This section summarizes the results of the asset condition as of 2025, with the objective of establishing the health and condition of fixed assets currently in service in RSL's system.

The assets covered by the report include:

a) Substations/Feeders
b) Distribution Transformers
c) Poles
d) Conductors
e) Switches
f) Meters
g) Fleet

3.1. Substations

Rideau St. Lawrence Distribution Inc. (RSL) owns and operates nine distribution substations, with a tenth station on track to be in service by the end of 2026. These stations located within municipal limits across its service territory, as illustrated in the station schematic. Each station is connected through appropriately rated load-break or air-break switching devices.

Table 14 - RSL Substation Schematic

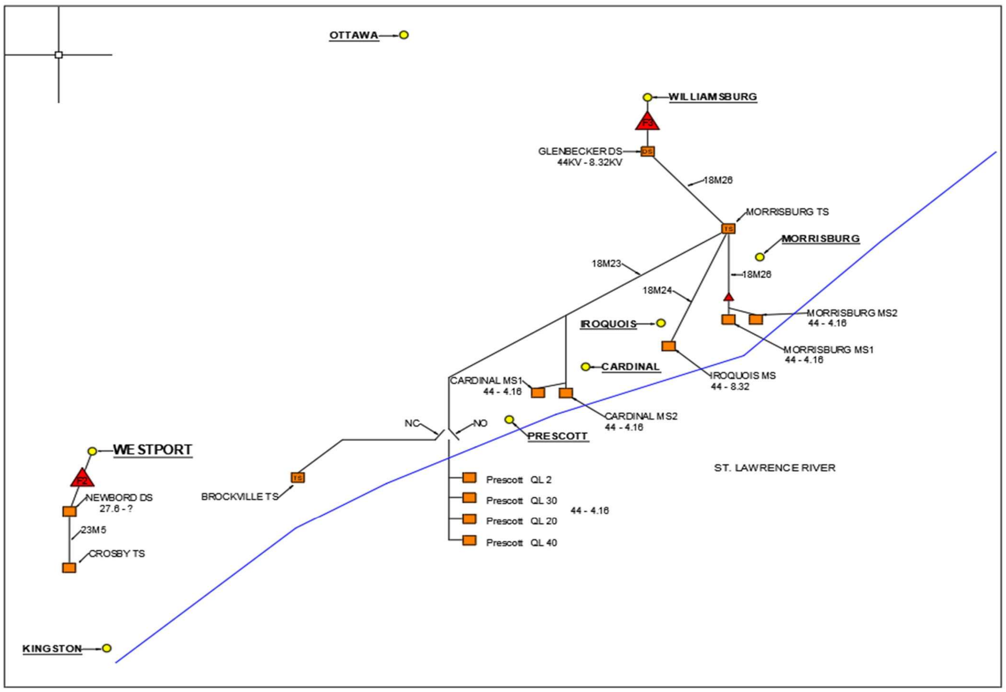


Table 15 - Station Schematic

Station	Year Energized	Voltage	Transformer Size	No. of Feeders	HV Protection	LV Protection
Cardinal MS1	Jun 1953	44-4.16 kV	3.0 MVA	2	65E	400A Fuses
Cardinal MS2	Sep 1996	44-4.16 kV	3.0 MVA	2	65E	400A Fuses
Iroquois MS1 (backup tx)	Feb 2016 (T2) Jun 1953 (T1)	44-8.32 kV 44-8.32 kV	3.0 MVA 3.0 MVA	2	100E 100E	400A Reclosure 400A Fuses
Iroquois MS2 (new)	2026	44-8.32 kV	4.0 MVA	1	65E	400A Recloser
Morrisburg MS1	Sep 1976	44-4.16 kV	5.0 MVA	3	150E	400A Recloser
Morrisburg MS2	Oct 2023	44-4.16 kV	5.0 MVA	3	150E	400A Recloser
Prescott MS1/QL2	1965	44-4.16 kV	3.0 MVA	3	SMD-50	400A Fuses
Prescott MS2/QL20	Jun 1954 Refurb 2017	44-4.16 kV	5.0 MVA	2	80E	400A Fuses
Prescott MS3/QL40	June 1963	44-4.16 kV	5.0 MVA	4	100E	400A Fuses
Prescott MS4/QL30	Oct 1991	44-4.16 kV	5.0 MVA	2	60E	400A Recloser

3.1.1. Station Summary

Cardinal

Cardinal MS1 – 715 Highway #2:
Cardinal Sub-station #1 primarily provides residential service to the part of town north of Highway #2. The transformer is on track to be replaced in 2026 and is an ONAN/ONAF 3.0/4.0 MVA transformer. The substation has two feeders, of which only one is being used. The station is currently protected by 400A fuses on the LV side and 65A Type E power fuses on the HV side. A new switching cabinet was installed in 2014. It also contains a Meter Compartment. This station has been providing Cardinal with power since 1953.

Cardinal MS2 – 3037 John Street:
Cardinal Sub-station #2 provides service to almost everything south of Highway #2, which includes a mix of both residential and industrial customers. The transformer is a 3.0MVA and has two feeders all protected by 400A fuses on the LV side and 65A Type E power fuses on the HV side. This station was placed in service in 1996.

Iroquois

Iroquois MS1 – 5799 Country Road:
Iroquois Sub-station #1 provides power to a mixture of residential and industrial customers. The transformer is a 3.0MVA and has two feeders, one protected by 400A fuses and the other protected by a 400A recloser on the LV side and 100A Type E power fuses on the HV side. This station has been in service since 1953. In 2016, a second transformer was installed to improve reliability in case of a transformer failure.

RSL now uses this new transformer as the primary with the older transformer as backup.

Recent assessment by a third party determined that the older backup transformer to be in poor condition. RSL plans on changing the strategy of relying on the older transformer as backup. In 2026 RSL will be adding Iroquois MS2 for new capacity and to utilize it as a back-up for the load town's load in case of emergency.

Iroquois MS2 – 10739 County Rd 2:
Iroquois MS2 on track to be in service in 2026. The transformer is an ONAN/ONAF 3.0/4.0 MVA transformer. The substation has one feeder protected by a 400A recloser on the LV side and 65A Type E power fuses on the HV side.

Morrisburg

Morrisburg MS1 – 9 Fifth Street East:
Morrisburg Sub-station #1 provides service to the east part of Morrisburg. Its customers are a mix of residential, commercial and industrial customers. The substation has a 5.0MVA transformer and three feeders protected by 400A reclosers. This station is protected by 150A Type E power fuses and has been in place since 1976.

Morrisburg MS2 – 9 Fifth Street East:
Morrisburg Sub-station #2 was installed adjacent to MS1 in 2023 and provides service to the west and north part of Morrisburg. It is used to serve a mixture of residential, commercial and industrial customers. The substation has a 5.0 MVA transformer and three feeders protected by 400A reclosers. HV protection is provided by 150A Type E power fuses.

Prescott

Prescott MS1 – 675 Corrine Street:
Prescott Sub-station #1 has a 3.0MVA transformer with three feeders protected by 400A fuses. The station's HV side protection is provided by SMD-50 power fuses. Two of the feeders are used to service a mixture of residential, industrial and commercial customers on Sophia Street, Ann Street and everything west of Edward Street South on King Street East, Henry Street West, Dibble Street West and James Street West. The third feeder provides service to a park and parts of downtown, Water Street, and King Street. This station was installed in 1965.

Prescott MS2 – 101 Churchill Road:
Prescott Sub-station #2 is used to service mostly commercial central portion of the town. The service area includes Churchill Rd W, Industrial Rd. and Development Dr. The transformer is a 5.0MVA unit with two feeders protected by 400A fuses, with only

one feeder used. The HV protection for this station is provided by 80A Type E power fuses. This sub-station has been providing Prescott with power since 1954 and shares the same yard as Prescott MS3.

Prescott MS3 – 101 Churchill Road:
Prescott Sub-station #3 primarily provides service to the north-western portion of the town. This area contains industrial, commercial and one residential subdivision and includes everything north of the rail line and west of Edward Street North. The transformer is a 5.0MVA and has four feeders, with only three feeders being used. It is protected on the LV side by 400A fuses and on the HV side by 100A Type E power fuses. Prescott MS3 was added to Prescott MS2 in 1963.

Prescott MS4 – 800 Boundary Street:
Prescott Sub-station #4 provides service to the eastern portion of the town. North of the rail line this includes all the residential area east of Edward Street North; south of the rail line it includes everything East of Prince Street. The transformer is a 5.0MVA unit and provides power for two feeders protected with 400A reclosures. The station's HV side protection is provided by 60A Type E fuses. The transformer was installed in 1991.

Williamsburg

There is no RSL owned substation in this service area. Williamsburg is supplied directly at 8.32kV by Hydro One from the Glen Becker DS F3 feeder.

Westport

There is no RSL owned substation in this service area. Westport is supplied directly at 8.32kV by Hydro One from the Newboro DS F2 feeder.

3.1.2. Stations Inspection and Maintenance

Inspection

Rideau St. Lawrence Distribution Inc. owns and operates its nine substations, which are inspected on the first business day of each month. Patrols at substations require the use of the "Record of Substation Inspection" which includes a checklist of items to inspect visually for defects. Monthly visual inspections include the following:

Transformer:

- Paint condition and corrosion
- Oil Leaks
- Insulator Condition
- Bushing contamination
- Ground lead attachments

Switches and Protective Devices:

- Bent, broken bushings and cut-outs Damaged lightning arresters
- Ground wire on arresters unattached

Hardware and Attachments:

- Loose or missing hardware
- Insulators unattached from pins
- Conductor unattached from insulators
- Insulators flashed over or obviously contaminated
- Tie wire unraveled
- Ground wire broken or removed
- Ground wire guards removed or broken

Switchgear:

- Paint condition and corrosion
- Placement on pad or vault
- Check for locks
- Grading changes Leaking oil

Vegetation:

- Accessibility compromised
- Grade changes that could expose cable

- Leaning or broken “danger” trees in proximity of station
- Growth into line of “climbing” trees
- Vines or brush growth interference (line or fence clearance)
- Bird or animal nests

Every five years, RSL engages a third-party firm to conduct a comprehensive station condition assessment covering transformers, switchgear, infrastructure, and redundancy. The results feed directly into RSL’s asset ranking system.

The inspections and asset ranking help identify projects that require to be completed in the next 5 years.
Some of the material projects identified include:

- Replacement of Cardinal MS1 Station Transformer
- Replacement of Iroquois MS1 Air Brake Switch

Maintenance

Preventive station maintenance is conducted on a three-year cycle according to the RSL Inspection and Maintenance Procedures and includes the following:

- Transformer testing
- Arrester testing
- Protection and breaker testing
- General station maintenance
- Condition-based oil sampling

Over the past five years, the following general maintenance activities have been completed:

- Fence repairs at Prescott MS1 and Prescott
- MS2 Replacement of grounding conductors at Prescott MS3
- Fence repairs at Prescott MS4
- Installation of new fencing at Morrisburg MS1
- Vegetation management within station yards
- Ongoing transformer oil sampling and analysis
- Transformer oil replacement at Prescott MS1

Non-material general maintenance activities will include:

- Station labelling and nomenclature standardization
- Station yard and surface resurfacing
- Fencing
- Continued execution of the regular preventive maintenance program outlined above

Load and Load Balancing

Historically, RSL experienced minimal station load growth. In 2025, peak demand increased significantly, prompting a third-party system capacity study. The study concluded that most stations have adequate capacity for the next 5–10 years. However, the following areas require attention:
Iroquois requires a second station due to capacity constraints.

1. Cardinal MS1 requires feeder load balancing.
2. Morrisburg will require a new station and feeder balancing within 5–10 years.

Table 16 - RSL station and feeder load study in 2025

Station Name	Station Load	Feeder 1 Load	Feeder 2 Load	Feeder 3 Load	Feeder 4 Load
Cardinal MS1	45%	75%	Spare	NA	NA
Cardinal MS2	40%	26%	41%	NA	NA
Iroquois MS1	95%	25%	41%	NA	NA
Iroquois MS2 (new)	TBD	TBD	TBD	NA	NA
Morrisburg MS1	31%	32%	18%	10%	NA
Morrisburg MS2	63%	42%	45%	70%	NA
Prescott MS1/QL2	57%	26%	31%	37%	NA
Prescott MS2/QL20	22%	Spare	50%	NA	NA
Prescott MS3/QL40	59%	36%	35%	56%	Spare
Prescott MS4/QL30	31%	28%	43%	NA	NA
Westport	NA	63%	NA	NA	NA
Williamsburg	NA	32%	NA	NA	NA

3.1.3. Station Asset Condition

The major assets reviewed in Substations include only the station transformer at this time. The overall Health Index of RSL’s substation equipment was calculated using the above variables and is summarized in the Table below.

Table 17 – Station Heath Assessment

Station	Age	Stress	Condition	Oil Test	Total Score	Asset Condition
Cardinal MS1	20	5	15	40	80	Critical
Cardinal MS2	10	5	20	40	75	Poor
Iroquois MS1	5	20	10	10	45	Good
Iroquois (Spare)	20	5	10	10	45	Good
Morrisburg MS1	15	5	10	10	50	Good
Morrisburg MS2	5	10	5	10	30	Excellent
Prescott MS1	15	10	10	20	55	Fair
Prescott MS2	5	5	20	30	60	Good
Prescott MS3	15	10	15	10	50	Good
Prescott MS4	5	5	15	20	40	Good

RSL condition score for station equipment is calculated using a weighted evaluation of four variables: asset age, transformer loading (stress), inspection results, and testing results. The scores range from 0-100 with the higher scores indicating poorer condition and higher replacement priority.

Table 18 – Health Rating

Rating	Asset Description Health	
Excellent	0 – 40	No action required
Good	41 – 60	Reassess within 5 years
Poor	61 – 75	Replace within 7 years
Critical	76 – 100	Replace immediately

Health

The four variables used for the assessment were each assigned a range of health scores and an overall weighting per health score. A maximum score would indicate an immediate need for replacement. The table below identifies the weighted scaling.

Table 19 – Health Variable

Station Health Variable	Rating	Weight	Health Score
Age	1 to 4	5	20
Loading (stress)	1 to 4	5	20
Visual Inspection	1 to 4	5	20
Tests	1 to 4	10	40

Age

RSL currently operates nine stations, with one spare transformer in Iroquois MS. The Health Score assigned for the age range for each station is identified in the table below.

Table 20 - Age

Year	Age	Rating
2001 – 2026	0 - 25	1
1981 – 2000	26 –	2
1961 – 1980	46 –	3
1960 and older	66 +	4

Transformer Loading (Stress):

RSL monitors the station load monthly. All stations are lightly loaded, consistent with the overall system utilization factor. The table below shows the Health Score assigned based on the transformer load, representing the stress or equipment utilization.

Table 21 – Station Load

Load (% of rated)	Rating
< 50	1
51 –	2

75 –	3
>95	4

Visual Inspection

RSL completes visual inspections as per section 3.1.2.1 above and the OEB's DSC requirements of its plant and performs predictive testing on certain assets where such testing is available, and replaces assets based on inspection and testing results as required. In addition, inspections from 3rd parties are also factored into the results.

Table 22 – Inspection Results

Inspection Results	Rating
No issues	1
One issue	2
Two issues	3
More than two issues	4

Oil Sampling

Transformer oil samples are submitted to third-party laboratories to assess oil quality and predict transformer condition. Results are analyzed and scored using the following rating scale.

Table 23 - Oil Sampling

Old Sample Results	Rating
No issues	1
One issue	2
Two issues	3
More than two issues	4

Summary

Overall, RSL substations are generally in good condition, largely due to the light transformer loading. However, several assets are aging and have been identified for renewal or replacement within the planning horizon. RSL will continue regular inspection, testing, and condition monitoring, which may identify additional requirements over time.

During this reporting period, five major material station-related projects are planned, supported by additional minor maintenance initiatives:

Installation of additional capacity and resiliency for Iroquois through a second station

- Cardinal System Interties
- Switch Gear Replacement
- System renewal for Cardinal MS1 Station Transformer

Station Protection and Monitoring

Rideau St. Lawrence Distribution Inc. (RSL) operates nine distribution stations serving six geographically separated communities. The distribution systems are electrically isolated, fully embedded within Hydro One Networks Inc.'s system, and provide limited redundancy between communities. As a result, station-level protection and monitoring performance is a critical determinant of outage frequency, duration, and asset risk.

Five of RSL's stations currently operate without automatic circuit reclosers, while the remaining four rely on aging and functionally limited reclosers. This configuration increases exposure to:

Transformer damage during fault events.

Prolonged outages requiring manual isolation and restoration.

Increased crew response times during severe weather events.

Climate-driven increases in severe weather frequency and intensity have further amplified these risks. The current protection and control configuration no longer aligns with modern distribution system resiliency expectations or prudent utility practice.

The existing station protection and monitoring infrastructure presents the following deficiencies:

- Limited ability to automatically clear temporary faults.
- Minimal real-time visibility into feeder and station conditions.
- Dependence on manual switching and field dispatch during outages.
- Increased likelihood of cascading interruptions and equipment damage.
- These limitations negatively impact:
- SAIDI and CAIDI performance during major events.
- Crew safety due to increased emergency response requirements.
- Customer reliability outcomes across all six communities.

RSL has a multi-year capital program focused on modernizing station protection and monitoring infrastructure through the following integrated components:

Automatic Circuit Reclosers

- Installation of modern reclosers at station and feeder exits.
- Rapid isolation of temporary and permanent faults.
- Reduced exposure of transformers and downstream assets to fault currents.

Automated Switching Devices

- Deployment of automated feeder sectionalizing and switching.
- Isolation of faulted segments without manual intervention.
- Restoration of healthy feeder sections within minutes rather than hours.

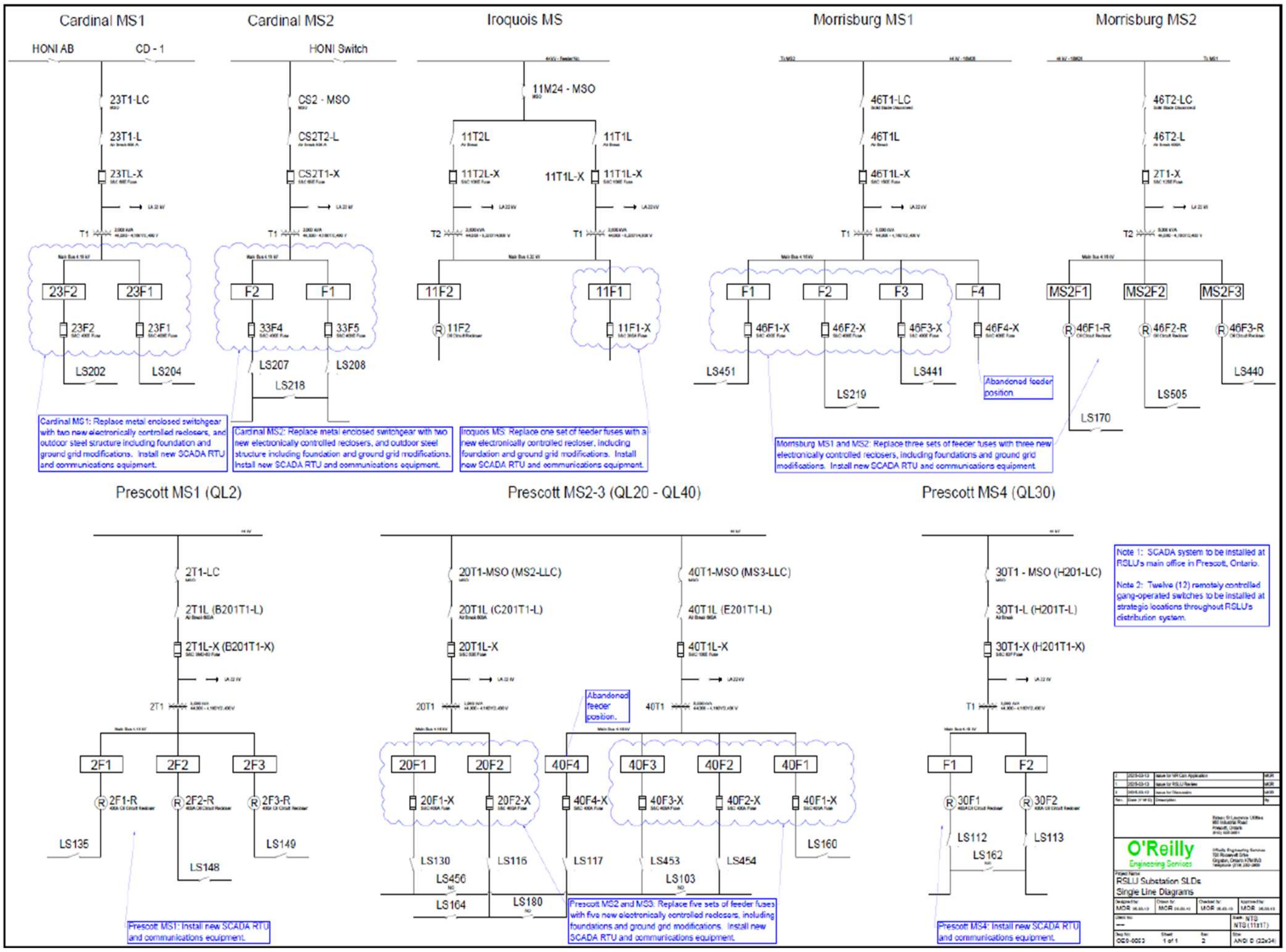
SCADA-Enabled Monitoring and Control

- Expanded SCADA coverage for stations and feeders.
- Real-time fault detection, alarms, and system visibility.
- Remote switching capability to support fault location, isolation, and service restoration (FLISR).

This strategy materially improves the system's ability to withstand and recover from outage events while reducing reliance on reactive field operations.

At the same time, RSL was able to secure NRCAN funding grant. Currently we are in the due diligence stage. With the grant, the execution of the project will be condensed.

Table 1 - RSL NRCAN Investment System Schematic



3.2. Transformers

3.2.1. Transformer Summary

The RSL distribution system consists of 939 distribution transformer units. These units are configured in single-phase and three-phase installations and include 809 pole-mounted and 130 pad-mounted transformers. The distribution of transformer installations by community is shown in Table 22.

Current transformer registry data includes size, type, manufacturer, and serial number. Manufacturing year is available for approximately 15% of the transformer population. Where available, manufacturing year has been used as a proxy for purchase and installation year for the purpose of this DSP. For transformers without manufacturing year, RSL uses field observations and visual indicators from inspections to support reasonable vintage estimates.

The following tables show a summary of the overhead and underground transformer data by municipal area.

Table 24 – Transformer Unit Data

Community	Polemoun	Padmoun	PoleTra
Cardinal	97	12	0
Iroquois	101	28	
Morrisburg	195	24	
Prescott	302	37	0
Westport	87	26	
Williamsburg	27	3	
Total	**809**	**130**	**0**

*Results on the Pole Trans are based on the plan to remove the remaining pole trans in in the system.

Industry practice over the past 25 years has generally resulted in transformers being oversized relative to average customer demand. Typical utility transformer utilization factors range from 30% to 35%. RSL system analysis indicates an average transformer utilization factor of approximately 33%, consistent with industry norms.

All transformer installations are fused at approximately 80% of rated amperage. This practice protects transformers from sustained overload conditions and contributes to extended service life.

RSL's asset management system is manually compared with customer and smart meter data, allowing transformer loading and utilization to be assessed more accurately and supporting improved identification of stressed assets.

3.2.2. Transformer Inspection and Maintenance

Maintenance

Transformers are replaced annually as part of both maintenance activities and capital projects driven by broader system improvements. Over the past five years, approximately 60 transformers have been replaced due to PCB concentrations exceeding 50 ppm. With many of the larger transformers being replaced with smaller transformers due to the previous Conservation Demand Management work.

Additionally, RSL has made a significant dent into replacing the life front transformers and Pole mounted transformers with a couple of projects remaining.

Over the last 5 years RSL has replaced 128 transformers. IN addition to the PCB transformer listed above, RSL replaced transformers in critical condition, or transformers in poor condition that were part of a larger project for system renewal or system access.

Based on historical experience and industry benchmarks, RSL anticipates replacing approximately 1% to 2% of the transformer population annually for renewal purposes.

Transformer Condition Assessment

RSL assesses transformer condition using a weighted scoring methodology based on age, loading (stress), and visual inspection results. Scores range from 0 to 100 and correspond to required actions as shown in Table 22. The table below cross-references the asset score with a rating and required action.

Table 25 – Overall Transformer Assessment

Rating	Asset Score	Description
Excell	0 – 40	No action required
Good	41 – 70	Re-assess within 5 years
Poor	71 – 85	Replace within 7 years
Critic	85 – 100	Replace immediately

Health

The three variables used for the assessment were each assigned a range of health scores and an overall weighting per health score. A maximum score would indicate an immediate need for replacement. The table below identifies the weighted scaling.

Table 26 – Transformer Health Variables

Variable		Rating	Weight He
Age	1 to 4	5	20
Visual Inspection	1 to 4	5	20
Loading (stress)	1 to 4	15	60

Age

The RSL distribution system consists of 939 transformers in service. Age information is developed from a combination of recorded installation data and manufacturing year where available. Because manufacturing year is only available for approximately 15% of the population, RSL also uses inspection observations and transformer design indicators to support reasonable vintage estimates where registry data is incomplete.

Most units are single-phase overhead transformers, with some banked for three-phase operation. While RSL has experienced increased development activity in recent years, overall development remains moderate and the system continues to have a relatively low population of pad-mounted transformers. Three-phase pad-mounted transformers are the standard for larger commercial installations, while smaller commercial installations may continue to be supplied by overhead transformer banks where site constraints exist.

The Health Score assigned for the age range for each transformer is identified in Table 24.

The Health Score assigned for the age range for each transformer is identified in Table 23.

Table 27 – Transformer Age Rating

Year	Age	Rating
1985 – 2014	0 - 29	1
1970 – 1984	30 –	2
1955 – 1969	45 –	3
1954 and older	60 +	4

Transformer Loading (Stress)

RSL uses the available Smart Meter Data, linked to their GIS connectivity model to determine the loading on distribution transformers. The table below shows the Health Score assigned based on the transformer load, representing the stress or transformer utilization.

Table 28 – Transformer Loading Rating

Load (% of rated)	Rating
< 50	1
51 –	2
75 –	3
>95	4

Based on smart meter loading information, approximately 90% of transformer locations are loaded at 33% of rated capacity or less. As a result, transformer replacements are more commonly driven by physical condition, mechanical deterioration, safety factors, PCB remediation, and coordinated system renewal projects rather than by electrical overload.

The replacement program within this DSP period is primarily driven by PCB replacement completion activities and coordinated renewal in areas involving small-conductor replacement, as required.

Visual Inspection

RSL visually inspects transformers every three years under the Overhead Visual Inspection and Underground Visual Inspection Programs, as per OEB's DSC requirements, and records and follows-up on any complaints received from customers.

- Paint condition and corrosion
- Phase indicators and unit numbers match operating map

- Leaking oil
- Flashed or cracked insulators Contamination/discolouration of bushings
- Ground lead attachments
- Damaged disconnect switches or lightning arresters
- Ground wire on arresters unattached

Table 29 – Transformer Inspection Rating

Inspection Results	Rating
No issues	1
One issue	2
Two issues	3
More than two issues or PCB test >50ppm	4

Overall Health

Overall transformer health results reflect differences in asset vintage and installation type across the service area. Pad-mounted transformers, which are more common in newer underground developments, generally skew toward lower (better) health scores. Overhead transformers are more broadly distributed across health score ranges due to older asset vintages and varying environmental exposure.

Transformers with critical health scores are addressed immediately through corrective action or replacement, and other renewal priorities are addressed through coordinated renewal projects where transformers are planned alongside poles and conductors to maximize feeder-level improvement and minimize repeat disruptions.

Overall RSL's transformer health scores can be seen below. With many new developments being underground implementations, most of the padmount transformers skew to better health scores while the more traditional overhead infrastructure is spread out more equally amongst the health scores. Critical scores are addressed immediately.

Table 30 – Overall Transformer Health Scores

	Transformer Health Score			
	Critical	Poor	Good	Excellent
Padmount	0	13	52	65
Overhead	0	227	351	231

3.3. Poles

The RSL overhead distribution system is supported by 2069 poles, as recorded in the database system. The inspections of the poles are conducted by the line crew. Only the height, community, species and condition have been recorded historically. Pole inspections are completed by RSL staff through system patrols on a regular basis.

3.3.1. Pole Inspection and Maintenance

Poles that are identified through reports from line patrols as a potential health and safety hazard to the public and staff, are replaced on a high priority basis. Other factors used to determine the priority of the replacements are the equipment supported by the pole and the results of any pole inspections.

RSL's current standard is to purchase treated poles. Historically a large number of cedar poles were used in both Cardinal and Prescott. These poles now represent a portion of those in bad, poor and fair condition.

It is also recognized that an appropriate replacement program must consider the relationship of the pole asset with other assets in its proximity and within the network system.

Based on the available data and industry norms, RSL anticipates the need to replace approximately 1 - 2.5% of the pole population annually.

Whenever RSL identifies a pole in need of replacement, several poles in one circuit will be replaced if of similar age. This considers the feeder health over individual components.

The definitions of the pole conditions listed in the charts are as follows:

- (New) – New poles are those which have been installed in the last 10 years since age has been recorded. These are expected to survive beyond the next forty-five years.
- (Good) – Poles in Good condition are those that do not immediately need attention. They may need to be replaced in twenty-one to forty-five years.
- (Fair) – Poles listed as being in Fair condition should be considered for replacement in eight to twenty years.
- (Poor) – Poles listed as being in Poor or Bad condition are those that need to be replaced in the next one to seven years.
- (Bad) Poles in Bad conditions are replaced within the 10 day planning cycle

Cedar poles are most likely older as they make up a larger portion of those poles in either bad or poor condition Prescott contains the majority of cedar poles in the RSL system and so the majority of poles in poor or bad condition

RSL has implemented a pole assessment process based on age, condition, pole utilization and stress, based on a design loading calculation. Data currently available suggests that the majority of our pole population is less than 70% loaded based on design calculations.

This data will be completed over time and will assist RSL in future prioritization of pole replacements.

Maintenance

RSL currently relies on pole inspections, supported by pole testing where required, to determine the need for pole replacements. As mentioned previously other factors are taken into consideration when planning for future pole replacement.

The stress placed on a pole is important when considering its lifespan; generally, the greater the stress the shorter the lifespan. Poles supporting equipment such as transformers or conductors that are dead-ended or are supporting large angles are typically under more stress. In addition, poles supporting equipment can cause more disruption to the system than lightly used poles if they fail. It is therefore important that they be more closely monitored.

The above pole inspection process has identified the poles to be replaced during the forecast period.

Bad poles are executed within the 10-day planning cycle. Then Conditions of poles are utilized to select grouped projects. These group projects generally spans over a street. It factors in multiple poles, conductors, and transformers.

Capital

Pole lines with small conductors and backyard poles are planned to be replaced. These constructions typically have older poles, which due to age, and due to increased difficulty to plan with the homeowner, and the coordination of rental backyard derrick machine rentals and/or contractor coordination. Based on the planned conductor replacement, a number of poles will also be upgraded in the process. This provides better customer service and improves system reliability, while reducing the need for more frequent visits to the same area.

3.3.2. Distribution Pole Conditions Assessment

RSL condition score for distribution poles is calculated using a rated weighting of variables. The scoring is based on the age, pole loading (or stress) and a documented visual inspection. The assessment is based on a scoring from 0-100 ranging from Excellent to Critical. The table below cross-references the asset score with a rating and required action.

Table 31 - Pole Rating

Rating	Asset Score	Description
Excellent	0 – 40	No action required
Good	41 – 70	Reassess within 5 years
Poor	71 – 85	Replace within 7 years
Critical	85 – 100	Replace immediately

Health

The three variables used for the assessment were each assigned a range of health scores and an overall weighting per health score. A maximum score would indicate an immediate need for replacement. The table below identifies the weighted scaling.

Table 32 - Pole Health

Variable	Rating	Weight	Health Score
Age	1 to 4	5	20
Visual Inspection	1 to 4	10	40
Loading (stress)	1 to 4	10	40

Age

The RSL distribution system consists of 2069 poles in service, that are identified and tracked in RSL's database. The Health Score assigned for the age range for each pole is identified in the table below. Based on the data 23% of the poles have an age ranking of 1, 55% have a ranking of 2 and 22% have a ranking of 3.

Table 33 - Pole Age

Age	Rating
0 - 29	1
30 – 44	2
45 – 55	3
55 +	4

Pole Loading (Stress)

RSL identified the stress the conductors and equipment exert on the pole as a factor to consider when assessing the condition of the pole. The more stress exerted on the pole, the more impact this has on the condition and more likely the pole fibers will deteriorate over time. RSL has calculated the design stress of a number of typical pole configurations used in their system. For the configurations considered, the design stress is less than 50%.

Table 31 shows the Health Score assigned based on the pole loading or calculated stress, representing the pole utilization.

Table 34 - Pole Load Stress

Load (% of rated strength)	Rating
< 50	1
51 – 74	2
75 – 95	3
>95	4

Based on the above and the sample calculations, majority of the poles in the RSL system have a health score of 1 or 2.

Visual Inspection

Line patrols, conducted in accordance with RSL Procedures, include a visual inspection of poles for the following:

- Bent, cracked or broken poles
- Excessive surface wear or scaling
- Loose, cracked or broken cross arms and brackets
- Woodpecker or insect damage, bird nests
- Loose or unattached guy wires or stubs
- Guy strain insulators pulled apart or broken
- Guy guards out of position or missing
- Grading changes, or washouts
- Indications of burning

In addition, pole testing is used to confirm a condition of a pole, as required. The majority of the poles identified for replacement as part of the proposed five-year plan are driven by the replacement of small conductors in rear lots. The remainder identified are primarily due to their visibly poor condition. The quantities of replacement of this asset class are consistent with the recommended maximum useful life (MUL) and within the fiscal constraints of this plan.

The Health Score assigned for issues identified on inspection are identified in the table below.

Table 35 - Pole Health

Inspection Results	Rating
No issues	1
One issue	2
Two issues	3
More than two issues	4

Overall Health

The overall health score can be seen listed below. Poles are being managed and gradually improved over time.

Table 36 - Pole Conditions Assessment by Community

	POLE CONDITION					
Community	Bad	Poor	Fair	Good	New	**Grand Total**
Cardinal	0	19	80	157	58	314
Iroquois	0	18	51	129	72	270
Morrisburg	0	33	53	237	90	413
Prescott	0	32	120	350	230	732
Westport	0	2	20	210	27	259
Williamsburg	0	1	19	57	4	81
Total	0	105	343	1140	481	2069

Table 37 - Pole Conditions Assessment by Pole Type

	POLE CONDITION					
POLE TYPE	Bad	Poor	Fair	Good	New	**Grand Total**
Cedar	0	83	253	197		533
Pine	0	22	90	943	481	1,536
Total	**0**	**105**	**343**	**1140**	**481**	**2069**

3.4. Conductors, Switches and Metering

3.4.1. Conductors

Conductors are prioritized for replacement based on inspection results and capacity limitations related to load growth. Outside of these drivers, conductor assets at RSL are generally operated on a run-to-failure basis. This differs from other asset classes such as transformers and poles, where both loading stress and age are more direct drivers of end-of-life decision-making.

For conductors, vegetation interaction is a primary contributor to failure risk. As a result, this asset class requires significant ongoing vegetation management to mitigate outages, safety risks, and conductor damage.

Primary

The communities that make up RSL's service territory have evolved independently over time, each with unique infrastructure characteristics and load profiles. Most communities include some level of industrial or commercial load. As a result, RSL historically retained localized pockets of smaller primary conductors, primarily #2 ACSR, where load requirements were modest at the time of construction.

Over time, RSL has systematically prioritized the removal of restricted conductors, specifically:

- No. 4 ACSR
- No. 4 Special ACSR
- No. 6 copper conductors

Based on inspection activities completed in 2026, no restricted conductors remain in service. To provide additional assurance, patrols and inspections over the next three years will be monitored to confirm that no remaining restricted conductors are identified.

With respect to the remaining #2 ACSR conductors, approximately 1.1 km is planned for replacement over the proposed five-year planning period. These replacements have been coordinated with pole and transformer renewal programs, particularly where asset vintage and condition are similar. This coordinated approach minimizes customer interruptions and aligns with RSL's overall project prioritization framework.

RSL uses existing system analysis tools to:

- Assess conductor sizing requirements
- Balance system capacity, line losses, and voltage drop
- Optimize feeder routing for efficiency and reliability

Small conductors (#2 ACSR and smaller) identified for replacement are typically upgraded to current RSL standards, consisting of 3/0 ACSR or 336 mcm ACSR. These conductor sizes provide improved operational flexibility, increased capacity, and enhanced accommodation of future load growth.

Secondary

Secondary conductors are assessed on a case-by-case basis as part of broader system renewal projects. Outside of planned renewal work, if multiple customers supplied from a common transformer request service upgrade, the associated secondary conductors are evaluated and replaced as required to meet current standards.

Conductor Inspection

RSL patrols its entire distribution system once every three years, in accordance with RSL procedures. Patrols are documented using the Record of Overhead Inspection and are completed by RSL line staff and, where appropriate, qualified contractors. In addition, RSL personnel inspect distribution assets whenever work is performed in an area.

RSL places a strong emphasis on informal inspections. Due to the relatively small size of the system and employees' familiarity with local infrastructure, much of the system is visually inspected during day-to-day activities. Issues identified through these observations are either addressed immediately or prioritized within the work plan based on severity.

Visual Inspection include;

Conductors and Cables

- Low conductor clearance
- Broken/frayed conductors or tie wires
- Exposed broken ground conductors
- Broken strands, bird caging, and excessive or inadequate sag
- Insulation fraying on secondary

Hardware and Attachments

- Loose or missing hardware
- Insulators unattached from pins
- Conductor unattached from insulators
- Insulators flashed over or obviously contaminated (difficult to see)
- Tie wires unraveled
- Ground wire broken or removed
- Ground wire guards removed or broken

General Conditions and Vegetation

- Leaning or broken "danger" trees
- Growth into line of "climbing" plants

- Accessibility compromised
- Vines or bush growth interference (line clearance)
- Bird or animal nests

RSL performs inspections of the underground distribution system every three years. This inspection is mainly visual, in accordance with RSL procedures and includes:

Pad Mounted Transformers and Switching Kiosks:

- Paint condition and corrosion
- Placement on pad or vault
- Check for lock and penta-bolt in place or damage
- Grading changes
- Access changes (Shrubs, trees etc.)
- Phase indicators and unit numbers match operating map (where used)
- Leaking oil
- Lid Damage, missing bolts, cabinet damage
- Cable connections
- Ground connections
- Nomenclature
- Animal nests/damage
- General Condition

Vegetation and Right of Way:

- Accessibility compromised
- Grade changes that could expose cable
- Excessive vegetation on right of way

Conductor Maintenance

As part of ongoing maintenance activities, RSL addresses critical conductor replacements immediately when safety or reliability risks are identified. For other work, conductor condition is assessed holistically alongside poles and transformers, using a project-based risk approach.

Within the conductor asset class, RSL's maintenance focus has included:

- Removal of small conductors
- Conversion of backyard construction to street-side alignments

Overhead System - Tree-Trimming

Vegetation management and right-of-way control are required under the Distribution System Code Minimum Inspection Requirements and represent good utility practice. RSL's service territory includes tourist areas and mature tree cover, requiring careful balancing of community expectations with system safety and reliability.

Tree contact with energized conductors can result in:

- Power interruptions due to faults
- Damage to conductors, hardware, and poles
- Safety hazards to persons and property
- Electric shock risk from energized vegetation

Three-phase circuits, which typically serve higher-priority loads, are trimmed more frequently than single-phase circuits. Vegetation inspections are integrated into other inspection programs, and additional observations are made by field crews during routine work.

RSL conducts line clearing in accordance with its established procedures. Tree trimming removes sufficient foliage to reduce the likelihood of contact during high-wind conditions. All debris is removed, sites are restored to as-found condition, and any asset anomalies identified by tree crews are reported to the Operations Manager for corrective action.

Previously, RSL has used a combination of internal crews and external contractors to complete vegetation management work. Internal crews were used when capital and operational workloads allowed, while contractors were engaged when internal resources were not sufficient to complete the required work program.

Over the forecast period, RSL expects to rely more heavily on local contractors for vegetation management. This reflects the increased level of capital activity in the utility's work program, including system access projects driven by customer connections and development activity. Assigning internal crews primarily to capital work allows RSL to address customer-driven connection needs and system renewal requirements, while maintaining a consistent vegetation management program through contracted resources.

Over the forecast period, RSL has assumed that vegetation management activities will be delivered primarily through contracted resources. This approach reflects the sustained increase in capital activity, including system access projects driven by customer growth and development. Utilizing contractors for vegetation management enables RSL to maintain compliance with inspection and maintenance requirements, while allowing internal crews to remain focused on capital execution. This approach supports system reliability, public safety, and the efficient delivery of both capital and maintenance programs.

Capital

Currently there are not significant priority capital projects based on conductor inspections. Most of the costs in the coming years in maintaining conductors lies in operating costs for vegetation management.

RSL currently maintains several kilometres of #2 ACSR in Prescott, Cardinal, and Morrisburg. Under the proposed five-year capital plan, all #2 ACSR will be replaced with 3/0 ACSR when it is part of the bigger projects.

Transformer, Pole, and Conductor Summary

Based on the asset assessments conducted, the priority for system renewal are in a few major themes.

1) Replacing the remainder Poletrans in 2026
2) Due to conditions, replace all remaining kiosks in Morrisburg and Iroquois in 2026
3) Due to asset conditions, prioritized aged assets in Backyard Construction

3.4.2. Switches

RSL relies upon 75 switches for control of its 8.32kV and 4.16kV systems. They are distributed between the six communities as follows:

Table 38 - Switch Count by Community

Community	4.16kV	8.32kV
Cardinal	14	
Iroquois		9
Morrisburg	21	
Prescott	25	
Westport		4
Williamsburg		2
TOTAL	**60**	**15**

In addition, RSL also operates 10 air-break switches on the 44kV system, which isolate the 10 stations operated by RSL and 8 15kV rated load-break switches on the 4.16kV system, throughout the six areas. All of these are gang-operated.

Maintenance

Gang-operated switches are maintained annually. This involves cleaning the contacts and lubricating the moving parts where required. Additional work is performed wherever the above inspections indicate deficiencies.

Non-gang operated switches are maintained when the above visual inspections indicate a requirement.

Capital

Over the DSP period, RSL plans to install Supervisory Control and Data Acquisition (SCADA) infrastructure and SCADA-capable switches at strategic locations on the distribution system. These investments will:

- Improve system responsiveness during major outage events and severe weather,
- Reduce outage duration through faster sectionalizing and restoration, and
- Enhance operational visibility and situational awareness for system operators.

In addition, RSL has identified a limited number of existing switches that require replacement due to obsolescence and deteriorated condition. These replacements are included in the capital plan to support continued system reliability, safety, and maintainability.

The deployment of SCADA-enabled switches supports improved distribution system reliability by reducing both the duration and customer impact of outages. Remote monitoring and control capabilities allow operators to sectionalize faulted portions of feeders more quickly, restore service to unaffected customers without dispatching field crews, and coordinate restoration activities more effectively during severe weather events. These capabilities are expected to contribute to reductions in outage duration (SAIDI) and customer interruptions (SAIFI) over time, particularly on feeders serving higher customer densities or critical infrastructure.

3.4.3. Metering

RSL manages metering assets under the following categories:

1. Honeywell Elster. Metering infrastructure (AMI communications and head-end components)
2. Honeywell Elster - Residential Meters
3. Honeywell Elster - Commercial Meters
    a. Light Commercial
    b. Commercial/Industrial (CT/PT metering)
4. Wholesale Meters

Advanced Meter Infrastructure

Rideau St. Lawrence Distribution Inc. (RSL) deployed Elster smart meter technology to all residential and commercial customers in 2009. These meters and associated communications infrastructure form the backbone of RSL’s Advanced Metering Infrastructure (AMI) system and continue to support monthly billing, consumption data collection, and operational analytics.

In 2023, RSL proactively replaced a portion of the Elster AMI communications infrastructure by replacing obsolete communication modems. This activity ensured the AMI system remained supported and operationally current.

Residential and Commercial Metering

RSL’s current deployed smart meter inventory is as follows:

- Residential meters: 5,187
- Commercial and industrial meters: 983

RSL bills customers monthly using Elster smart meter technology. The majority of these meters were installed in 2009 and have continued to operate reliably.

Beginning in 2024, Elster upgraded its meter platform from REXU to A4 technology. The upgraded platform provides enhanced functionality, including native bi-directional metering capability. All future meter replacements will utilize the A4 platform to support evolving system and customer requirements, including distributed energy resources.

Inspection/Reverification Schedule

All meters are inspected and re-verified in accordance with Measurement Canada requirements. Planned inspection and re-verification volumes are outlined in Table 36.

Table 36 – Meter Ages

	Residential Meters	Commercial Meters
2026	400	55
2027	4252	128
2028	177	83
2029	55	125
2030	2	78
2031	50	60

RSL’s strategy is to extend meter life by re-verifying meters in batches as they come due and replacing meters as they fail. Smart meter failure rates vary significantly, with environmental exposure. Particularly prolonged sun exposure. Being a key contributing factor.

As re-verification volumes increase due to the age of the deployed meter population, RSL will acquire additional spare meters to support a replacement-as-needed strategy. This also enables proactive replacement of the oldest meter batches as part of ongoing asset management.

To proactively manage both increasing re-verification volumes and expected age-related failure rates, RSL has planned to replace approximately 5,300 meters between 2027 and 2031 from an age priority basis.

Wholesale Meters

All wholesale metering maintenance activities comply with Measurement Canada requirements.

RSL receives power from three Hydro One Transmission Stations: Morrisburg, Brockville, and Crosby. RSL operates ten wholesale metering points. These locations utilize meters with current transformers (CTs) and potential transformers (PTs) housed in primary metering enclosures (PMEs).

Wholesale metering enclosures are inspected by RSL. The meters themselves are serviced by a third-party contractor. Based on manufacturing dates, portions of the wholesale metering population are approaching end-of-life. The existing inventory is summarized in Table 37.

Table 39 - Wholesale Meters and Manufacture Dates

MP ID	Location	Elements	Manufacture Date
1000011350	Brockville TS - Prescott West PME	2	1990
1000006210	Crosby TS Westport PME	3	1981
1000006190	Morrisburg TS Best Foods T1	3	1985
1000006200	Morrisburg TS Cardinal MS1	3	2005
1000011330	Morrisburg TS Morrisburg PME	2	1991
1000015220	Morrisburg TS Williamsburg PME	3	2005
1000015670	Morrisburg TS Caldwell T2	2	2006
1000016020	Morrisburg TS Prescott East PME	2	1991
1000019910	Morrisburg TS Iroquois	3	2007
1000019900	Morrisburg TS Cardinal MS2	3	2008

Wholesale metering assets are primarily replaced based on life-cycle considerations. While RSL has extended the service life of certain equipment beyond typical industry expectations, renewal is now required due to increasing operational risk and declining equipment supportability.

Many oil-based instrument transformers and metering components associated with older PMEs are now obsolete, and replacement parts can no longer be readily procured. Historically, RSL relied on spare-sharing arrangements with other utilities. This approach is no longer sufficient given sector-wide asset attrition and the age profile of similar equipment across Ontario.

RSL will replace all PMEs manufactured prior to 2000. Decommissioned equipment that remains serviceable will be retained as spares where possible. New spare inventories will also be established to support the replacement equipment.

Capital

RSL has prepared a capital budget that supports anticipated customer growth over the next five years. The budget also accounts for expected smart meter failures and the increasing inspection and replacement requirements associated with an aging meter population.

Over the DSP period, RSL plans to replace five of the ten wholesale metering points. The replaced units will be retained as spares where practicable to support the remaining in-service metering points, while also establishing appropriate spares for the new wholesale metering equipment.

3.5. Fleet

3.5.1. Fleet Summary

RSL operates and maintains a fleet of vehicles and specialized equipment to support safe and efficient operation, maintenance, and renewal of its distribution system. The fleet is sized to meet current operational requirements across RSL's six service territories while maintaining the flexibility needed to respond to outages, routine maintenance, and approved capital work.

Fleet assets are classified as General Plant and support system reliability and safety rather than directly forming part of the electrical distribution system. When evaluating timely fleet replacements, RSL evaluates every purchase with compares it to increased contractor usage like other small utilities in eastern Ontario in comparing the cost and response time to evaluate for appropriateness. Additionally, RSL does also compare it against a rental/lease fleet approach in each of its decisions.

Table 40 – Fleet Age and Replacement

Size	Type of Truck	Year of Vehicle	Replacement
Large	Single Bucket	2010	2026
Large	Double Bucket	2011	2026
Large	Digger	2017	2031
Small	¾ Ton Truck	2023	2030
Small	½ Ton Truck	2021	2032
Small	½ Ton Truck	2015	2026
Trailer	Derrick	N/A	2030

RSL's fleet currently consists of three heavy-duty utility trucks and three light-duty service vehicles. Together, these assets support daily operations, emergency response, and capital project execution across RSL's service territory.

As part of its long-term system renewal strategy, RSL is progressively converting legacy rear-lot and backyard distribution designs to roadside configurations where feasible. This approach improves system reliability, enhances public and worker safety, and supports long-term maintainability.

Historically, work associated with rear-lot infrastructure was completed using external contractors or short-term equipment rentals. As the volume of backyard construction renewal activity increases, reliance on these approaches has become less cost-effective and less operationally flexible. Accordingly, the capital plan includes the addition of a dedicated backyard derrick unit to support internal construction capability and reduce reliance on external resources. This investment is intended to improve scheduling certainty, control costs over time, and minimize customer disruption during renewal activities.

Capital

Based on fleet condition and age, the capital plan includes the replacement of two heavy-duty utility trucks and one light-duty service vehicle in 2026. RSL has extended the in-service life of fleet assets through preventive maintenance and condition-based management where it is prudent to do so, with the objective of moderating costs while maintaining acceptable safety and reliability risk.

Over the DSP planning horizon, fleet investment is primarily renewal-driven and focused on sustaining existing operational capability rather than expanding fleet size.

The large digger derrick truck is planned for replacement in 2031, at approximately 14 years of service, based on expected service life, condition, and operational requirements.

The addition of a backyard derrick represents the only new fleet class included in the planning period and reflects a cost-effective alternative to continued reliance on equipment rentals or contracted services for rear-lot renewal work

3.5.2. Fleet Inspection and Maintenance

Inspection

Daily (Driver Pre-Trip / Post-Trip)

- Required under *Ontario Regulation 199/07 – Daily Inspections*.
- Complete Schedule 1 checklist for CMVs (defects in brakes, tires, lights, coupling, safety equipment, etc.).
- Defects must be recorded in inspection reports kept for 6 months (per law).

Quarterly (Fleet Maintenance Staff)

- Preventive maintenance including oil/filter service, hydraulic checks, brake inspections, safety system tests.
- Supports compliance with HTA *s. 84–85* requiring vehicles be "in proper working order at all times."

Annual (Certified Mechanic / External Provider)

- Annual Safety Standards Certificate per *O. Reg. 611 – Safety Inspections*.
- Annual CVOR compliance inspection records retained for 2 years.
- Dielectric Testing of insulated booms and buckets per *CSA C225*.
- Load and stability tests for diggers and aerial devices.
- Emissions test (Drive Clean) for heavy-duty vehicles, as required in southern Ontario.

Maintenance

- Preventive Maintenance (PM): Scheduled based on mileage, engine hours, or fixed intervals (e.g., every 5,000–8,000 km or 3–6 months, depending on vehicle type). Covers engine, drivetrain, hydraulics, and aerial components.
- Corrective Maintenance: Immediate repair of defects found during inspections or reported by operators.
- Predictive Maintenance: Use of telematics, diagnostic codes, and trend data to anticipate failures and schedule repairs before breakdowns occur.

Record Keeping

Required by Ontario law:

- Daily inspection reports retained for 6 months (*O. Reg. 199/07, s.8*).
- Maintenance and repair records retained for at least 2 years (*HTA s.85*).
- Annual safety inspection certificates retained for 2 years (*O. Reg. 611*).
- Dielectric and stability test reports retained per utility policy and CSA standards.

4. PERFORMANCE MEASUREMENT FOR CONTINUOUS IMPROVEMENT

RSL continues to track and assess its performance with the objective of maintaining system reliability, supporting prudent capital investment, and ensuring that customer expectations are met in a sustainable and cost-effective manner. Since its previous submission, RSL has strengthened its monitoring and decision-making framework through the implementation of an asset management systems, and an enhanced asset assessment and prioritization process. These tools provide greater accuracy in tracking project expenditures, identifying end-of-life assets, and aligning resources with areas of highest impact.

The utility's small service territory in the past had not warranted an in-house engineering staff or in house construction staff. However, with the recent developments the work has increased substantially. RSL has increased in house construction time by utilizing its crew to construct developments where appropriate and supplement the staff with contractors where necessary. RSL will look to transition from contracted engineering to developing in house engineering staff. RSL maintains in house crew that maintains the system and constructs the system. At times it will use contractor to support engineering studies, while maintaining finance, customer service, and overall management in-house. This hybrid structure ensures that costs are incurred only when work is performed, allowing RSL to retain cost efficiency while ensuring high-quality execution of physical work. Project work is contracted on a fixed-price basis, while maintenance and repair activities are completed under pre-negotiated unit pricing arrangements. This approach has proven effective in balancing financial control with timely service delivery.

4.1.1. Customer Focus - Customer Engagement Survey Results

RSL relies on customer engagement to get a to get a good sense of what's important to the customers to ensure that the customers priorities are measured in the performance measurements and continuous improvement. Some of the methods of engagement are listed below.

RSL engages with its customers through multiple channels to better understand customer priorities and to inform system planning decisions, while balancing reliability and cost considerations. Customer engagement activities include:

- Customer engagement surveys
- Direct customer visits at customer locations

- Direct customer service interactions, including in-office and telephone communications
- Engagement with municipal councils across all service territories
- Regular engagement with municipal staff
- RSL executives meet with largest commercial and Industrial customers

RSL values its customers and regularly seeks feedback to ensure that their needs are understood and addressed. Engagement methods have included person-to-person communication, bill inserts, and periodic customer surveys. RSL maintains an accessible office where customers can open accounts, relocate services, make payments, or resolve concerns directly with local representatives. These in-person and telephone interactions ensure that customer issues are managed quickly and with attention.

In recent years, RSL has undertaken customer satisfaction surveys to collect input on billing, conservation programs, service levels, and overall satisfaction. Surveys have been streamlined to reduce fatigue and encourage participation. The findings from these surveys help RSL ensure that its operations and priorities remain aligned with the expectations of its customers.

RSL has conducted both individual and group customer engagement surveys in recent years. The most recent survey was completed in 2025 and indicated a high level of overall customer satisfaction. RSL achieved a customer satisfaction score of 85 percent, an increase from 81 percent in the prior survey conducted in 2023. Based on feedback from the survey vendor, RSL's results were tied for second highest among thirteen Ontario utilities using the same survey methodology.

Table 2 - RSL Customer Satisfaction Score

The 2025 customer engagement survey also provided insight into customer priorities. While overall satisfaction remains high, customers identified the following reliability and affordability considerations as their top priorities. These priorities have been consistently identified through customer engagement over multiple years:

- Reducing the duration of power outages (97 percent)
    - Keeping electricity bill costs manageable (96 percent)
    - Reducing the frequency of power outages (93 percent)

Through direct customer engagement, including site visits and meetings at RSL's offices, the following themes were identified:

- Customers express immense support for municipal growth and community development, including new grocery stores, arenas, housing developments, and long-term care facilities.
- Customers are generally satisfied with service quality and reliability, but if they had to pick, this is an area they'd want to prioritize
- Customers support continued replacement of deteriorating and aging infrastructure as it is seen as a means of maintaining the existing reliability
- Customers prefer the use of proven, industry-standard technologies that improve reliability at reasonable cost, there is not a lot of support for significant innovation and risk.
- An increasing number of residential customers work from home and have expressed interest in minimizing service disruptions and construction impacts, including reducing intrusion into backyards where feasible.
- Customers continue to value proactive vegetation management and tree trimming, while also expressing interest in preserving mature trees where safety and clearance requirements permit.
- A small subset of customers has expressed strong interest in understanding net metering and micro-generation arrangements.

RSL previously held open houses in support of prior Cost-of-Service and Distribution System Plan applications; however, attendance at those sessions was limited. For the current DSP and Cost-of-Service application, RSL did not hold an additional open house. Instead, RSL shared its five-year DSP and capital plan with all municipalities within its service territory and sought feedback. Municipal input was generally consistent with customer survey results, emphasizing the importance of supporting growth, replacing aging infrastructure, maintaining reliability, and enabling local economic development.

Overall, RSL monitors customer-oriented performance measures and continues to meet customer performance expectations. RSL tracks system reliability on an ongoing basis. While customers understandably prefer uninterrupted service, no specific or recurring reliability concerns have been identified through customer engagement activities.

Power quality concerns have arisen infrequently over the past five years and have been limited to isolated customer inquiries. Power quality has not been raised as a systemic concern across RSL's service territory.

Large Commercial and Industrial Customers Engagement

RSL executives engage with the large commercial customers within RSL directly on an annual basis. Most of the large industrial customers have shared their plans for load growths and their corporate strategies. Since RSL has very few large customers, this growth is managed on a case-by-case basis.

In Additional to load growth support, one of the large industrials have asked for generational capacity for their business. Due to the significant areas constrained by Hydro One TS Generation Capacity, RSL has worked with the customer to execute non exporting generation capacity to offset new load.

While Load growth and generation capacity is what is most talked about for their individual economic development, the large customers are interested in being educated on Global Adjustment charges. RSL executives spend significant time educating large customers on how the charges are calculated and how they can minimize their peak loads to affect the overall cost

- Larger commercial and industrial customers value engagement related to Global Adjustment charges and understanding how consumption patterns can influence those costs.

RSL will breakdown the important factors based on the priorities for the customers.

Economic Development

RSL has supported strong economic development over the last 5 years. This development has been the most significant in the last the RSL history. Economic development includes institutional loads such as schools, long-term care facilities, and other community-critical services whose reliability has broad social and economic implications."
Below are some highlights of the economic development activities over the last 5 years.
Westport

- New Multiphase Subdivision – Watercolours
  - Supported the builder's priority for DERs by working with H1 to get capacity
- Fibre Joint Use Poles

Prescott

- New Arena
- New Grocery Store
- New Long-Term Care
- New - First Hotel
- Multiple commercial developments
- Large Industrial expansion
- Fibre Joint Use Poles
- EV Charging
- Enabling School service upgrade and DER

Cardinal

- Fibre Joint Use Poles

Iroquois

- New Multi Phase Subdivision – Merkley Oaks
- Large Industrial DER development in capacity constrained area
- Multiple Commercial developments
- Increase capacity for developments
- Enabling School service upgrade

Morrisburg

- Multiple Commercial Developments
- New Large Industrial Connections
- EV Charging
- Fibre Joint Use Poles

Williamsburg

- No significant economic development Activities

As we move forward into the next DSP, system access economic development opportunities will continue to be prioritized. It's a strong mandate from our customers.

Reliability

Reliability is a key priority for RSL's customers, and is a central consideration in RSL's capital and operational planning. RSL monitors system reliability using industry-standard metrics, including the System Average Interruption Duration Index (SAIDI) and the System Average Interruption Frequency Index (SAIFI).

Table 41 - 5 Year Reliability Performance Summary

		2021	2022	2023	2024	2025
Average Customer Count		5914	5955	6120	6169	6200
Number of Interruptions		39	29	28	43	44
Number of Customer Interruptions		2,364	6480	8,823	6,680	10,528
Total Customer Hours of Interruptions		11,528	6,552	27,497	16,030	34,855
SAIDI		1.95	1.10	4.49	2.60	5.62
SAIFI		0.4	1.09	1.44	1.08	1.69
Excluding loss of service from Hydro One	SAIDI	0.28	0.63	1.77	0.41	1.57
	SAIFI	0.10	0.14	0.44	0.11	0.26

The results demonstrate that upstream supply interruptions have a material influence on RSL's reported reliability metrics.

SAIDI

Table 42 – 2021-2025 – Sum of Customer Hours Lost per cause Code

Row Labels	Sum of Customer hrs
2 - Loss of Supply	84735
1 - Scheduled Outage	8807
6 - Adverse Weather	6964
5 - Defective Equipment	6674
9 - Foreign Interference	2557
3 - Tree Contacts	1266
8 - Human Element	200
Grand Total	**111201**

Loss of supply events originating upstream of RSL's system represent the primary contributor to customer hours interrupted over the past five years, exceeding the combined impact of all other outage causes. This reflects RSL's status as a fully embedded distributor supplied by Hydro One Networks Inc.

RSL continues to work with Hydro One to improve outage impact recognition by incorporating downstream customer counts at each supply point, rather than treating RSL as a single wholesale customer. This enhanced visibility is expected to support improved outage prioritization and restoration sequencing.

Additionally, RSL has evaluated options in the region for additional supply points. Only Prescott Ontario has supply points from 2 sources. The recent accelerated regional planning team with the local municipal and regional governments along with Hydro One and IESO has evaluating in more capacity in scope. RSL will work with the entities to advocate for more capacity and additional supply points.

Also, RSL evaluated the potential use of Battery Energy Storage Systems (BESS) as an alternative measure to mitigate customer impacts from upstream loss-of-supply events. BESS can, in certain system configurations, provide short-duration support to maintain service during brief upstream interruptions or support limited islanding of critical loads.

As a fully embedded distributor with geographically separated and electrically independent systems, RSL determined that BESS would not represent a cost-effective or proportionate solution for addressing loss-of-supply events at this time. Meaningful reliability benefits would require storage systems sized to support entire communities or critical feeder segments for extended durations, resulting in capital costs that materially exceed the expected reliability benefits.

In addition to capital costs, utility-scale BESS deployment would require new operational capabilities, including real-time dispatch, protection coordination, cyber-security controls, and ongoing monitoring and maintenance. Establishing and maintaining these capabilities would materially increase operating costs relative to the limited reliability improvement achievable under RSL's current system configuration.

Based on this assessment, RSL determined that targeted system hardening, increased automation, improved switching capability, additional supply capacity, and enhanced coordination with its upstream supply provider represent more prudent and cost-effective measures to improve reliability outcomes for customers over the DSP planning horizon.
RSL will continue to monitor the evolution of storage technologies, regulatory frameworks, and funding opportunities, and will reassess the role of BESS in future planning cycles as costs decline and operational models mature.

RSL has put significant focus on the remainder causes of customer impact. Within RSL's direct control, several initiatives are underway or planned to reduce customer interruption duration:

Scheduled Outages:

Capital investments such as the second station in Iroquois will eliminate the need to interrupt the entire community for station maintenance. Interties and transformer upgrades, including fan-assisted capacity at Cardinal MS1, increase back feed capability and reduce outage duration.

Adverse Weather and Tree Contacts:
Deployment of SCADA-capable switches and reclosers improves fault isolation and restoration times. Enhanced vegetation management targeting higher-risk areas further reduces outage exposure.

Defective Equipment:
Targeted asset replacement, including conversion of rear-lot infrastructure to roadside configurations, reduces failure risk and improves maintainability.

SAIFI

The major causes of Customer interruption are listed below in Table 40.

Table 43 – 2021-2025 – Count of Customer Interruption per cause code

Row Labels	Sum of No of Customers Affected
2 - Loss of Supply	27135
1 - Scheduled Outage	2022
6 - Adverse Weather	1540
5 - Defective Equipment	1020
9 - Foreign Interference	648
3 - Tree Contacts	387
8 - Human Element	50
Grand Total	32802

Loss of supply is also the dominant contributor to interruption frequency. While the manners to address this for SAIFI is the same as for SAIDI, it won't be rehashed in this section again. RSL once again puts significant effort in working on outages within its control.

Scheduled outages represent the second-largest contributor, reflecting RSL's largely radial system configuration and limited historical back feed capability.

RSL addresses interruption frequency by prioritizing system service investments where they can be efficiently coordinated with system access or renewal projects, recognizing that extensive back feed infrastructure is capital-intensive and must be paced prudently.

Additional initiatives addressing interruption frequency include:

- Expanded use of reclosers in place of fuses.
- Enhanced vegetation management prioritization.
- Improved fault isolation through automation.

Verification against New OEB Performance Targets for SAIDI for SAIFI

The Ontario Energy Board has established distributor-specific reliability performance targets based on historical results. For RSL, these targets include maintaining SAIDI performance and achieving incremental improvement in SAIFI.
RSL calculated historical performance for the 2020–2024 period in accordance with OEB guidance.

Table 44 – 2020-2024 – OEB Performance Baseline

		2020	2021	2022	2023	2024
Average Customer Count		5912	**5914**	**5955**	**6120**	**6169**
Number of Interruptions		**18**	**39**	**29**	**28**	**43**
Number of Customer Interruptions		8,146	2,364	6480	8,823	6,680
Total Customer Hours of Interruptions		12,394	11,528	6,552	27,497	16,030
SAIDI		2.10	1.95	1.10	4.49	2.60
SAIFI		1.38	0.4	1.09	1.44	1.08
Excluding loss of service from Hydro One	**Interruptions**	13	37	26	21	38
	Customer Interr	380	564	849	2,670	648
	Customer Hrs	700	1,684	3,736	10,857	2,517
	SAIDI	0.12	0.28	0.63	1.77	0.41
	SAIFI	0.08	0.10	0.14	0.44	0.11

Table 45 - OEB Performance Targets

	2020-2024	Calculation	2027 Target
SAIDI	2.46	$2.46 \times (1-0.01)^2$	2.41
SAIFI	1.08	$1.08 \times (1-0.00)^2$	1.08
Ex H1 SAIDI	0.65	$0.65 \times (1-0.01)^2$	0.64
Ex H1 SAIFI	0.17	$0.17 \times (1-0.00)^2$	0.17

RSL reviewed its DSP capital plan and operating programs for 2026 and 2027 against these targets and confirmed that the planned investments and activities are expected to maintain or improve reliability performance consistent with OEB requirements.

Capital initiatives supporting reliability performance include:

- Iroquois second station (risk mitigation and redundancy).
- Fleet replacement to maintain internal response capability.
- Kiosk and pole-mounted transformer replacements.
- Replacement of high-priority air-break switches.
- NRCan-supported automation and switching projects.
- Progressive conversion of rear-lot infrastructure to roadside designs.

Operational initiatives supporting reliability performance include:

- Increased vegetation management spending.
- Enhanced on-call response capability.
- Deployment of automated reclosers.
- Continued coordination with Hydro One regarding upstream outage prioritization

- Increasing operations skills

RSL's operational planning recognizes that certified and experienced Power Line Technicians are a critical reliability input. Recent sector-wide labour market pressures and historical compensation constraints resulted in the loss of experienced staff, increasing restoration times and reliance on contractors. The OM&A adjustments proposed in the COS application are intended to stabilize workforce capability, reduce long-term contractor costs, and support reliable execution of the DSP.

Summary

Over the five-year review period, RSL has experienced an increase in reported outages, driven predominantly by upstream supply interruptions outside of RSL's direct control. As a fully embedded distributor, these upstream events have a material impact on RSL's overall SAIDI and SAIFI results. In response, RSL has focused its operational and capital resources on areas whin its control where it can deliver the greatest benefit to customers. This includes prioritizing the mitigation of outages originating within its own distribution system through targeted investments, maintenance programs, and operational improvements.

RSL has taken and continues to plan targeted actions to mitigate outage duration and frequency for customers. These actions focus on reducing the customer impact of both planned and unplanned interruptions through prudent capital investments and operational improvements. RSL has also enhanced coordination with its upstream supply partner to improve outage prioritization and restoration sequencing based on downstream customer impacts.

RSL's five-year DSP includes a combination of capital initiatives and operational measures intended to maintain and improve reliability performance consistent with the Ontario Energy Board's reliability performance targets. Capital investments are focused on increasing system flexibility, reducing restoration times, and addressing higher-risk assets, while operational initiatives emphasize vegetation management, response capability, and system automation. Together, these actions are expected to mitigate the reliability impacts within RSL's control and support continued progress toward maintaining SAIFI performance and improving SAIDI outcomes for customers over the planning horizon.
Cost

While the Distribution System Cost metrics presented in this DSP are capital-focused, RSL considers both capital and operating cost impacts when evaluating investment alternatives. Capital projects are assessed using a total cost-of-ownership perspective, including impacts on inspection effort, maintenance requirements, outage response, and reliance on contracted services.

Where capital investments are expected to increase ongoing operating costs, those impacts are reflected in RSL's OM&A forecasts in the Cost-of-Service application. Conversely, several capital initiatives included in the DSP are intended to improve maintainability, reduce emergency response requirements, and limit long-term reliance on contractors, thereby moderating future operating cost pressures.

Although overall operating costs are influenced by broader external and operational factors, the integration of capital and operating cost considerations supports prudent investment decisions and helps moderate customer bill impacts over time.

Table 46 - Cost Metrics

CAPEX	2022–2026 Planned	2022–2026 Actual	2027–2031 Planned
System Access	$640,000	$3,313,328	$1,096,676
System Renewal	$2,868,012	$1,696,293	$4,918,530
System Service	$293,000	$2,196,449	$2,678,637
General Plant	$926,000	$1,643,029	$1,713,000
Total CAPEX	$4,727,012	$8,849,099	$10,406,843
Total CAPEX / Customer	$748	$1,401	$1,647
Total CAPEX / km of Line	$42,973	$80,446	$94,608

Service Quality and Reliability

Ch 2-App 2-G at the next page provides five years of historical service quality and reliability results, including SAIDI and SAIFI. Performance excluding loss of supply and major event days has been generally stable, with some year-to-year variability. The increase in 2025 reflects a small number of weather-related and localized outage events, rather than a sustained trend. Results including loss of supply and major event days are higher due to factors outside the distributor’s control.

The DSP addresses these trends through targeted investments in vegetation management, asset renewal, and condition-based maintenance to support reliability over the planning period.

No formal SAIDI/SAIFI targets were established in the previous DSP, therefore no under-performance arises.

RSL confirms that Ch 2-App 2-G is consistent with reported performance data and the OEB scorecard, with no material inconsistencies.

Table 47 – App 2-G Reliability

Index	Definition	2021	2022	2023	2024	2025
SAIDI	Excl. Loss of Supply & Major Event Days	0.28	0.63	1.77	0.41	1.57
SAIDI	Incl. Major Event Days, Excl. Loss of Supply	0.28	0.63	1.77	0.41	1.57
SAIDI	Incl. Loss of Supply, Excl. Major Event Days	1.95	1.10	4.49	2.60	5.61
SAIDI	Incl. Loss of Supply & Major Event Days	1.95	1.10	4.49	2.60	5.61
SAIFI	Excl. Loss of Supply & Major Event Days	0.10	0.14	0.44	0.11	0.26
SAIFI	Incl. Major Event Days, Excl. Loss of Supply	0.10	0.14	0.44	0.11	0.26
SAIFI	Incl. Loss of Supply, Excl. Major Event Days	0.40	1.09	1.44	1.08	1.69
SAIFI	Incl. Loss of Supply & Major Event Days	0.40	1.09	1.44	1.08	1.69

Table 48 – App 2-G Reliability 5-year Average

Metric	Definition	Value
SAIDI	Excl. Loss of Supply & Major Event Days	0.933
SAIDI	Incl. Major Event Days, Excl. Loss of Supply	0.933
SAIDI	Incl. Loss of Supply, Excl. Major Event Days	3.150
SAIDI	Incl. Loss of Supply & Major Event Days	3.150
SAIFI	Excl. Loss of Supply & Major Event Days	0.208
SAIFI	Incl. Major Event Days, Excl. Loss of Supply	0.208
SAIFI	Incl. Loss of Supply, Excl. Major Event Days	1.140
SAIFI	Incl. Loss of Supply & Major Event Days	1.140

Table 49 – App 2-G Service Quality

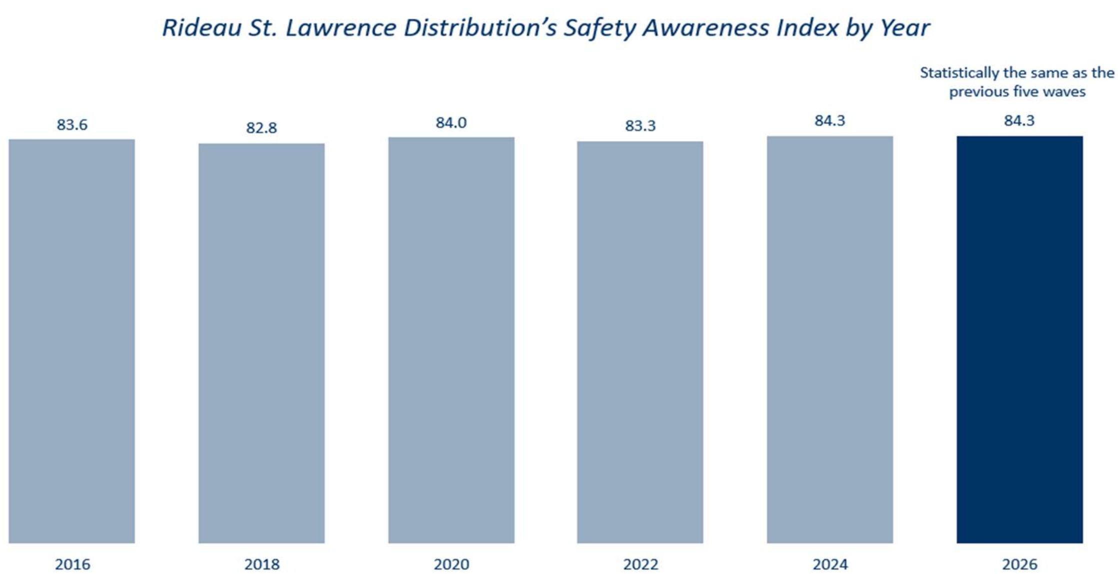
Indicator	OEB Minimum Standard	2021	2022	2023	2024	2025
Low Voltage Connections	90.0%	100.00%	100.00%	100.00%	100.00%	100.00%
High Voltage Connections	90.0%	—	—	—	—	—
Telephone Accessibility	65.0%	76.20%	75.84%	76.29%	88.47%	98.45%
Appointments Met	90.0%	100.00%	100.00%	100.00%	100.00%	100.00%
Written Response to Enquiries	80.0%	97.88%	98.90%	100.00%	100.00%	100.00%
Emergency Urban Response	80.0%	100.00%	100.00%	100.00%	100.00%	100.00%
Emergency Rural Response	80.0%	—	—	—	—	—
Telephone Call Abandon Rate	10.0%	0.61%	0.72%	2.75%	2.23%	8.36%
Appointment Scheduling	90.0%	100.00%	100.00%	100.00%	100.00%	100.00%
Rescheduling a Missed Appointment	100.0%	—	—	—	—	—
Reconnection Performance Standard	85.0%	100.00%	100.00%	100.00%	100.00%	100.00%

4.1.2. Safety - ESA Customer Awareness Survey Results

In 2026, RSL collaborated with 12 peer utilities to jointly procure Electrical Safety Authority (ESA) public awareness survey services through a third-party provider, Advanis.

The survey results indicate that RSL's public safety awareness score increased modestly from 83.3% in 2022 to 84.3% in both 2024 and 2026. While the change is incremental, the results demonstrate that safety awareness levels within RSL's service territory have been maintained and remain consistent over the period.

RSL continues to focus on both the public and developers to reduce risk of
RSL uses these results as one input, alongside incident data and operational experience, to assess the effectiveness of its public safety initiatives and to inform ongoing communication and education efforts.



4.1.3. ESA Compliance

Each year, RSL is subject to an audit by the ESA to determine compliance. The audits have found that RSL complies.

4.1.4. Major Events

Based upon the historic Major Events experienced by RSL as noted above, the utility has no reliability issues or concerns. And RSL has received no complaints about reliability. Therefore, RSL is proposing no capital investment is required in its assets of distribution system to improve reliability in the context of Major Events. RSL has planned its capital investments to maintain current reliability performance.

5. COORDINATED PLANNING WITH THIRD PARTIES

This DSP has been prepared through a coordinated planning process with the following stakeholders:

a) Customer Engagement
b) Regionally interconnected Transmitters and Distributors – Hydro One.
c) Regional and municipal governments.
d) Telecommunication Entities.

5.1.1. Customer Focus - Customer Engagement Survey Results

This DSP has been prepared through a coordinated planning process with the following stakeholders:

1) Regionally interconnected Transmitters and Distributors – Hydro One.
2) Municipal governments
    a. Village of Westport
    b. Town of Prescott
    c. Township of Edwardsburgh Cardinal
    d. Municipality of South Dundas
3) Regional Municipal Governments
    a. United Counties of Leeds and Grenville
    b. United Counties of Stormont, Dundas, and Glengarry
4) Telecommunication Entities.
    a. Bell
    b. Xplore
5) Developers
6) Ministry of Transportation Ontario
    a. Development of 401.

5.1.2. IESO & Regional Planning

RSL participates in regional planning activities coordinated by the Independent Electricity System Operator and Hydro One Networks Inc. The St. Lawrence regional planning process is undertaken on a five-year cycle. The first cycle concluded with a Regional Infrastructure Plan ("RIP") in July 2016, and the second cycle concluded with a RIP in March 2022. The March 2022 RIP is included in Appendix C.

In the prior regional planning cycle, only one infrastructure investment was recommended by the Technical Working Group and it related to refurbishment of transmission infrastructure. The process did not require detailed IESO-led solution development for the RSL service territory.

Since the completion of the March 2022 RIP, growth in the St. Lawrence region has exceeded prior expectations. This has resulted in increased demand, emerging capacity considerations, and a need to reassess regional system conditions earlier than originally anticipated. In response to these changing conditions, and following municipal input, the Province advanced the third cycle of the St. Lawrence regional planning process.

At the time of filing this DSP, RSL is participating in the third regional planning cycle. The Needs Assessment was completed in March 2026, and the Scoping Assessment is expected to be completed by October 2026. While no regional solutions have been identified or confirmed at this time, the current cycle is expected to reassess updated system conditions, growth forecasts, and emerging demand drivers across the region.

The principal difference between RSL's current DSP and the March 2022 RIP is the level of forecast growth and related system need. The 2022 RIP was developed based on the information and growth expectations available at that time. Since then, regional growth has accelerated, resulting in higher expected demand and increased pressure on upstream infrastructure. RSL will continue to participate in IESO and Hydro One led regional planning processes to ensure that local distribution system conditions, planned investments, customer connection activity, and distributor-level constraints are appropriately reflected in broader regional planning.

5.1.3. Hydro One

RSL is an embedded distributor within the transmission and distribution system operated by Hydro One Networks Inc.. RSL receives bulk supply from Hydro One at the 44 kV voltage level and distributes electricity within its service territory at primary distribution voltages of 2.4 kV and 4.8 kV. In addition, Hydro One supplies certain portions of RSL's service territory through 4.8 kV distribution feeders originating from Hydro One distribution stations, as well as through 44 kV feeders. RSL does not host other embedded utilities within its service area.

Through recent capacity mapping initiative mandated by the OEB certain load and generation constraints have been identified within the broader supply area. While RSL has not been declined any customer load connections to date, the availability of capacity for large incremental loads is constrained in some locations. On the generation side, portions of RSL's service territory are subject to generation capacity limitations, primarily due to thermal constraints at the Morrisburg Transmission Station. In addition, generation capacity in the Westport area is constrained based on generation-to-load screening criteria applied by Hydro One. In response to increasing customer interest in distributed generation, RSL is undertaking connection impact assessments in coordination with Hydro One to better understand available capacity and appropriate mitigation measures.

Operational coordination between RSL and Hydro One occurs on an ongoing basis as required. Hydro One provides advance notice of planned outages, switching activities, and other system updates through established operational channels. This coordination supports the safe and reliable operation of both systems and minimizes customer disruption where possible.

RSL has historically experienced a material portion of its system-wide reliability impacts, as measured by SAIDI and SAIFI, as a result of upstream supply interruptions originating on Hydro One's system. In the past, outage prioritization was managed by Hydro One primarily at the point-of-supply level. In late 2025, Hydro One initiated enhanced engagement with RSL to better understand the number of end-use customers affected at each supply point. This information is expected to improve outage prioritization and restoration sequencing. RSL continues to work collaboratively with Hydro One to mitigate the frequency and duration of supply-related interruptions.

RSL's distribution system is included in the St. Lawrence Region regional planning process led by Hydro One and the Independent Electricity System Operator. RSL has participated in the regional Technical Working Group. The most recent St. Lawrence Regional Infrastructure Plan, completed in 2022, identified no material regional transmission or distribution needs requiring coordinated capital investment. Due to recent changes in growth and demand, a subsequent regional planning cycle was initiated in 2025, and RSL continues to actively participate as updated demand and supply conditions are assessed.

5.1.4. Municipal Government

RSL maintains ongoing working relationships with the municipalities within its service territory, including Morrisburg, Prescott, Cardinal, and Westport. RSL engages in regular monthly discussions with municipal staff to support coordination and information sharing related to local planning activities.

These discussions include coordination on road reconstruction and relocations, planned municipal infrastructure projects, development activity, and construction scheduling, with the objective of minimizing service disruption and ensuring alignment between municipal works and utility infrastructure. This coordination supports efficient project delivery and the prudent use of utility resources.

In recent years, RSL's service territory has experienced increasing development activity. This includes residential growth in the form of new subdivisions and multi-unit residential developments, as well as commercial and industrial activity, including new business connections and expansions of existing customer load requirements. In addition, RSL has observed increasing interest in electric vehicle charging infrastructure across its service area. These trends are reflected in RSL's ongoing load monitoring and are considered in its system planning and forecasting activities.

5.1.5. Telecommunication Entities

Telecommunication entities, including Bell Canada and Xplore Inc., operate within RSL's service territory and make use of RSL-owned distribution infrastructure in accordance with applicable agreements and standards.

Over the past five years, broadband deployment activity has increased in portions of RSL's service area, including Morrisburg, Prescott, and Cardinal. Beginning in 2026, additional broadband expansion activity is anticipated in Westport. This activity has resulted in an increased volume of system access requests and coordination activities.

Where telecommunication attachments require modifications to RSL infrastructure, such work is addressed in accordance with RSL's joint-use, make-ready, and system access requirements. Based on initial communications with proponents, RSL anticipates that make-ready work for incremental upgrades (e.g., to accommodate taller poles or additional loading) may be required, along with associated guying or related system adjustments where necessary to maintain safety and reliability.

Any infrastructure modifications required to accommodate third-party attachments are scoped and implemented in accordance with RSL standards, with costs addressed consistent with applicable tariffs, agreements, and regulatory requirements. To the extent that such work qualifies for cost recovery through established mechanisms, including contributions from attaching parties, those mechanisms will be applied.

No incremental distribution capital investment has been included in this DSP solely as a result of telecommunication attachment activity. Should material incremental costs arise that are not otherwise recovered through existing mechanisms, RSL will assess the appropriate regulatory treatment, including potential use of a deferral account, for future disposition.

5.1.6. Integrated Regional Resource Planning

RSL's distribution system is embedded within and electrically supplied by Hydro One Networks Inc. and forms part of the St. Lawrence regional planning area. As an embedded distributor, RSL participates in the regional planning process led by the Independent Electricity System Operator for the St. Lawrence Region and engages in Technical Working Group activities coordinated with Hydro One and the IESO.
The St. Lawrence Regional Infrastructure Plan, published in March 2022, concluded that no material regional transmission or distribution needs requiring coordinated investment were identified within the planning horizon. Any identified issues were determined to be local in nature and capable of being addressed directly by Hydro One, as transmitter, or by the embedded local distribution companies. Accordingly, no

specific capital investments arising directly from regional planning outcomes were included in RSL's previous or current Distribution System Plans.

More recently, regional planning for the St. Lawrence Region has entered a subsequent cycle, including a Needs Assessment led by Hydro One that was initiated in late 2025 and is expected to be completed in 2026. This work reflects updated regional conditions and follows the 2022 RIP planning cycle. RSL continues to participate in this process alongside Hydro One, the IESO, and other local distribution companies.

RSL notes that regional planning is an iterative process and that system conditions, including load growth, electrification trends, and customer connection activity, continue to evolve. RSL remains actively engaged in ongoing regional planning initiatives and Technical Working Group discussions to monitor emerging regional needs and to ensure that local reliability and capacity considerations are addressed on a coordinated and cost-effective basis. At the time of this DSP filing, no regional planning outcomes have been finalized that would give rise to coordinated regional capital investments requiring inclusion in this DSP.

Separately from the regional planning process, RSL has experienced incremental load growth in 2025 associated with increased development activity within its service territory. In addition, customer interest in distributed energy resources continues to increase. RSL is monitoring these developments in coordination with Hydro One. RSL notes that the Morrisburg Transmission Station, which supplies multiple portions of RSL's service territory, is currently thermally constrained under certain operating conditions. While this matter falls outside the scope of the regional planning process, RSL is engaging with Hydro One to ensure that both local load growth and emerging DER considerations are appropriately understood and addressed.

5.1.7. Ministry of Transport

expansion of Highway 401. The proposed widening to six lanes will result in changes to certain on-ramp and off-ramp configurations within RSL's service territory.

At this stage, the MTO projects remain beyond the five-year planning horizon of this Distribution System Plan. However, preliminary designs have already identified areas where existing electrical infrastructure and land interests may be impacted or require relocation as part of the future highway expansion.

Although these projects are outside the current planning window, RSL has incorporated this information into its planning approach for new connections and system expansions. Where feasible, new infrastructure is being designed and sited to minimize the risk of near-term conflicts with the anticipated Highway 401 expansion and associated roadway modifications.

6. CAPITAL EXPENDITURE PLAN

This section outlines RSL's capital expenditure plan across the historical period, bridge year, test year, and forecast planning horizon.

Table 10 summarizes total capital expenditures by program, including System Access, System Renewal, System Service, and General Plant.

Detailed project-level continuity tables are provided immediately following, presenting capital expenditures by project and by year. These tables reconcile directly to the summary presented in Table 10 and to the capital expenditure schedules included in Table 2-AA.

Table 50 – Summary of Projects (App 2-AB)

CATEGORY	2022 Plan	2022 Actual	Var %	2023 Plan	2023 Actual	Var %	2024 Plan	2024 Actual	Var %	2025 Plan	2025 Actual	Var %
Access	128	368	187%	128	387	202%	128	214	67%	128	925	623%
Renewal	835	552	-34%	758	239	-68%	593	525	-11%	537	444	-17%
Service	-	334	-	49	969	1,877%	-	138	-	94	124	32%
Gen Plant	94	62	-34%	139	210	51%	89	27	-70%	164	53	-67%
Total	1,057	1,316	25%	1,074	1,804	68%	810	903	12%	923	1,546	68%
Contrib.	-	512	-	-	163	-	-	181	-	-	418	-
Net CapEx	1,057	805	-24%	1,074	1,641	53%	810	723	-11%	923	1,128	22%
CWIP	-	-	-	-	-	-	-	249	-	-	1,392	-
System O&M	782	782	0%	820	820	0%	996	996	0%	-	1,357	-

Table 51 – Summary of Projects (App 2-AB) Cont'd

CATEGORY	2026 Plan	2026 Actual	Var %	2027	2028	2029	2030	2031
Access	128	2,347	1,734%	307	1,052	816	696	696
Renewal	145	677	367%	638	1,006	1,264	946	1,263
Service	150	770	413%	1,079	-	-	-	-
Gen Plant	440	1,291	193%	65	-	-	-	-
Total	863	5,085	489%	2,089	2,058	2,081	1,642	1,959
Contrib.	-	552	-	480	-379	-379	-379	-379
Net CapEx	863	4,533	425%	1,609	2,437	2,460	2,021	2,338
CWIP	-	-	-	1,346	-	-	-	-
System O&M	-	1,273	-	1,346	-	-	-	-

Table 52 – Summary of Projects (App 2-AA)

Program	2022	2023	2024	2025	2026 Bridge	2027 Test	2028	2029	2030	2031
System Access (Net)	185,846	386,611	33,763	506,881	1,795,458	(172,970)	1,430,583	1,195,493	1,075,000	1,075,000
System Renewal (Net)	221,965	75,497	524,863	443,588	677,000	637,670	1,006,470	1,264,316	946,322	1,262,597
System Service (Net)	334,397	968,787	137,627	123,800	770,000	1,079,229	0	0	0	0
General Plant (Net)	62,452	210,064	26,576	53,309	1,290,628	65,000	0	0	0	0
Total Capital	804,660	1,640,959	722,830	1,127,577	4,533,086	1,608,929	2,437,053	2,459,809	2,021,322	2,337,597

Table 53 – Gross Fixed Asset Additions – System Access (App 2-AA)

Project Name	2022	2023	2024	2025	2026 Bridge	2027 Test	2028	2029	2030	2031
Replacement Transformers	0	0	0	250,210	0	0	0	0	0	0
Misc - 2400	0	0	0	21,875	0	0	0	0	0	0
Tesla Morrisburg - 2401	0	0	22,713	100,663	0	0	0	0	0	0
Morrisburg Housing - 2403	0	0	11,040	93,561	0	0	0	0	0	0
Iroquois Transformer Housing - 2404	0	0	0	70,734	0	0	0	0	0	0
Safavieh Warehouse - 2410	0	0	0	112,291	0	0	0	0	0	0
James Street - 2416	0	0	2,890	3,095	0	0	0	0	0	0
Misc - 2500	0	0	0	114,767	0	0	0	0	0	0
Anytime Fitness - 2502	0	0	0	6,359	0	0	0	0	0	0
Westport - 2504	0	0	0	16,249	0	0	0	0	0	0
High School Seaway - 2507	0	0	0	119,189	0	0	0	0	0	0

Meter Replacement Plan 2026	0	0	0	0	0	0	0	0	0	0
Iroquois Station MS2 – Capacity (Valecraft, Seaway, Stefanos)	0	0	0	0	950,000	0	0	0	0	0
Iroquois – Valecraft Phase 1 Homes	0	0	0	0	505,989	0	0	0	0	0
Iroquois – Valecraft Phase 2 Homes	0	0	0	0	0	120,493	240,986	120,493	0	0
Valecraft Apartments	0	0	0	0	264,635	58,012	114,597	0	0	0
Watercolours Phase 3	0	0	0	0	231,304	0	0	0	0	0
Prescott Town – Habitat for Humanity	0	0	0	0	3,874	0	0	0	0	0
Prescott Grocery Store – Rosbay	0	0	0	0	91,656	0	0	0	0	0
Dundas Street Resurfacing	0	0	0	0	0	128,525	0	0	0	0
Prescott Madison Apartments – 2 Claxton	0	0	0	0	0	0	0	0	0	0
Prescott Edward 44kV for PLTC	0	0	0	0	300,000	0	0	0	0	0
Meter Replacement Plan 2027	0	0	0	0	0	0	0	0	0	0
Iroquois – Valecraft Phase 2 Homes (duplicate)	0	0	0	0	0	0	0	0	0	0
Misc - 2201	108,138	0	0	0	0	0	0	0	0	0
Misc - 2301	0	54,893	19,603	0	0	0	0	0	0	0
Westport Landark Construction	8,646	0	0	0	0	0	0	0	0	0
Ross Video	19,958	1,554	1,667	0	0	0	0	0	0	0
Prescott Arena	124,703	35,912	0	0	0	0	0	0	0	0
Westport Phase II Subdivision	35,242	160,897	525	0	0	0	0	0	0	0
Miscellaneous	2,346	0	0	0	0	0	696,000	696,000	696,000	696,000
Wellington School	20,894	0	0	0	0	0	0	0	0	0
MacEwens Edward Street	22,486	44,026	65,655	0	0	0	0	0	0	0
Miscellaneous	2,712	0	0	0	0	0	0	0	0	0
Dollarama Prescott	20,935	0	0	0	0	0	0	0	0	0
Miscellaneous	1,665	0	0	0	0	0	0	0	0	0
Miscellaneous	0	65	0	0	0	0	0	0	0	0
Wellington School	0	8,538	0	0	0	0	0	0	0	0
Dollarama Prescott	0	45,544	0	0	0	0	0	0	0	0
McDonald's Line Extension	0	10,817	0	0	0	0	0	0	0	0
Caldwell Drive Iroquois	0	4,019	0	0	0	0	0	0	0	0
Prescott Arena Fiber Line	0	14,900	0	0	0	0	0	0	0	0
T Coville	0	0	0	16,386	0	0	0	0	0	0
Quality Inn Hotel Prescott	0	5,446	67,629	0	0	0	0	0	0	0

Harland Veinotte	0	0	4,285	0	0	0	0	0	0	0
110 King Street - 2412	0	0	4,856	0	0	0	0	0	0	0
Madison Mulder Churchill - 2406	0	0	13,519	0	0	0	0	0	0	0

Project Name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
System Access Gross Expenditures	367,726	386,611	214,383	925,378	2,347,458	307,030	1,051,583	816,493	696,000	696,000
System Access Capital Contributions	181,880	0	180,620	418,498	552,000	480,000	-379,000	-379,000	-379,000	-379,000
System Access Net Sub-Total	185,846	386,611	33,763	506,881	1,795,458	(172,970)	1,430,583	1,195,493	1,075,000	1,075,000

Table 54 – Gross Fixed Asset Additions – System Renewal (App 2-AA)

Project Name	2022	2023	2024	2025	2026 Bridge	2027 Test	2028	2029	2030	2031
Fort Town Drive Pole Trans 3 - Safety	0	0	0	0	105,000	0	0	0	0	0
Kingston Cre Pole Trans - Safety	0	0	0	0	180,000	0	0	0	0	0
Morrisburg Plaza Kiosk Replacements	0	0	0	0	260,000	0	0	0	0	0
Iroquois Plaza Kiosk Replacements	0	0	0	0	0	259,898	0	0	0	0
Replace Air Break Switch with S&C Load Break	0	0	0	0	100,000	0	0	0	0	0
Station Resurfacing - Cardinal - MS1	0	0	0	0	0	20,000	0	0	0	0
Station Resurfacing - Iroquois - MS1	0	0	0	0	0	20,000	0	0	0	0
Station Resurfacing - Morrisburg - MS1 and MS2 Repair	0	0	0	0	0	2,500	0	0	0	0
Station Resurfacing - Prescott MS2, MS3, MS4	0	0	0	0	0	12,500	0	0	0	0
2221	0	0	0	3,551	0	0	0	0	0	0
2313	0	0	0	1,574	0	0	0	0	0	0
Church Street Iroquois - 2404	0	0	0	65,100	0	0	0	0	0	0
PCB - 2413	0	0	150	197,153	0	0	0	0	0	0
Northern Cables - 2419	0	0	0	2,106	0	0	0	0	0	0
PCB - 2501	0	0	0	135,529	0	0	0	0	0	0
Pole Hit - 2503	0	0	0	7,521	0	0	0	0	0	0
Pole Hit - 2505	0	0	0	1,365	0	0	0	0	0	0
Storms - 2506	0	0	0	9,002	0	0	0	0	0	0
Fire - 2508	0	0	0	9,171	0	0	0	0	0	0
Pole Replacements - 2510	0	0	0	11,516	0	0	0	0	0	0
Prescott Live Front - Kingston Cres - Safety	0	0	0	0	0	0	0	0	0	0
Misc. System Renewal Projects	0	0	0	0	0	0	0	0	0	0
MacKenzie Rd Prescott	0	0	11,203	0	0	0	0	0	0	0
PCB Transformers - 2315	0	0	17,327	0	0	0	0	0	0	0
Miscellaneous - 2400	0	0	206,530	0	0	0	0	0	0	0
Pole Replacements - Sir James - 2407	0	0	4,919	0	0	0	0	0	0	0
Church St Iroquois	0	0	127,850	0	0	0	0	0	0	0
Reid Street Cardinal	0	0	80,770	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - South Square	0	1,163	0	0	0	0	0	0	0	0
Pole Replacements - Fifth Street St. Lawrence	0	13,655	0	0	0	0	0	0	0	0

Fibre to the Home (FTTH) - High Street Small Conductor	0	1,343	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - Morrisburg	0	107,511	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - Morrisburg 2	0	10,239	1,765	0	0	0	0	0	0	0
2023 Storms	0	3,316	0	0	0	0	0	0	0	0
Fibre to the Home - Lions Bell	0	28,941	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - Cardinal - 2313	0	855	6,956	0	0	0	0	0	0	0
Meter Replacements - 1860	55,012	42,875	67,393	0	32,000	274,700	0	0	0	0
1014A Work - 2022	36,362	0	0	0	0	0	0	0	0	0
Misc 2021 Jobs - 2101	0	0	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - McKenzie Road	48,744	22,291	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH) - F	0	0	0	0	0	0	0	0	0	0
Transformer Replacements	2,284	0	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH)	201,499	0	0	0	0	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0	0	0	0	0
Fibre to the Home (FTTH)	17,950	0	0	0	0	0	0	0	0	0
Pole Replacements	12,264	0	0	0	0	48,072	0	0	0	0
Dundas Street Rebuild – Bridge to Benson	0	0	0	0	0	0	157,873	0	0	0
Fifth Street Rear Lot Conversion	0	0	0	0	0	0	190,392	0	0	0
Caldwell Drive Rear Lot Conversion	0	0	0	0	0	0	0	124,215	0	0
Maple Street Rear Lot Conversion	0	0	0	0	0	0	0	208,532	0	0
Orchard Way Rear Lot Conversion	0	0	0	0	0	0	0	268,664	0	0
Benson Street – Rear Lot Conversion	0	0	0	0	0	0	0	0	59,494	0
Joseph Street – Small Conductor	0	0	0	0	0	0	0	0	106,748	0
Perry Street – Small Conductor	0	0	0	0	0	0	0	0	66,175	0
Alexander The Square – Rear Lot Conversion	0	0	0	0	0	0	0	0	0	116,075
Churchill E Extension – Rear Lot Conversion	0	0	0	0	0	0	0	0	0	159,252
Roberta Cres – Rear Lot Conversion	0	0	0	0	0	0	0	0	0	313,570
Commercial and Residential Metering	0	0	0	0	0	0	358,000	358,000	534,000	534,000
PME	0	0	0	0	0	0	300,205	304,905	179,905	139,700
Miscellaneous	177,491	6,649	0	0	0	0	0	0	0	0
Miscellaneous - Variance	0	0	0	0	0	0	0	0	0	0

Project Name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
System Renewal Gross Expenditures	551,605	238,838	524,863	443,588	677,000	637,670	1,006,470	1,264,316	946,322	1,262,597
System Renewal Capital Contributions	329,640	163,342	0	0	0	0	0	0	0	0
Net Sub-Total	221,965	75,497	524,863	443,588	677,000	637,670	1,006,470	1,264,316	946,322	1,262,597

Table 55 – Gross Fixed Asset Additions – System Service (App 2-AA)

Project Name	2022	2023	2024	2025	2026 Bridge	2027 Test	2028	2029	2030	2031
Cardinal - East Street - Dundas to John - Load Balancing	0	0	0	0	0	119,229	0	0	0	0
NRCAN - Reclosures & SCADA 2026	0	0	0	0	0	0	0	0	0	0
Cardinal - New Transformer + Fan	0	0	0	0	450,000	0	0	0	0	0
NRCan - SCADA - Iroquois	0	0	0	0	320,000	0	0	0	0	0
NRCan - SCADA - Cardinal	0	0	0	0	0	480,000	0	0	0	0
NRCan - SCADA - Prescott MS2	0	0	0	0	0	160,000	0	0	0	0
NRCan - SCADA - Prescott MS3	0	0	0	0	0	320,000	0	0	0	0
Replacement Meters	0	0	0	80,338	0	0	0	0	0	0
Next Polymers - 2418	0	0	0	43,461	0	0	0	0	0	0
MS2 Morrisburg Relocation	314,258	0	0	0	0	0	0	0	0	0
MS1 Upgrade Iroquois	12,225	0	0	0	0	0	0	0	0	0
MS1 Upgrade Morrisburg	0	0	0	0	0	0	0	0	0	0
MS2 Morrisburg Relocation	0	849,682	0	0	0	0	0	0	0	0
MS1 Upgrade Iroquois	0	28,175	0	0	0	0	0	0	0	0
MS1 Upgrade Morrisburg	0	7,142	0	0	0	0	0	0	0	0
Cardinal Hwy 2 Rebuild	0	83,788	0	0	0	0	0	0	0	0
MS2 Morrisburg Relocation	0	0	1,784	0	0	0	0	0	0	0
MS1 Upgrade Morrisburg	0	0	73,861	0	0	0	0	0	0	0
Iroquois Transformer Cty Rd 2 (Ferrante) - 2404	0	0	57,823	0	0	0	0	0	0	0
Transformer Replacements	0	0	0	0	0	0	0	0	0	0
Miscellaneous	7,913	0	0	0	0	0	0	0	0	0
Carmen Rd Rebuild - 2415	0	0	4,159	0	0	0	0	0	0	0

Project Name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
System Service Gross Expenditures	334,397	968,787	137,627	123,800	770,000	1,079,229	0	0	0	0
System Service Capital Contributions	0	0	0	0	0	0	0	0	0	0
Net Sub-Total	334,397	968,787	137,627	123,800	770,000	1,079,229	0	0	0	0

Table 56 – Gross Fixed Asset Additions – General Plant (App 2-AA)

Project Name	2022	2023	2024	2025	2026 Bridge	2027 Test	2028	2029	2030	2031
Office Furniture (4) and Facilities (15) 2026	0	0	0	0	19,000	19,000	0	0	0	0
Computer Hardware - 1920	19,583	6,308	8,625	4,339	16,000	16,000	0	0	0	0
Tools - 1940	4,601	10,370	10,952	16,817	15,000	15,000	0	0	0	0
Computer Software	38,268	66,150	7,000	0	15,000	15,000	0	0	0	0
Vehicle - 1920	0	127,236	0	32,153	1,225,628	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0	0	0	0	0
Vehicle ¾ Ton	0	0	0	0	0	0	95,000	0	0	0
Rear Lot Derrick	0	0	0	0	0	0	307,000	0	0	0
Digger	0	0	0	0	0	0	0	0	0	700,000

Project Name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
General Plant Gross Expenditures	62,452	210,064	26,576	53,309	1,290,628	65,000	0	0	0	0
General Plant Capital Contributions	0	0	0	0	0	0	0	0	0	0
Net Sub-Total	62,452	210,064	26,576	53,309	1,290,628	65,000	0	0	0	0

Capital Expenditure Variance Analysis (2022 DSP vs Actual)

RSL has compared actual capital expenditures for the 2022–2026 period against the capital plan approved as part of its 2022 Cost of Service application.

Overall, actual capital expenditures exceeded the 2022 DSP plan, primarily due to a higher-than-forecast level of System Access and customer-driven investments across the service territory. This increase reflects a material change in development activity relative to the prior planning period, including residential, commercial, and institutional growth.

A number of capital projects identified in the 2022 DSP were deferred, re-scoped, or replaced with alternative investments based on updated asset condition information, changing system priorities, and emerging customer requirements. In several cases, lower-cost alternatives were implemented (e.g., refurbishment or oil replacement in place of full asset replacement), or projects were reprioritized to address higher-risk or higher-impact needs.

In addition, RSL completed a number of material customer-driven projects that were not specifically identified at the individual project level in the 2022 DSP. These investments were required to meet obligations under the Distribution System Code to provide timely system access and were consistent with the overall capital planning framework and approved investment categories.

Further detail on both planned and unplanned material projects, including project scope, timing, and cost drivers, is provided in the Material Project Write-Ups included in Appendix A of this DSP.

The most significant drivers of variance between planned and actual capital expenditures include:

- Increased System Access investments driven by subdivision development, commercial connections, and customer-driven projects
- Timing differences and re-scoping of System Renewal projects based on updated asset condition assessments
- Completion of major system projects, including the Morrisburg MS2 relocation, with scope and timing changes
- One-time or accelerated General Plant investments required to support operations

Detailed quantitative reconciliation, including project-level comparisons of planned and actual expenditures, is provided in Exhibit 2 of the Application.

No variances are attributable to non-distribution activities.

7. JUSTIFYING CAPITAL EXPENDITURE AND MATERIAL INVESTMENTS

Detailed information supporting Sections 6 (Capital Expenditure Plan), 7 (Justifying Capital Expenditure), and 8 (Material Investments) is provided in Appendix A, Material Project Write-Up, including project descriptions, drivers, and justification

APPENDIX A – PROJECT WRITE-UP

Reconciliation vs Material Project 2022 – 2026 submitted in the 2022 COS DSP

Year	Category	Project Name	DSP Plan	Actual
‘22	System Renewal	PCB Transformer Replacements	$58,698	$350,158
‘23	System Renewal	PCB Transformer Replacements	$58,698	
‘24	System Renewal	PCB Transformer Replacements	$58,698	
‘25	System Renewal	PCB Transformer Replacements	$58,698	
‘22	System Renewal	Morrisburg High Street Replace Small Conductor	$52,974	De-Prioritized
‘22	System Access	Morrisburg MS - Relocate Phase 1	$500,000	$1,239,585
‘23	System Access	Morrisburg MS - Relocate Phase 2	$500,000	
‘23	System Renewal	Cardinal Hw2 E Replace Small Conductor	$54,337	$83,788
‘23	General Plant	IVR System	$50,000	Completed without Capital
‘23	General Plant	Replace 2015 ¾ Ton Foreman Truck	$65,000	$96,302
‘24	System Renewal	Iroquois Church Street Side Rear Lot Bay St. to Elizabeth	$112,809	$192,950
‘24	System Renewal	Prescott MS1 Transformer Replacement	$250,000	Replaced oil instead to minimize costs
‘24	General Plant	Elster/Olameter Smart Meter Upgrade	$50,000	$19,312
‘25	System Renewal	Kyle St. S rear lot Farlinger Ave to Laurier Rebuild	$92,373	De-Prioritized
‘25	System Renewal	Kington Cres - Replace Poletrans	$93,929	De-Prioritized for Cardinal Reid St.
‘25	System Renewal	Iroquois MS1 Transformer Replacement	$250,000	Rescoped to 2026
‘26	System Renewal	Prescott Roberta Cres - Pole Replacement	$50,192	De-Prioritized
‘26	System Renewal	MS#4 - New Feeder Boundary St. To Commercial	$150,000	De-Prioritized
‘26	General Plant	2010 Altec Service Truck is 16 years old	$400,000	$493,910

Additional Material Projects completed 2022-2025.

During the 2022–2025 period, RSL experienced a materially higher volume of System Access and customer-driven capital requests than in the prior five-year period. Increased residential, commercial, and institutional development activity across the service territory resulted in a number of projects that were individually material but collectively aligned with approved capital envelopes and policy obligations.

These projects were largely reactive, customer-initiated, or timing-driven, and therefore were not all individually forecast at the project level in advance. Collectively, they reflect growth-related investment, system renewal, and the requirement under the Distribution System Code to provide timely system access.

Years	Category	Project Name	DSP Plan	Costs
‘22- ‘23	System Access	Prescott Arena	$0	$175,515
‘22- ‘25	System Access	Westport Subdivision	$0	$221,560
‘22- ‘24	System Access	Bell Fibre to the Home	$0	$633,398
‘22- ‘24	System Access	MacEwans Edward Street	$0	$132,167
2023	General Plant	Computer Software	$25,000	$66,150
‘23- ‘24	System Access	Quality Inn Hotel	$0	$73,075
2024	System Renewal	Cardinal Reid Street Poletrans	$0	$80,770
‘24- ‘25	System Access	Morrisburg Tesla EV Supercharger	$0	$123,377
‘24- ‘25	System Access	Iroquois – Ferrante Commercial + Ap	$0	$128,557
‘24- ‘25	System Access	Morrisburg Housing	$0	$104,602
2025	System Access	Iroquois Seaway Highschool	$0	$119,189
2025	System Access	Morrisburg – Saf Warehouse	$0	$112,291
2022	System Renewal	Meter Replacements	$30,000	$55,012
2023	System Renewal	Meter Replacements	$30,000	$42,875
2024	System Renewal	Meter Replacements	$30,000	$67,393
2025	System Renewal	Meter Replacements	$30,000	$80,338
2022	System Access	Misc.	NA	$114,861
2023	System Access	Misc.	NA	$54,958
2024	System Access	Misc.	NA	$226,133
2025	System Access	Misc.	NA	$386,852

2022 – 2025 Forecasted Material Projects Section

1 - PCB Transformer Replacements – System Renewal

Project Numbers: CP2202, CP2302, CP2402, CP2502 Asset Class: Overhead Distribution Location: All Service Areas Project Priority: High		
	Forecasts Costs	**Actual Costs**
2022	**$58, 698**	**$0**
2023	**$58, 698**	**$0**
2024	**$58, 698**	**$17,476**
2025	**$58, 698**	**$332,681**
Total	**$234,792**	**$350,157**

Project Overview

This multi-year system renewal initiative replaced all remaining non-station distribution transformers in the RSLD service territory containing polychlorinated biphenyls (PCBs) in excess of 50 mg/kg (50 ppm), in order to meet federal environmental requirements and improve system safety and compliance.

The program was planned and executed over a four-year period (2022–2025) and was fully completed by early December 2025.

Project Scope:

The project involved the replacement of transformers at **39 locations** across the service territory, representing a total of 43 **distribution transformers**. All identified transformers exceeded the 50 ppm PCB threshold established under federal environmental regulations.

For each location, RSLD:

- Reviewed historical PCB sampling results and asset condition.
- Assessed transformer loading and capacity requirements.
- Developed construction designs appropriate to site conditions.

While many locations involved straightforward transformer replacements, several required additional make-readies work to bring pole configurations and electrical clearances into compliance with updated build standards. This included updated spacing, revised conductor configurations, and safety improvements.

Project Driver:

The primary driver for this project was regulatory compliance and environmental protection, specifically:

- Elimination of PCB-containing equipment above regulated thresholds.

- Reduction of environmental and public safety risk associated with aging assets.
- Compliance with updated electrical safety standards.

This project was non-discretionary in nature.

Options Considered:

For each identified transformer location, RSLD evaluated the following alternatives:

1. **Resampling and Verification**
   Transformers with PCB concentrations between 50 ppm and 55 ppm were resampled to confirm the validity of earlier results and assess whether replacement could be deferred.
   - No transformers tested below the regulatory threshold upon resampling.
   - This process provided confidence in the sampling methodology and confirmed the need for replacement.
2. **Oil Drain and Replacement**
   For transformers with high replacement costs and relatively high remaining useful life draining and replacing insulating oil was considered. Some examples are the larger transformers utilized by the grocery store. Ultimately, no distribution transformers met the technical and economic criteria for this option. This approach was applied separately to a large station transformer, where appropriate.

Replacement was determined to be the most prudent and compliant option for all distribution transformers within the scope of this project.

Risk of Deferral

Deferral of this project would have resulted in:

- Non-compliance with federal environmental regulations.
- Increased environmental liability exposure.
- Elevated safety risks to employees, the public, and the environment.

As such, further deferral was not a viable option.

Outcomes and Benefits

The project delivered the following outcomes:

1. Full compliance with PCB regulatory requirements.
2. Reduced environmental and safety risk across the distribution system.
3. Improved compliance with Ontario Regulation 22/04, including:
   - Improved pole and equipment spacing.
   - Elimination of legacy delta configurations and addition of neutral conductors where required.

1. Renewal of aging distribution assets, supporting long-term system reliability.

Project Status and Timing

All PCB-containing distribution transformers were removed from service by early December 2025.
Final disposal of removed transformers was completed in 2026 in accordance with environmental handling requirements. The overall cost increased due to the trouble sourcing transformers coming out of the pandemic and the increase in transformer pricing.

2 - Morrisburg High Street Replace Small Conductor – System Renewal

Project Numbers: CP2207 Asset Class: Overhead Distribution Location: Morrisburg Project Priority: Medium (Deferred)		
	Forecasts Costs	**Actual Costs**
2022	**$52,973.80**	**$0**
Total	**$52,973.80**	**$0**

Project Overview

This project was identified as a system renewal initiative to replace small primary conductors in the Morrisburg High Street area that no longer align with current safety and design standards. While the project was included in the capital plan, it was not completed, as other higher-priority renewal and customer connection projects were advanced ahead of it. No capital costs were incurred.

Project Scope:

Small conductors, defined as #2 AWG and smaller, have been identified by the Electrical Safety Authority (ESA) as presenting elevated safety risks for line work. In some cases, utilities restrict live-line work on small conductors, requiring de-energization and resulting in customer interruptions.

The existing #4 solid copper primary conductor in this area reflects an older design standard and is more susceptible to damage during high wind events. The circuit was originally constructed in the late 1950s, and the majority of assets in the area have:

- Reached or exceeded their Typical Useful Life (TUL); and
- Received poor visual inspection condition ratings.

The planned scope included:

- Replacement of approximately 350 metres of primary conductor.
- Replacement of 9 distribution poles; and
- Transfer and renewal of approximately 28 customer services.

All replacement work would have been constructed in accordance with current RSLD design and safety standards.

Project Driver:

The primary drivers for this project were:

- System renewal, addressing aging infrastructure.
- Worker safety, by eliminating small conductors that constrain live-line work practices; and

- Customer reliability, by reducing the likelihood of conductor failures and improving operational flexibility.

Secondary benefits included reduced electrical losses associated with undersized conductors.

Options Considered:

Options considered were limited to alternative overhead construction designs intended to balance reliability, safety, and cost. No reasonable non-wires or partial mitigation alternatives were available to address the underlying risks associated with small conductor infrastructure.

Risk Deferral

While the project addresses legitimate renewal and safety considerations, the risks associated with deferral were assessed as manageable in the near term. Deferral may incrementally increase the likelihood of service interruptions and operational constraints over time; however, these risks were considered acceptable relative to other system priorities.

Outcomes and Benefits,

RSL made a deliberate decision to deprioritize this project in order to advance:

- Higher-risk system renewal work; and
- Customer connection projects with immediate service and capacity implications.

This reflects active capital portfolio management and prudent allocation of limited resources.

Project Cost and Timing

The project was not completed and remains a candidate for future system renewal prioritization as part of RSLD's ongoing asset management and capital planning processes.

3 - Morrisburg MS Relocation – System Renewal/System Service

This project was submitted at the COS and written into an ACM at the settlement.

Project Numbers: CP2211, CP2311 **Asset Class: Station** **Location: Morrisburg** **Priority: High**		
	Forecasts Costs	**Actual Costs**
2022	**$500,000**	**$314,258**
2023	**$500,000**	**$849,682**
2024	**-**	**$75,645**
2025	**-**	**-**
Total	**$1,000,000**	**$1,239,585**

Project Scope:

The project included the procurement of a new station transformer and the expansion of the Morrisburg MS1 station to accommodate both MS1 and MS2 at a single consolidated site.

Project Driver:

The project was driven by the need to replace an aging distribution transformer at Morrisburg MS2, while simultaneously addressing the requirement to serve new and growing loads in the central area of Morrisburg.

The existing MS2 station—constructed prior to the formation of RSL—was located far from where load growth was occurring. Rather than replacing the transformer at the existing MS2 site and constructing a long feeder line into town, a more cost-effective and operationally efficient solution was to relocate MS2 to the centre of town, adjacent to the existing Morrisburg MS1 station.

Options Considered

1. **Replace the transformer at the existing MS2 site and build a feeder into town**
   This option was not cost-effective and would have resulted in a long feeder, increasing system vulnerabilities, operational risk, and electrical losses.
2. **Acquire a new property to construct two separate stations closer to load**
   This option was considered but was less cost-effective than utilizing the available space at the existing MS1 site.

The selected approach—co-locating MS2 with MS1—represented the lowest-cost and lowest-risk solution while improving overall system performance.

Risk of Deferral

Deferring this project would have exposed the utility to increased risks associated with an aging transformer and the inability to serve new customer loads in a timely manner. Long feeder alternatives would also have resulted in higher reliability risk, increased outage exposure, and higher system losses, as well as cost escalation over time.

Outcomes and Benefits

This project enabled RSL to efficiently connect significant customers, including **Safavieh** and **Cornwall Housing** developments in Morrisburg. The relocation and consolidation approach achieved these connections in the most cost-effective manner while improving system reliability, reducing feeder length, and strengthening overall station resilience.

Project Cost and Timing

The consolidated station was energized and placed into service in 2023. Work included the reconfiguration and redesign of poles and associated infrastructure around the MS1 site to accommodate the relocated MS2 equipment. In 2024, additional work was completed to finalize the removal of the old MS2 station transformer and associated legacy infrastructure.

4 - Cardinal Hwy 2 E Replace Small Conductor – System Renewal

Project Numbers: CP2207 Asset Class: Overhead Location: Morrisburg Priority: Medium		
	Forecasts Costs	**Actual Costs**
2023	**$54,698**	**$83,788**
Total	**$54,698**	**$83,788**

Project Scope:

This project replaced undersized primary conductor that no longer met current safety and reliability expectations. Small conductor (defined as #2 AWG and smaller) has been identified by the Electrical Safety Authority (ESA) as posing increased safety risk. In many cases, work on these conductors requires de-energization of the line, resulting in customer outages.

The affected line section was constructed in the late 1950s and consists of infrastructure that has largely reached or exceeded its Typical Useful Life (TUL), with poor visual inspection ratings. The project scope included:

- Replacement of approximately 500 metres of #4 ACSR primary conductor with 3/0 ACSR, in accordance with current RSL design standards
- Replacement of 10 poles to meet current structural and joint-use loading requirements
- Replacement of one distribution transformer

All work was completed in accordance with current RSL standards and ESA safety requirements.

Project Driver:

The primary driver for this project was addressing the aging infrastructure, maintain the system reliability, while prioritizing worker safety. The existing #4 ACSR conductor did not meet current safety expectations, particularly for live-line work, and routinely required outages to protect workers.

Pole replacements were also required to meet modern ice and wind loading standards and to better support joint-use attachments, including sections located on Hydro One joint-use poles. The upgraded conductor and structures allow work to be performed safely and efficiently while reducing the need for customer interruptions.

The work was designed and installed in compliance with Ontario Regulation 22/04, inspected by RSL staff, and formally approved as safe prior to energization.

Options Considered:

Initial review confirmed that replacement of the small conductor represented a high-value investment from a safety and reliability perspective. Design options focused on optimizing overhead construction to maximize reliability while minimizing cost.

No viable alternatives existed that would adequately mitigate the identified reliability and safety risks without conductor replacement.

Risk Deferral

Deferral of this project would have continued to expose line workers to elevated safety risk and increased the likelihood of in-service failures. Aging conductor and structures are more susceptible to failure during severe weather events such as high winds and ice loading, increasing the risk of outages and extended restoration times.

Outcomes and Benefits,

The project was successfully completed and resulted in:

- Improved worker safety by eliminating undersized conductor.
- Compliance with ESA requirements and Ontario Regulation 22/04
- Reduced outage risk associated with aging infrastructure.
- Improved system reliability and resilience during severe weather events

Project Cost and Timing

The project was completed in 2023. While system access and capacity projects were prioritized within the capital plan, this renewal project remained essential due to the age of the infrastructure and the associated safety risks.

5 - IVR System (Interactive Voice Response) – General Plant

This project was delayed and completed in 2025 because RSL staff found a more cost-efficient way to accomplish the upgrade avoided capital expenditure and relied upon a Voice over IP phone system upgrade in 2024 that came with the feature of IVR.

Project Numbers: CP2313 Asset Class: General Plant Location: All Priority: Medium		
	Forecasts Costs	**Actual Costs**
2023	**$50,000**	**$0**
Total	**$50,000**	**$0**

Project Scope:

An Interactive Voice Response (IVR) system provides automated inbound and outbound telephone functionality to improve customer communication and service efficiency. IVR systems integrate with the Local Distribution Company's (LDC's) telephone platform and Customer Information System (CIS).

Planned functionality included:

- Inbound customer self-service, such as account balance inquiries
- Potential for automated phone payments, subject to coordination with a third-party payment processor
- Outbound automated calling for planned power outage notifications, customer service messaging, and collections.

IVR systems have been widely adopted across Ontario LDCs and are considered a standard component of modern customer service delivery.

Project Driver:

The primary driver for this project was to **replace manual customer communication processes**—particularly for planned outage notifications—with automated, timely, and scalable solutions. The project also supported broader objectives of improving customer responsiveness and modernizing customer-facing technology.

Options Considered:

During planning in 2023, the management team completed a comprehensive assessment of RSL's telephone systems. Through this review, management identified an opportunity to transition from an aging Mitel/Cisco landline-based system to a modern Voice over IP (VoIP) platform. The VoIP solution introduced enhanced functionality, including AI-enabled automated responses, and fully addressed the requirement for inbound IVR capabilities.

Following implementation of the VoIP platform, the team evaluated options for outbound customer notification services to determine whether a standalone IVR capital investment could be avoided. Through this review, management identified Paymantus as a solution capable of delivering outbound notifications, including planned outage messaging and customer communications.

This integrated approach allowed RSL to achieve the intended IVR functionality through operating expenditures, eliminating the need for a standalone capital IVR system, and delivering the required capabilities at a lower overall cost than originally planned.

Risk Deferral

Deferring IVR functionality would have continued reliance on manual customer contact processes, limiting response speed during outages and increasing staff workload. Continued dependence on legacy landline technology also posed operational and supportability risks due to aging infrastructure.

These risks were mitigated through the VoIP implementation, which addressed both technology obsolescence and customer service efficiency.

Outcomes and Benefits,

Key outcomes and benefits of this approach included:

- Delivery of IVR functionality without capital expenditure
- Improved customer response times and communication consistency
- Transition away from aging landline technology to a modern VoIP platform.
- Enhanced scalability and flexibility, including AI-enabled automated responses.
- Overall reduction in lifecycle cost relative to a standalone IVR capital system.

Project Cost and Timing

Although originally planned as a 2023 capital project, the IVR initiative was delivered through system modernization initiatives implemented in later years. The VoIP platform was deployed in the second half of 2024, with IVR and AI features fully implemented, tested, and placed into service in the second half of 2025.

6 - Vehicle – Foreman Truck ¾ Ton Replacement – General Plant

Project Numbers: CP2403 **Asset Class: Overhead** **Location: Iroquois** **Priority: High**		
	Forecasts Costs	**Actual Costs**
2023	**$65,000**	**$96,302**
Total	**$65,000**	**$96,302**

Project Scope:

This project involves the replacement of an 8-year-old 2015 ¾ Ton pickup truck with 250,000km utilized by the Foreman, which has reached the end of its reliable service life. Rust was beginning to show in the vehicle and continued operation is no longer economical or reliable.

RSL maintains a fleet of three (3) pickup trucks, each assigned to critical operational roles:

- Operations Manager – customer- and developer-facing role
- Trouble Call Vehicle – used for emergency response.
- Foreman / Lead Hand – capable of towing trailers

The foreman truck is the larger one of the 3 at ¾ tons because it is utilized to tow equipment – Reels Trailers, Dump Trailers, Pole Trailers to and from the job sites.

Project Driver:

The primary driver for this project is the vehicle reaching the end of its reliable useful life, with confirmed internal engine deterioration significantly increasing the risk of:

- Sudden mechanical failure
- Unplanned service interruptions
- Escalating repair and rental costs

Options Considered:

1. Alternative Vehicle Types

Other vehicle types were evaluated. SUVs and smaller ½ ton trucks were determined to be not suitable, as they do not provide sufficient payload capacity, towing capability, or equipment storage required for emergency response and field operations.

2. Longer or Shorter Replacement Cycles

RSL aims to balance reliability, cost control, and operational readiness. Service vehicles are typically replaced after 7-8 years or approximately 200,000 km, which optimizes lifecycle cost and minimizes failure risk.

Where vehicles are inspected and confirmed to be in good mechanical condition, service life extensions are utilized to defer capital expenditures. The 2015 ¾ Ton vehicle condition does not support further extension.

3. Vehicle Leasing or Rentals

Vehicle leasing and long-term rentals were considered but found to be more costly than ownership due to the high annual mileage associated with RSL's geographically dispersed service territory.

Risk Deferral

Deferring this replacement would expose RSL to a risk of equipment failure potentially resulting in:

- Significant unplanned repair expenses
- Loss of emergency response capability
- Increased reliance on rental vehicles or external contractors

Outcomes and Benefits

- Maintains safe and reliable fleet operations.
- Ensures continued emergency response capability.
- Reduces reliance on rental vehicles.
- Reduces reliance on external contractors for trouble calls.
- Improves fleet resiliency and lifecycle management.

Project Cost and Timing

In service year of 2023 estimated at a cost of $96,302

7 - Iroquois Church Street Side Rear Lot Bay St. to Elizabeth – System Renewal

Project Numbers: CP2403 Asset Class: Overhead Location: Iroquois Priority: High		
	Forecasts Costs	**Actual Costs**
2024	**$112,809**	**$127,850**
2025	**-**	**$65,100**
Total	**$112,809**	**$192,950**

Project Scope:

This project replaced aging primary and secondary conductors and associated distribution infrastructure that no longer met current safety and reliability standards. The affected area was constructed in the late 1950s, and the majority of assets had reached or exceeded their Typical Useful Life (TUL), with poor visual inspection ratings.

The scope of work included:

- Replacement of approximately 375 metres of #2 copper stranded primary conductor with current standard conductor (typically 1/0 ACSR, based on loading)
- Replacement of #2 copper secondary bus
- Replacement of 14 poles to meet current structural, ice, and wind loading standards
- Replacement of 3 distribution transformers
- Replacement of approximately 700 metres of secondary conductor
- Replacement of 42 customer services

All replacements were completed in accordance with current RSL construction standards and Electrical Safety Authority (ESA) requirements.

Project Driver:

Efficiency, Customer Value, and Reliability
Aging infrastructure increases the likelihood of in-service failures and customer outages, particularly during severe weather events such as high winds and ice loading. Replacing conductors, poles, transformers, and services significantly reduced outage risk and improved system resilience.
Where feasible, transformers were relocated closer to the street to improve accessibility and support faster power restoration during outage events.

Safety
Due to the age and condition of the existing infrastructure, all work on this line section required full de-energization to protect worker safety. The replacement of undersized and aging #2 copper conductors eliminated elevated safety risks and enabled the system to meet current safety expectations.

New poles were installed to support modern loading and joint-use requirements. All construction was completed in compliance with Ontario Regulation 22/04, inspected by RSL staff, and formally approved prior to energization.

Options Considered:

An initial assessment confirmed that this project represented a high-impact investment from a safety and reliability perspective. Design alternatives focused on optimizing overhead construction to maximize reliability while minimizing cost.

No viable alternatives existed that would adequately mitigate the identified safety risks without full conductor and asset replacement.

Risk Deferral

Deferring this project would have continued to expose line workers to elevated safety risks and increased the probability of infrastructure failure. Given the age of the assets, deferral would have heightened outage risk and potentially resulted in longer restoration times during severe weather events.

Outcomes and Benefits

The project was successfully completed and resulted in:

- Improved worker safety and compliance with Ontario Regulation 22/04
- Elimination of undersized and end-of-life conductors
- Improved system reliability and reduced outage risk
- Enhanced resiliency of the distribution system in the Iroquois area

Project Cost and Timing

The project was completed in 2024 and exceeded the original forecast. The cost variance was primarily attributable to inflationary pressures, including higher transformer costs and increased contractor labour rates experienced during the construction period.

8 - Prescott MS1 Transformer Replacement – System Renewal

The objective of the project was accomplished through a different means for lower costs.

Project Numbers: CP2410 **Asset Class: Station** **Location: Prescott** **Priority: High**		
	Forecast Capital Costs	**Actual Capital Costs**
2024	**$250,000**	**$0**
Total		

Project Scope:

Prescott MS1 was originally constructed in 1965. During routine maintenance and oil testing, the station transformer was found to contain polychlorinated biphenyls (PCBs) above regulatory thresholds. Given the transformer's age and increasing load requirements in the Prescott service area, the original scope contemplated replacing the existing transformer with a 5 MVA unit, which has been established as the current station standard size.

Project Driver:

Regulatory and Environmental Compliance
The primary driver for this project was compliance with federal PCB regulations and mitigation of environmental risk associated with a potential PCB oil release. The presence of PCBs created a regulatory obligation to address the issue in a timely manner.

System Capacity and Load Growth
Increasing electrical demand associated with development in the Prescott area initially supported upsizing the station transformer to 5 MVA to ensure sufficient capacity and long-term system reliability.

Options Considered:

Management evaluated several approaches to address both the regulatory and system capacity requirements:

1. Full transformer replacement with a 5 MVA unit
   This option addressed both PCB compliance and load growth but presented a significant capital cost that exceeded the planned budget due to escalating transformer prices.

2. Confirmatory testing and targeted PCB remediation
   Given the magnitude of the capital expenditure, additional sampling was conducted to reconfirm PCB concentrations. Following confirmation, RSL pursued an alternative solution by replacing the transformer oil, eliminating PCBs without replacing the transformer itself. This approach achieved regulatory compliance at a substantially lower cost and was completed through operating expenditures.

3. Alternative capacity solution
   In parallel, RSL assessed customer load requirements and identified that capacity needs could be more efficiently met by supplying load through a new 44 kV feed, rather than increasing transformer capacity at Prescott MS1. This approach was both lower cost and better aligned with customer requirements.

The combined approach eliminated the need for a capital transformer replacement while fully addressing regulatory and system needs.

Risk Deferral

The primary risk associated with deferral was regulatory non-compliance, specifically under federal PCB regulations administered by Environment and Climate Change Canada. This risk was mitigated through timely PCB oil replacement.

Outcomes and Benefits

The selected approach delivered the following outcomes:

- Full compliance with PCB regulatory requirements
- Elimination of environmental risk associated with PCB-contaminated oil.
- Avoidance of a $250,000 capital expenditure
- Efficient accommodation of load growth through alternative system configuration
- Improved cost-effectiveness compared to full transformer replacement

Project Cost and Timing

The regulatory objectives of the project were achieved in 2024 through operating expenditures rather than capital investment. Load growth requirements were addressed through system reconfiguration and the introduction of a 44 kV supply, eliminating the need for transformer upsizing at Prescott MS1.

9 - Elster Olameter Upgrade – General Plant

This upgrade was completed was pulled up and completed in 2022.

Project Numbers: CP2412 Asset Class: General Plant Location: All Locations Priority: High		
	Forecasts Costs	**Actual Costs**
2023	**-**	**$19,313.16**
2023	**-**	**-**
2024	**$50,000**	**-**
Total	**$50,000**	**$19,313.16**

Project Scope:

RSL utilizes Elster smart meters and the Olameter platform to support automated meter data retrieval across its service territory. As with all Advanced Metering Infrastructure (AMI) systems, periodic software and firmware upgrades are required to maintain compatibility with evolving operating environments and technology standards.

The project scope included upgrades to collector firmware and associated system components required to maintain reliable smart meter communications and data collection.

Project Driver:

The primary driver for this project was system renewal of the AMI infrastructure used to collect customer consumption data. The existing collector firmware and supporting technology had reached a point where continued operation without upgrade posed a risk to data reliability and system performance.

Maintaining automated meter reading capability is essential to billing accuracy, operational efficiency, and customer service.

Options Considered:

Management evaluated alternative approaches, including:

- Assessing whether alternative collector technologies or suppliers could provide a lower-cost solution; however, comparable pricing across vendors and the requirement to change meter technology made this option impractical.
- Evaluating manual meter reading as a temporary alternative; this option was determined to be infeasible due to staffing requirements and operational inefficiency.

Based on this assessment, maintaining the existing Elster/Olameter technology and upgrading the required infrastructure was identified as the most cost-effective and operationally sound approach.

Risk Deferral

Deferring this project would have placed the utility at risk of losing automated meter data collection capability, potentially requiring manual meter reading and additional staffing resources. This would have increased operating costs and introduced risks to billing accuracy and timeliness.

Outcomes and Benefits

Completion of the upgrade resulted in:

- Continued reliable operation of RSL's Advanced Metering Infrastructure (AMI)
- Preservation of automated meter reading and billing processes
- Reduced operational risk associated with aging firmware and technology.
- Improved system stability and compatibility with evolving technology standards

Project Cost and Timing

The project was advanced and completed in 2022, earlier than originally forecast, due to the earlier-than-expected need for system replacement. Actual costs were non-material relative to forecast, reflecting the limited scope of the upgrade and effective cost management.

10 - Kyle St. S rear lot Farlinger Ave to Laurier Rebuild – System Renewal

This project was not complete due to the prioritization of resources.

Project Numbers: CP2503 **Asset Class: Overhead** **Location: Morrisburg** **Priority: Medium**		
	Forecasts Costs	**Actual Costs**
2025	**$92,373**	**$0**
Total	**$92,373**	**$0**

Project Scope:

This project is intended to replace aging primary and secondary conductors and associated overhead infrastructure that no longer meet current safety and reliability standards. The affected rear-lot construction was installed in the late 1950s, and the majority of assets have reached or exceeded their Typical Useful Life (TUL), with poor visual inspection ratings.

The planned scope includes:

- Replacement of approximately **900 metres of #2 copper stranded primary conductor** with current standard conductor (typically 1/0 ACSR, based on loading)
- Replacement of **#2 copper secondary bus**
- Replacement of **15 poles** to meet current structural and joint-use loading standards
- Replacement of approximately **30 customer services**

All work would be completed in accordance with current RSL standards and Electrical Safety Authority (ESA) requirements.

Project Driver:

System Renewal and Safety

Due to the age and condition of the existing infrastructure, work on this line section currently requires full de-energization to protect worker safety. Replacement of undersized and end-of-life conductors would reduce safety risks and allow the system to meet current standards.

Pole replacements would address modern ice and wind loading requirements and improve support for joint-use attachments. Construction would comply with Ontario Regulation 22/04 and be inspected and approved prior to energization.

Reliability and Customer Impact

Aging conductors and structures increase the likelihood of in-service failures, particularly during severe weather events such as high winds and ice loading. Replacement would reduce outage risk, improve system resilience, and support more efficient restoration.

Options Considered:

The option selected for 2025 was **deferral** due to resource constraints. Construction resources were redirected to higher-priority safety, capacity, and regulatory-driven projects within the capital program.

Risk Deferral

Deferring the project maintains existing safety risks for line workers, ongoing reliability exposure due to aging infrastructure, and continued system losses. While the risks are manageable in the short term, they increase over time as assets continue to deteriorate.

Outcomes and Benefits

The intended outcomes of this project include improved worker safety, enhanced system reliability, reduced outage risk, and improved efficiency through system renewal. These outcomes were **not realized** in 2025 due to the reallocation of resources to higher-priority projects.

Project Cost and Timing

The project was not completed in 2025. No capital expenditures were incurred as resources were allocated to projects with higher priority within the overall capital program. The project remains a candidate for future execution subject to resource availability and prioritization.

11 - Prescott Kington Cres - Replace Poletrans – System Renewal

Project Numbers: CP2504 **Asset Class: Underground** **Location: Prescott** **Priority: Medium**		
	Forecasts Costs	**Actual Costs**
2025	**$93,929**	**$0**
Total	**$93,929**	**$0**

Project Scope:

This project was intended to replace four pole-mounted “Pole Tran” transformers with a single pad-mounted transformer of equivalent capacity. The scope included completion of a detailed loading study to appropriately size the replacement transformer and ensure sufficient capacity to meet current and future customer demand.

Project Driver:

Safety
Pole Tran transformers represent an older equipment design in which the transformer is housed within a streetlight pole. Due to limited working space and constrained access, this configuration presents increased safety risks to line workers and no longer aligns with current RSL equipment standards. Replacement components for Pole Trans are also no longer readily available.
The proposed replacement would eliminate these safety risks and ensure compliance with Ontario Regulation 22/04, with all work inspected and approved by RSL staff prior to energization.

Efficiency, Customer Value, and Reliability
Aging Pole Tran infrastructure introduces reliability risk. While failures would likely result in localized outages, the lack of readily available replacement components could significantly extend restoration times. Replacement with a pad-mounted transformer would improve maintainability, reduce outage duration, and enhance overall system reliability.

Options Considered:

System renewal projects across the capital program were prioritized based on safety risk, coordination opportunities, and availability of internal and contractor resources.

As part of this prioritization:

- The Kingston Crescent project was deferred in favour of higher-priority system renewal work that included system access components.
- A separate Pole Tran replacement project on Reid Street in Cardinal was advanced due to coordination with the Township of Edwardsburgh/Cardinal’s water, sewer, and road resurfacing program, and the resulting five-year moratorium on future road cuts.

Risk Deferral

Deferral of this project maintains existing safety risks associated with Pole Tran equipment and continues exposure to reliability risk related to aging infrastructure and limited spare parts availability. While manageable in the short term, these risks increase as the equipment continues to age.
Overall, by advancing one Pole Tran replacement project in Cardinal in place of the Kingston Crescent project, the net system risk remained relatively neutral, while eliminating the risk of being unable to complete the Cardinal project in the future due to the municipal road cut moratorium.

Outcomes and Benefits

The intended outcomes of improved worker safety, enhanced reliability, and reduced outage restoration time at the Kingston Crescent location were not realized in 2025, as resources were reallocated to the higher-priority Pole Tran replacement project on Reid Street in Cardinal.

Project Cost and Timing

The project was not completed in 2025 and incurred no capital expenditures.
In 2024, RSL advanced a Pole Tran replacement project originally scheduled for 2027 on Reid Street in Cardinal to align with municipal road and underground infrastructure work and avoid a five-year post-construction moratorium. As a result, the Kingston Crescent Pole Tran project was deferred.
The project remains a candidate for future execution and is subject to ongoing system renewal prioritization and resource availability, with potential reconsideration in 2026 or beyond.

12 - Iroquois MS1 Transformer Replacement – System Renewal (RE-scoped)

This project was deprioritized in order to prioritize enabling a new station to build.

Project Numbers: CP2509 **Asset Class: Station** **Location: Iroquois** **Priority: High (re-scoped)**		
	Forecasts Costs	**Forecasted**
2025	**$250,000**	**-**
2026	**-**	**$950,000**
Total	**$250,000**	**$950,000**

Project Scope:

The community of Iroquois is supplied by a station originally constructed in 1953. In 2017, a second transformer was installed at the site to improve reliability by providing backup supply. Since that time, the newer transformer has become the primary supply, with the original transformer serving as backup and identified as requiring renewal.

The original scope included replacement or refurbishment of the aging backup transformer to improve safety and maintain reliability.

Based on the growing customers and new subdivision planned in Iroquois, the original transformer replacement project was deprioritized and replaced with a broader station development initiative to address capacity the capacity needs and address reliability needs with a second station rather than a back-up transformer.

Project Driver:

Safety and Asset Condition

Given the age of the original station infrastructure, some components no longer meet current standards. Replacement would improve worker safety and bring equipment in line with modern station design requirements.

Reliability and Capacity

While the original driver focused on maintaining backup capability, system planning identified a broader reliability risk associated with relying on a single station to serve the growing Iroquois community. Loss of a single transformer or station would result in a prolonged outage affecting the entire community.

Options Considered:

RSL undertook a detailed capacity and load assessment for the Iroquois service area. The analysis demonstrated that load levels were approaching 91% of station capacity, driven by community growth and planned developments, including the Valecraft – Merkley Oaks subdivision.

Rather than proceeding with a limited replacement of the backup transformer at MS1, management determined that a second distribution station would provide a more robust, long-term solution by:

- Adding meaningful capacity for near- and medium-term growth
- Providing true system redundancy rather than station-level backup only
- Significantly reducing vulnerability associated with serving the community from a single station.
- Enabling maintenance activities without extended customer outages

As a result, the original transformer replacement project was **deprioritized**, and capital funding was redirected toward enabling activities for a new station, including land acquisition, preliminary design, and capacity application work with Hydro One.

Risk Deferral

Deferring replacement of the backup transformer at MS1 was considered acceptable in the short term, given the presence of a newer primary transformer. However, continued reliance on a single-station configuration posed an increasing risk as load growth continued.

The re-scoped approach mitigates this risk by advancing a second station, which provides materially stronger system resilience than a like-for-like transformer replacement.

Outcomes and Benefits

While the original transformer replacement was not completed, the revised approach delivers greater long-term benefits, including:

- Improved system hardening and resiliency for the Iroquois community.
- Increased capacity to support residential growth and new development.
- Reduced risk of community-wide outages
- A more strategic use of capital aligned with long-term system planning.

Project Cost and Timing

The original CP2509 scope was not executed. Capital expenditures in 2025 reflect enabling work for a new distribution station, including land acquisition and preparatory activities required to support capacity applications and construction planning.

These activities position RSL to proceed with detailed design, regulatory approvals, and construction in 2026.

13 - Prescott Roberta Cres - Pole Replacement – System Renewal

Project Numbers: CP2603 Asset Class: Overhead Location: Prescott Priority: Medium		
	Forecasts Costs	**Actual Costs**
2026	**$50,192**	**$0**
Total	**$50,192**	**$0**

Project Scope:

This project was intended to replace aging primary and secondary conductors and associated overhead infrastructure that no longer meet current safety and reliability standards. The area was constructed in the late 1950s, and most assets have reached or exceeded their Typical Useful Life (TUL), with poor visual inspection ratings.

The planned scope included:

- Replacement of approximately 525 metres of #2 copper stranded primary conductor with current standard conductor (typically 3/0 Poly ACSR, selected due to heavily treed rear-lot conditions and loading requirements)
- Replacement of #2 copper secondary bus
- Replacement of 10 poles to meet current ice, wind, and joint-use loading standards
- Installation of one new distribution transformer
- Replacement of approximately 525 metres of secondary conductor
- Replacement of 10 customer services

All work would be completed in accordance with current RSL standards and Electrical Safety Authority (ESA) requirements.

Project Driver:

Safety

Small conductor (defined as #2 AWG and smaller) has been identified by the ESA as presenting elevated safety risk. Due to the age and condition of the existing infrastructure, all work on this line section currently requires full de-energization to protect worker safety, resulting in customer interruptions.

Replacing the existing conductor and poles would improve worker safety, reduce the need for planned outages, and ensure compliance with Ontario Regulation 22/04. All work would be inspected by RSL staff and approved prior to energization.

Reliability and Customer Impact

Aging conductors and structures increase the likelihood of in-service failures, particularly during severe weather events such as high winds and ice loading. Replacement would reduce outage risk, improve system resilience, and support faster restoration through improved access and modernized equipment placement.

Options Considered:

The primary option considered for this project was deferral, based on capital program prioritization and availability of internal and contractor resources. Higher-priority safety, capacity, and regulatory-driven projects were advanced ahead of this renewal work.

Risk Deferral

Deferring the project maintains existing safety constraints, including the need for de-energization during maintenance activities, and continues exposure to reliability risk associated with aging infrastructure. While risks are manageable in the near term, they increase as assets continue to deteriorate.

Outcomes and Benefits

The intended outcomes—improved worker safety, enhanced reliability, and reduced outage risk—were not realized, as the project was deprioritized in favour of higher-priority initiatives.

Project Cost and Timing

The project was not completed in 2026. No capital expenditures were incurred, as resources were allocated to projects with higher priority within the overall capital program. The project remains a candidate for future execution, subject to risk-based prioritization and resource availability.

14 - MS#4 - New Feeder Boundary St. To Commercial – System Access & System Service

Project Numbers: CP2602 **Asset Class: Station and Overhead** **Location: Prescott** **Priority: High**		
	Forecasts Costs	**Actual Costs**
2026	**$50,000**	**$0**
Total		

Project Scope:

The proposed project contemplated construction of a new distribution feeder from Boundary Street to the commercial area in north Prescott. The objective was to:

- Enable incremental customer growth and limited future expansion.
- Provide a second point of supply to the commercial area.
- Improve reliability through feeder redundancy.

At the time of initial planning, the commercial area was supplied by a single feeder with no back-up capability.

Project Driver:

System Access and Growth

The primary driver for this project was to enable additional commercial development along the Highway 401 corridor, including new hospitality and commercial customers. A second feeder was expected to provide both incremental capacity and improved reliability.

System Service (Reliability)

A secondary driver was to provide feeder back feed capability to reduce outage exposure for the commercial area.

Options Considered:

During early connection discussions, it was determined that:

- The initial commercial developments (including a hotel and a commercial customer) could be accommodated on the existing feeder without requiring a new distribution feeder.
- Smaller EV charging installations could also be supported on the existing distribution infrastructure.

However, subsequent growth projections and customer requests exceeded the capacity that a new distribution feeder alone could reasonably supply. Customers with very large load requirements, including large-scale EV charging, could not be accommodated even with back feeding.

As a result, RSL determined that a new 44 kV feeder was required to properly support long-term growth in this area. This higher-voltage solution provides significantly greater capacity and better aligns with future commercial and transportation-related development.

In addition, discussions with the Ministry of Transportation identified that the Highway 401 on-ramp configuration is expected to change within the next 5–10 years. Deferring lower-capacity distribution investments avoids stranded or redundant infrastructure once the final roadway design is confirmed.

Risk Deferral

The risk of not building the feeder is the lack of connection of new customers. Additionally, back feed capabilities are delayed for the future.

Outcomes and Benefits

The commercial customers were successfully developed on the existing feeders. Large EV implementations will be built utilizing a new 44kV feeder to the commercial area.

Project priority

- The system access for new customer was prioritized.
- The back feed for system service was not completed due to system requirements.

Project Cost and Timing

This project was not completed.

15 - Altec Single Bucket Service Truck Replacement (2010 Unit) – Fleet Renewal

Project Numbers: 2010 Altec Service Truck is 16 years old. **Asset Class: Fleet** **Location: System-Wide** **Priority: High (reactive Replacement)**		
	Forecasts Costs	**Actual Costs**
2026	$400,000	$493,910
Total	**$400,000**	**$493,910**

Project Scope:

This project replaced a 2010 Altec single-bucket service truck, which had reached 16 years of service. RSL operates a fleet of three large service trucks:

- One single-bucket truck
- One double-bucket truck
- One digger derrick

These trucks are critical assets used for emergency response, planned maintenance, and capital construction activities.

RSL has historically utilized fleet assets through their full useful life—and beyond where feasible—to minimize rate impacts. Proactive corrosion control measures, including regular oil spraying, were used to extend service life.

Project Driver:

Fleet Reliability and Operational Readiness

Service trucks are mission-critical assets. Continued reliability is required to maintain acceptable response times for outages, safety events, and customer service work. While life extension was pursued to reduce capital pressure, the age of the truck ultimately exceeded safe operating limits.

Asset Condition and Safety

In 2025, the upper turret of the truck was identified as structurally unsafe during routine inspection by operations staff and was independently confirmed by a heavy utility truck mechanic. At that point, the truck could no longer be operated safely.

Options Considered:

1. **Earlier Replacement**
Earlier replacement would have reduced failure risk but increased near-term capital costs. RSL elected to extend service life in line with prudent asset stewardship and rate mitigation objectives.

2. **Contracting Out All Service and Capital Work**
RSL assessed full outsourcing of line work. This option was rejected due to:

- Higher long-term costs
- Reduced emergency response capability
- Increased restoration times during outages

RSL continues to balance internal crews for base workload with contractors for peak and specialized work.

3. **Truck Rental**
Truck rental was considered but found to be:

- More expensive than ownership over time
- Limited by availability
- Operationally constrained

Rental was used only as a temporary mitigation measure following the asset failure in 2025.

Risk Deferral

The risk of deferral materialized in 2025 when the truck exceeded its viable service life. Structural failure rendered the asset unsafe, necessitating immediate removal from service and the use of rental equipment for the second half of the year.

Going forward, RSL does not plan to operate fleet assets beyond 16 years unless future technology demonstrably supports extended service life.

Outcomes and Benefits

While extending the useful life delayed capital expenditure, the eventual outcome included:

- Unplanned asset failure in 2025
- Temporary reliance on higher-cost rental equipment
- Confirmation of practical service life limits for Altec chassis and booms

Replacement of the truck restores:

- Safe operation
- Reliable emergency response capability
- Reduced reliance on rentals
- Improved fleet resiliency

Project Cost and Timing

The replacement was executed in 2026. Actual purchase costs were impacted by inflationary pressures affecting heavy-duty trucks and specialized utility equipment.

Interim rental and mitigation costs incurred in 2025 in O&M increased the total lifecycle cost of the asset beyond the original forecast.

2022 – 2025 Un-forecasted Material Projects Section

16 - 2022-2025 System Access Projects

Elevated System Access Demand

From 2022 onward, RSL saw a sustained increase in development and load growth activity across its service territory, including residential subdivisions, commercial developments, institutional facilities, and broadband infrastructure. This represented a meaningful increase relative to the prior five-year period.

Under the Distribution System Code, RSL is obligated to respond to system access requests and could not defer customer-driven connections where the customer proceeds with development.

Key System Access Projects

Prescott Arena
Transfer of load from the former arena to the newly constructed Alain Chartrand Community Arena, supporting a modernized municipal facility.

- **2022: $124,703**
- **2023: $50,813**

Westport Subdivision
A net-zero, energy-efficient residential subdivision supporting a walkable community design and regional housing growth.

- **2022: $43,888**
- **2023: $160,897**
- **2024: $525**
- **2025: $16,249**

Bell Fibre to the Home (Prescott, Cardinal, and Morrisburg)
Make-ready and system renewal work to enable fibre deployment, improving broadband access for residents and businesses.

- **2022: $445,684**
- **2023: $178,991**
- **2024: $8,722**

MacEwans Edwards Street
This was to implement EV chargers and providing additional service to a local gas station.

- **2022: $22,486**
- **2023: $44,026**
- **2024: $65,655**

Quality Inn Hotel – Prescott
The first hotel development in Prescott, providing 69 rooms and an indoor pool accessible to the local community.

- **2023: $5,446**
- **2024: $67,629**

Morrisburg Tesla EV
This was implementing a TESLA supercharging station EV charger and providing additional service to a local plaza along the 401 corridors.

- **2024: $22,713**
- **2025: $100,663**

Iroquois – Ferrante Commercial + Apartment
This includes installing the transformer, metering, and connection assets necessary to connect he commercial and apartment building.

- **2024: $22,713**
- **2025: $100,663**

Morrisburg Housing
Providing power to connect housing project geared towards rentals in the Morrisburg area.

- **2024: $11,040**
- **2025: $93,561**

Iroquois Seaway District High School
Service upgrade to support air conditioning installation, including replacement of metering, poles, and installation of a 750 kVA transformer.

- **2025: $119,189**

Morrisburg Campbell Warehouse
Industrial development requiring a 500 kVA transformer and new primary infrastructure to support economic activity in the industrial park.

- **2025: $112,291**

Miscellaneous Service Connections and Renewal Work

Across 2022–2025, RSL completed numerous smaller but collectively material service connections and system renewal activities. While individually modest, these projects are an expected outcome of increased customer activity and aging infrastructure and were managed within approved capital envelopes.

- **2022 - $114.861**
- **2023 - $54,958**
- **2024 - $226,133**
- **2025 - $386,852**

Outcomes and Benefits

- Enabled significant residential, commercial, and institutional growth across the service territory.
- Supported municipal, educational, and community infrastructure investment.
- Improved broadband access through fibre enablement
- Maintained compliance with Distribution System Code obligations.
- Balanced customer-driven growth with prudent system renewal
- Demonstrated flexibility in capital execution while maintaining overall capital discipline.

These projects collectively reflect:

- Customer-driven demand rather than discretionary spending
- Prudent, obligation-based capital execution
- No material deviation from overall capital intent
- A sustained upward trend in system access pressure, informing future capital planning assumptions.

17 - Customer Portal – Silverblaze and Cognos cheque printing

Asset Class: General Plant Location: System-Wide Priority: High (reactive Replacement)		
	Forecasts Costs	**Actual Costs**
2023	$25,000	$66,150
Total	$25,000	$66,150

Project Scope:

The project originally focused on implementing a modern customer information portal to replace the legacy portal previously provided through ITM. The prior portal supported basic billing functionality but lacked features increasingly expected by customers, including:

- Online customer payments
- Detailed usage data and analytics
- Bill comparisons
- Customer rate choice between Time-of-Use and Tiered pricing
- Online move-in and move-out scheduling.

During execution, it was determined that enabling the new customer portal required updates to the bill print functionality, which expanded the original scope.

In parallel, while leveraging third-party IT resources already mobilized for the portal implementation, RSL identified an emerging operational risk related to cheque printing. The existing Cayenta ERP environment was nearing end-of-life for on-site cheque printing. To maintain business continuity, a Cognos-based cheque printing solution was added to the project scope.

Project Driver

Customer Service Modernization
Customers increasingly expect to engage with their utility through secure, self-service digital platforms. The project was driven by the need to improve customer access to billing, usage, and account management tools and to support increased adoption of electronic billing and payments.

Operational Continuity and Risk Mitigation
Separately, the project addressed an impending operational risk associated with cheque printing limitations in the existing Cayenta ERP system. Implementing a Cognos-based cheque printing solution ensured continuity of financial operations until a future ERP replacement.

Efficiency of Execution
Incorporating the cheque printing solution during the portal implementation reduced overall execution risk and avoided the cost and disruption of mobilizing separate third-party resources at a later date.

Options Considered

RSL, in collaboration with CHEC, evaluated multiple customer portal solutions available in the market, including offerings from London Hydro Software and Screaming Power. The selected solution best aligned with RSL's customer service objectives, system integration requirements, and long-term platform strategy.

Risk Deferral

Customer Portal
Deferring the portal implementation would have limited RSL's ability to meet customer expectations for digital service delivery, negatively impacting customer satisfaction and engagement.

Cheque Printing Solution
Deferring the cheque printing upgrade would have created a material risk to RSL's ability to process payments and operate core financial functions within the existing Cayenta environment prior to a full ERP upgrade.

Outcomes and Benefits

- Improved customer access to billing, usage, and account management information
- Significant increase in e-billing adoption, growing by approximately 150%, from 1,800 to 2,700 customers.
- Enhanced customer satisfaction and engagement through digital self-service
- Maintained on-site cheque printing capability and financial operations continuity.
- Reduced operational and business risk during a period of system transition.

Project Cost and Timing

Silverbalze CIS implementation $46,000 Actual project costs of $66,150 exceeded the original $25,000 forecast due to scope expansion identified during implementation. Costs were comprised of:

- SilverBlaze Customer Information System implementation: ~$46,000
- Cognos cheque printing solution for Cayenta: ~$19,600

The additional scope addressed critical customer service functionality and mitigated an emerging operational risk. The decision to include both components within a single project reflected a prudent and cost-effective approach to system renewal and risk management.

18 - Reid Street Cardinal – Replaced the project

Asset Class: General Plant Location: System-Wide Priority: High		
	Forecasts Costs	**Actual Costs**
2023	$0	$80,770
Total	$0	$80,770

Project Scope:

This project involved the replacement of two pole-mounted transformers with a single pad-mounted transformer on Reid Street in Cardinal. The work eliminated aging Pole Tran infrastructure and aligned the site with RSL's current equipment standards.

Project Driver

Safety and Reliability Risk Mitigation
Pole-mounted transformers represent an older design with increased safety risks to line workers and reduced reliability relative to pad-mounted installations. The broader Pole Tran replacement program is intended to mitigate these risks and improve long-term system reliability.

Coordination with Municipal Infrastructure Works
In the original capital plan, priority had been given to replacing Pole Trans located on Kingston Crescent in Prescott. However, the Township of South Dundas advanced road resurfacing and water/sewer works on Reid Street in Cardinal, after which a **five-year road cut moratorium** would apply.

Proceeding with the Reid Street replacement at this time avoided the risk of being unable to complete the work for several years following municipal construction.

Capital Program Optimization
RSL substituted the Kingston Crescent project with the Reid Street project, as both projects delivered equivalent safety and reliability benefits. Adjusting the sequencing of projects allowed RSL to mitigate immediate risk while preserving the overall objectives and timing of the Pole Tran replacement program.

Options Considered

RSL reviewed the remaining Pole-Mounted Transformers across the system to assess relative risk and external constraints. Reid Street was the only location where imminent municipal road and underground infrastructure work would materially restrict RSL's ability to complete the replacement in the near term. No other sites presented the same coordination risk.

Risk Deferral

Deferring the Reid Street replacement would have prevented RSL from replacing the Pole-Mounted Transformers at this location for up to five years due to the anticipated road cut moratorium. This would have increased safety and reliability risk and jeopardized RSL's ability to complete the Pole Tran replacement program within the planned timeline.

Outcomes and Benefits

- Eliminated aging Pole-Mounted Transformer infrastructure on Reid Street
- Reduced safety and reliability risk
- Avoided future road cut restrictions and coordination challenges.
- Maintained momentum and schedule for the overall Pole Tran replacement program.
- Supported completion of remaining Pole Tran replacements by 2027.

Project Cost and Timing

The project was completed in **2024** at a total cost of **$80,770**. Although the project was not individually forecast in the capital plan, it replaced a similarly scoped and budgeted Pole Tran project and did not change the overall program intent or risk profile.

19 - Meter Replacements – Regular residential meter replacement

Asset Class: System Renewal Location: System-Wide Priority: High		
	Forecasts Costs	**Actual Costs**
2022	$30,000	$55,012
2023	$30,000	$42,875
2024	$30,000	$67,393
2025	$30,000	$80,338
Total	**$120,000**	**$245,619**

Project Scope:

This project supports the ongoing replacement of residential electricity meters that have reached end-of-life or require replacement following verification failures. Meter replacements are part of RSL's standard asset management and regulatory compliance program to ensure accurate billing, customer service continuity, and system integrity.

Project Driver

Asset Management and Regulatory Compliance
Meters have defined service lives and verification requirements. Timely replacement is required to maintain compliance with Measurement Canada requirements and ensure accurate revenue measurement.

Supply Chain Risk and Operational Continuity
During the COVID-19 pandemic, meter procurement lead times increased significantly. To mitigate the risk of meter shortages and service disruption, RSL advanced procurement volumes beyond historical annual levels.

Customer Growth
Higher-than-forecast residential growth, particularly associated with the Westport Watercolours development, increased the number of meters required during the year.

Cost Escalation
Unit pricing for meters increased relative to forecast assumptions, reflecting broader supply chain and inflationary pressures experienced during the period.

Options Considered

Alternative metering technologies were considered; however, RSL's Advanced Metering Infrastructure (AMI) is standardized on Elster meters. Transitioning to a different platform would have required material additional capital investment and system integration costs and was not considered cost-effective or prudent.

Risk Deferral

Deferring or limiting meter procurement would have increased the risk of insufficient spare inventory to replace failed or non-compliant meters. This could have resulted in service delays, billing inaccuracies, and regulatory non-compliance. Advancing procurement reduced operational risk during a period of heightened supply chain uncertainty.

Outcomes and Benefits

- Maintained continuity of meter replacement activities during the pandemic.
- Ensured sufficient inventory to support residential growth.
- Reduced operational and compliance risk associated with meter failures.
- Preserved billing accuracy and customer service standards.

Project Cost and Timing

Actual project costs of $55,012, $67,393, and $80,338 in 2022, 2023, and 2025 respectively exceeded the original $30,000 forecast due to a combination of increased procurement volumes, higher unit costs, and growth-related demand. The variance reflects a prudent operational response to supply chain risk and customer growth rather than a change in project scope.

2026 Material Projects Section

Year	Category	Project Name	Budget
2026	System Access	Iroquois MS2	$950,000
2026	System Access	Valecraft Merkley Oaks Homes 1	$505,989
2026	System Access	Valecraft Merkley Oaks Apartments	$264,635
2026	System Access	Landark Watercolours Development	$231,304
2026	System Access	Prescott Grocery Store Ros-bay	$91,656
2026	System Access	Prescott Long Term Care	$299,992
2026	System Renewal	Prescott Fort Town Dr – Pole Trans	$104,953
2026	System Renewal	Prescott Kingston Cr Pole Trans	$200,033
2026	System Renewal	Morrisburg Plaza Kiosks	$259,898
2026	System Renewal	Iroquois MS1 Replace Air Brake Switch	$100,000
2026	System Service	Cardinal Transformer + Fan Capacity	$450,000
2026	System Service	NRCAN – Iroquois Reclosures and SCADA Switches	$320,000
2026	General Plant	Vehicle - Single Bucket Replacement	$493,910
2026	General Plant	Vehicle - Double Bucket Replacement	$641,718
2026	General Plant	Vehicle – Trouble Call Pick-up Replacement	$90,000

20 - Iroquois MS2 Project (WIP)

Asset Class: Station	**Safety:**	**6**
Classification: System Access	**Environmental Benefits:**	**4**
Priority: High	**Efficiency, Customer Value,**	**20**
Location: Iroquois	**Reliability:**	**4**
Project Year: 2026	**Coordination, Interoperability:**	**16**
Forecast Cost: $950,000	**Economic Development:**	**2**
	Cyber Security:	**52**
	Total Score:	

Project Scope:

This project involves the acquisition of land and construction of a second distribution station (MS2) in Iroquois to provide sufficient capacity and resiliency to meet current and forecasted load growth.

The Iroquois service area has experienced sustained growth in both residential and commercial demand. As of 2025, the existing station was operating at approximately 95% of peak capacity on peak demand days. Planned development—including four phases of residential and apartment construction at the Valecraft Merkley Oaks subdivision—would exceed the remaining available capacity of the existing station.
The new station will provide additional supply capacity and enable continued community growth while improving system reliability and operational flexibility.

Project Driver:

Load Growth and System Capacity

Ongoing residential and commercial development in Iroquois has driven load growth beyond the practical limits of the existing station. Without additional capacity, RSL would be unable to accommodate new customer connections, directly constraining housing and economic development in the community.

System Resiliency and Reliability

A second distribution station significantly improves system resiliency by:

- Providing redundant supply to the community
- Enabling planned maintenance without extended outages
- Reducing exposure to single-point-of-failure risk

Loss of the existing station without redundancy would result in a prolonged outage affecting the entire community.

Options Considered

1. **Delay the Project**
   Deferral was considered but determined not to be viable due to imminent development timelines and the need to connect new residential units.

2. **Increase the Size of the Existing Station Transformer**
   Upsizing the existing transformer would address near-term capacity constraints but would **not provide resiliency** or mitigate single-station risk. This option was therefore rejected.

3. **Non-Wires Solutions**
   non-wires alternatives were assessed but determined not to be feasible. With the exception of Westport and Prescott, RSL service territories are supplied from thermally constrained Hydro One transmission stations. Additional injection would introduce voltage quality concerns and operational risk.

4. **Replacing transformer:** Previous project to update the MS1 backup transformer would maintain status quo on the load and would not have all the full resiliency and maintenance without extended outages.

Construction of a second distribution station was identified as the only viable long-term solution to meet capacity, reliability, and safety requirements.

Risk Deferral

Deferral of this project would prevent the connection of new residential and commercial developments, directly impacting housing delivery and economic growth in Iroquois. Given current loading levels and confirmed development commitments, deferral is not feasible without materially constraining customer connections.

Outcomes and Benefits

The project will deliver the following benefits:

- Enable connection of new residential and commercial customers.
- Support planned housing development at Merkley Oaks
- Improve system resiliency through station redundancy.
- Reduce outage risk and improve maintenance flexibility.
- Provide long-term capacity aligned with community growth.

Project Cost and Timing: 2026 in service

The project is planned to be in service in 2026. Costs reflect current market pricing for station transformers, construction activities, and land acquisition. Early land acquisition and station development will position RSL to meet confirmed development demand without service delays.

21 - Valecraft Merkley Oaks Homes P1 – System Access (WIP)

Asset Class: Underground **Classification: System Access** **Priority: High** **Location: Iroquois** **Project Year: 2026** **Forecast Cost: $505,989**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**6** **4** **5** **8** **16** **2** **41**

Project Scope

This project supports the development of a new residential subdivision in Iroquois with a fully underground electrical design. The scope includes:

- Installation of underground primary distribution infrastructure
- Civil works associated with the subdivision build
- Pulling and terminating primary cable
- Providing electrical service to new residential homes

Project Driver

This project is driven by the development of a new subdivision and the need to connect the developer and new residential customers to the distribution system to support community growth.

Options Considered

RSL worked collaboratively with the developer to modify the original subdivision phasing plan. The initial proposal consisted of two phases (homes and apartments). This was revised to four phases—two phases for homes and two phases for apartments—to better align infrastructure investments with the developer's construction schedule and reduce upfront system impacts.

Risk deferral

Deferring this project would delay residential development in Iroquois and restrict housing growth needed to support the community and local economic development.

Outcomes Benefits

- Enables new housing supply within the community.
- Supports municipal growth and residential intensification objectives.
- Aligns distribution infrastructure investment with planned development.
- Ensures timely and cost-effective service connections for new customers.

Cost and Timing

The project is planned to be placed in service in 2026, with a total forecast capital cost of **$505, 989**.

22 - Valecraft - Merkley Oaks - Apartments Phase 1 – System Access (WIP)

Asset Class: Underground **Classification: System Access** **Priority: High** **Location: Iroquois** **Project Year: 2026-2027** **Forecast Cost: $322,647**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**6** **4** **5** **8** **16** **2** **41**

Project Scope

This project supports the development of a new residential apartments geared for rentals in Iroquois with a fully underground electrical design. The scope includes:

- Installation of underground primary distribution infrastructure
- Civil works associated with the subdivision build
- Pulling and terminating primary cable
- Providing electrical service to new residential homes

Project Driver

This project is driven by the development of a new subdivision and the need to connect the developer and new residential customers to the distribution system to support community growth.

Options Considered

RSL worked collaboratively with the developer to modify the original subdivision phasing plan. The initial proposal consisted of two phases (homes and apartments). This was revised to four phases—two phases for homes and two phases for apartments—to better align infrastructure investments with the developer's construction schedule and reduce upfront system impacts.

Risk deferral

Deferring this project would delay residential development in Iroquois and restrict housing growth needed to support the community and local economic development.

Outcomes Benefits

- Enables new housing supply within the community.
- Supports municipal growth and residential intensification objectives.
- Aligns distribution infrastructure investment with planned development.
- Ensures timely and cost-effective service connections for new customers.

Cost and Timing

Year	Location	Scope	Cost
2026	Iroquois	Merkley Oaks Apartments Phase 1	$264, 635
2027	Iroquois	Merkley Oaks Apartments Phase 1	$58,012

23 - Landark - Watercolours - Development Phase 3 – System Access (WIP)

Asset Class: Underground **Classification: System Access** **Priority: High** **Location: Westport** **Project Year: 2026** **Forecast Cost: $231,304**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**6** **4** **5** **8** **16** **2** **41**

Project Scope

This project supports the development of a 60 new residential homes in Westport Ontario with a fully underground electrical design. The scope includes:

- Installation of underground primary distribution infrastructure
- Civil works associated with the subdivision build
- Pulling and terminating primary cable
- Providing electrical service to new residential homes

Project Driver

This project is driven by the development of a new subdivision and the need to connect the developer and new residential customers to the distribution system to support community growth.

Options Considered

RSL continues to work collaboratively with the developer to develop homes for the Westport community. This is the 3rd phase of this development.

Risk deferral

Deferring this project would delay residential development in Iroquois and restrict housing growth needed to support the community and local economic development.

Outcomes Benefits

- Enables new housing supply within the community.
- Supports municipal growth and residential intensification objectives.
- Aligns distribution infrastructure investment with planned development.
- Ensures timely and cost-effective service connections for new customers.

Project Cost and Timing

The project is planned to be placed in service in 2026, with a total forecast capital cost of $231,304.

24 - Prescott Grocery Store - System Access (WIP)

Asset Class: Overhead		**Safety:**	**12**
Classification: System Access		**Environmental Benefits:**	**4**
Priority: High		**Efficiency, Customer Value,**	**20**
Location: Prescott		**Reliability:**	**4**
Project Year: 2026		**Coordination, Interoperability:**	**16**
Forecast Cost: $91,656		**Economic Development:**	**2**
		Cyber Security:	**58**
		Total Score:	

Scope:

This project provides new electrical system access to a proposed grocery store in Prescott. The work includes the installation of three new poles and approximately 100 metres of three-phase primary and secondary conductors. The new grocery store will replace a former hardware store building that has been out of operation for several years.

Project Driver

- Provide system access to support a new grocery store development.
- Enable redevelopment of an underutilized commercial property.
- Support essential services and community needs.

Options Considered

Two routing options were evaluated for supplying electrical service to the site:
- **Option 1:** Connection using existing infrastructure via the Churchill pole line.
- **Option 2:** Connection via the Irvine corridor

Following evaluation, the Irvine routing was selected as it represented the most cost-effective and practical solution while meeting system requirements.

The options considered were brining the feed through a Churchill poline or bringing it in through Irvine. Ultimately Irvine was the more cost-effective option.

Risk Deferral,

System access requests are not deferred, as deferral would prevent the customer from proceeding with development and delay the provision of essential services to the community.

Outcomes Benefits,

- Enables the development of a new grocery store in Prescott.
- Improves access to essential food services for the local community.
- Supports economic development and revitalization of an existing commercial site.

Project Cost and Timing

The project is planned to be placed in service in 2026, with a total forecast capital cost of $91,656.

25 - Prescott Long Term Care - System Access (WIP)

Asset Class: Overhead	**Safety:**	**6**
Classification: System Access	**Environmental Benefits:**	**8**
Priority: High	**Efficiency, Customer Value,**	**20**
Location: Prescott	**Reliability:**	**12**
Project Year: 2026	**Coordination, Interoperability:**	**16**
Forecast Cost: $299,992	**Economic Development:**	**2**
	Cyber Security:	**64**
	Total Score:	

Scope:

Prescott Long-Term Care is constructing a new long-term care facility on its existing property to increase resident capacity. The project involves building a new facility, transferring residents to the new building, and subsequently decommissioning the existing structure.

Project Driver

- Provide increased electrical capacity to support the expanded long-term care facility.
- Enable reliable, compliant electrical service to meet current and future operational requirements.
- Support broader system capacity improvements in the Prescott Industrial Park area.

Options Considered

Initial Assessment

Prior to receiving final load requirements, RSL evaluated connecting the facility through the existing RSL distribution 2.4kV station. Once the full electrical load was communicated, it was determined that a direct connection to RSL's 44 kV feeder was the most efficient and effective solution.

Option 1 – Hydro One Poles along Edward Street
- Construction of a feeder on Hydro One poles.
- Required attachment to approximately 12 poles.
- **Rejected** due to Hydro One being unable to meet project timelines and estimated costs being >$600,000 in costs.

Option 2 – Street-Based Routing
- Evaluated routing from the street network.
- **Rejected** as it did not provide the added benefit of extending 44 kV service into the Industrial Park

Option 3 – Churchill → Industrial → Irvine → Edward (Selected Option)
- Required upgrades to approximately 20 existing poles.
- Most cost-effective option
- Provides long-term benefit by extending 44 kV capacity into the Prescott Industrial Park, supporting future industrial growth.

Risk deferral

Deferring this project would prevent the Prescott Long-Term Care facility from proceeding with its expansion, limiting the availability of additional long-term care spaces for residents in the community.

Outcomes and Benefits

- Enables expansion of long-term care capacity in Prescott.
- Supports local employment and economic activity.
- Improves access to care for residents.
- Provides long-term electrical capacity benefits for the Prescott Industrial Park and future development.

Project Cost and Timing

The project is planned to be placed in service in 2026, with a total forecast capital cost of $299,992.

26 - Prescott Pole Trans – System Renewal (Not Started)

Asset Class:	**Underground**	**Safety:**	**18**
Classification:	**System Renewal**	**Environmental Benefits:**	**8**
Priority:	**High**	**Efficiency, Customer Value,**	**20**
Location:	**Prescott**	**Reliability:**	**4**
Project Year:	**2026**	**Coordination, Interoperability:**	**4**
Forecast Cost:	**$304,987**	**Economic Development:**	**2**
		Cyber Security:	**56**
		Total Score:	

Project Scope:

This project will replace eight (8) pole-mounted "Pole Tran" transformers located on Kingston Crescent and Fort Town Road in Prescott with pad-mounted transformers of equivalent capacity.

As part of the project, RSL will complete a detailed loading and capacity study to appropriately size each replacement transformer and ensure sufficient capacity to meet both current load and anticipated future customer demand.

The work will include removal of the existing Pole Tran units, installation of pad-mounted transformers, and associated underground civil and electrical work.

Project Driver:

Safety

Pole Tran transformers represent an older design in which the transformer is housed inside a streetlight pole. Due to limited internal space and restricted access, this design presents elevated safety risks for line workers during maintenance and fault response activities and no longer aligns with RSL's current equipment standards.

Replacement components for Pole Tran units are also no longer readily available, further increasing operational and safety risks.

Replacing these assets with pad-mounted transformers will eliminate these hazards and ensure compliance with Ontario Regulation 22/04. All work will be inspected by RSL staff and approved prior to energization.

Efficiency, Customer Value, and Reliability

The aging Pole Tran infrastructure introduces increasing reliability risk. While failures would likely result in localized outages, the lack of spare parts could significantly extend restoration times.

Replacing the Pole Trans with pad-mounted transformers will:

- Improve maintainability and access for crews.
- Reduce outage duration and restoration complexity.
- Enhance overall system reliability and asset standardization.

Options Considered:

The primary option considered was timing of the replacements. These projects had been deferred in earlier years due to internal resource constraints.

An overhead replacement option was reviewed but deemed not viable, as the area is already constructed as an underground system. Maintaining underground infrastructure is also required to remain consistent with municipal standards and expectations.

Risk Deferral

Deferring this project would maintain existing safety risks associated with Pole Tran equipment and continue exposure to reliability risks stemming from aging assets and limited spare parts availability. While manageable in the short term, these risks increase as the equipment continues to age and failure likelihood rises.

Outcomes and Benefits

- Eliminates known safety risks to line workers.
- Replaces obsolete equipment with standardized assets.
- Improves reliability and reduces outage duration.
- Aligns infrastructure with municipal underground standards.
- Supports long-term asset sustainability and customer service.

Project Cost and Timing

Year	Location	Scope	Cost
2026	Prescott – Kington Cr	Replace Pole Trans – 5 units	$200,034
2026	Prescott – Fort Town Dr.	Replace Pole Trans – 3 units	$104,953

27 - Morrisburg Plaza Kiosks – System Renewal (Not Started)

Asset Class:	**Underground**	**Safety:**	**24**
Classification:	**System Renewal**	**Environmental Benefits:**	**8**
Priority:	**High**	**Efficiency, Customer Value,**	**10**
Location:	**Morrisburg**	**Reliability:**	**8**
Project Year:	**2026**	**Coordination, Interoperability:**	**4**
Forecast Cost:	**$259,898**	**Economic Development:**	**2**
		Cyber Security:	**56**
		Total Score:	

Project Scope

This project involves the replacement of aging and non-standard transformer kiosks at the Morrisburg Plaza. The scope includes:

- Replacement of existing transformer kiosks
- Conversion of three existing transformers to pad-mounted configurations
- Installation of associated riser poles and related underground connections

Project Driver

- Safety concerns associated with aging kiosk infrastructure
- Reliability risks due to equipment condition.
- The need to address infrastructure that no longer meets current standards.

Options Considerations

1. Replace with three new transformers in kiosk configurations – This option would partially renew the infrastructure but would not adequately address safety concerns or fully meet current ESA and CSA standards.
2. Convert to pad-mounted transformers (preferred option) – This option improves safety, enhances reliability, and ensures compliance with applicable standards.

Risk deferral

Deferring this project would:

- Increase safety risks to the public and workers.
- Increase the likelihood of equipment failure and unplanned outages.
- Prolong reliance on aging, non-compliant infrastructure.

Outcomes Benefits

- Improved public and worker safety
- Enhanced system reliability
- Compliance with current ESA and CSA standards
- Reduced operational and maintenance risk.

Cost and Timing

The project is planned to be placed in service in 2026, with a total forecast capital cost of $259,898.

28 - Iroquois MS1 Replace Air Break Switch (Not Started)

Asset Class: Station	**Safety:**	**6**
Classification: System Renewal	**Environmental Benefits:**	**4**
Priority: High	**Efficiency, Customer Value,**	**20**
Location: Iroquois	**Reliability:**	**4**
Project Year: 2026	**Coordination, Interoperability:**	**4**
Forecast Cost: $100,000	**Economic Development:**	**2**
	Cyber Security:	**40**
	Total Score:	

Project Scope

This project involves the replacement of an obsolete 44 kV air break switch at Iroquois MS1. The air break switches currently used within RSL's system are becoming increasingly difficult to source and support due to obsolescence.

The project forms part of a systematic and sequential replacement strategy, whereby:

- Obsolete air break switches are replaced with current-standard equipment.
- Removed air breaks that remain serviceable are retained as in-house spares.
- RSL gradually transitions away from obsolete equipment without unnecessary capital concentration.

Project Driver

Obsolescence and Maintainability

The primary driver for this project is equipment obsolescence. Existing air break switches are no longer readily available from manufacturers, increasing the risk of extended outages should a failure occur.

Maintaining obsolete equipment also limits RSL's ability to safely and efficiently isolate portions of the 44 kV system during maintenance or fault conditions.

Options Considerations

1. Sourcing second-hand air break switches
   This option was evaluated but rejected due to uncertain condition, limited availability, and ongoing exposure to obsolescence risk.

2. Full system replacement of all air break switches
   Replacing all air breaks simultaneously was considered but determined to be imprudent from a capital management perspective.

3. Phased replacement approach (selected option)
   RSL elected to replace air break switches incrementally, prioritizing the highest-risk locations. This approach allows:

- Controlled capital deployment
- Continued availability of removed equipment as spares
- A managed transition to modern, supportable equipment

Risk deferral

Deferring replacement of this air break switch increases the risk of extended outages, particularly where isolations require coordination with Hydro One. Failure of an obsolete switch could significantly prolong restoration time due to limited replacement options and operational constraints.

Outcomes Benefits

Completion of this project will result in:

- Removal of obsolete switching equipment
- Improved system reliability and maintainability
- Reduced outage duration risk
- Improved operational flexibility during maintenance and emergency conditions.
- Progress toward full transition to non-obsolete station equipment

Cost and Timing

The project is planned for execution in 2026, with an estimated cost of $100,000, inclusive of material and labour. The project aligns with RSL's broader strategy of phased system renewal while maintaining operational resilience.

29 - Cardinal Transformer + Cooling Fan Capacity (WIP)

Asset Class: Station	**Safety:**	**18**
Classification: System Renewal	**Environmental Benefits:**	**12**
Priority: High	**Efficiency, Customer Value,**	**20**
Location: Cardinal	**Reliability:**	**4**
Project Year: 2026	**Coordination, Interoperability:**	**12**
Forecast Cost: $450,000	**Economic Development:**	**2**
	Cyber Security:	**68**
	Total Score:	

Project Scope:

This project involves the replacement of the existing station transformer at Cardinal MS1 and the addition of a forced-air cooling fan to the replacement unit. The cooling fan increases the transformer's short-term and peak load capability, enabling the entire Cardinal service area to be supplied from a single station during contingency events.

This configuration improves system reliability and hardening, particularly in scenarios involving outages or maintenance activities affecting the alternate station.

Project Driver:

Asset Condition and Age

The existing Cardinal MS1 transformer has been energized since June 1953 and is the oldest station transformer in the RSL fleet. The transformer has reached the end of its service life.

Independent third-party asset condition assessments conducted in 2025 identified both Cardinal station transformers as medium-to-high priority for replacement, confirming elevated risk of failure if left in service.

Reliability and System Resilience

In addition to asset condition, RSL identified a need to ensure that Cardinal's full load can be supplied from a single station during abnormal or emergency conditions. Adding a cooling fan to the replacement transformer provides a cost-effective increase in usable capacity, allowing Cardinal to remain supplied even during peak loading conditions.

This approach enhances reliability without the need for a significantly larger transformer.

Options Considered:

Like-for-like transformer replacement (no fan)
A straight replacement was evaluated; however, this option did not provide sufficient contingency capacity to carry the full Cardinal load under peak conditions.

Transformer replacement with cooling fan (preferred option)
Adding a cooling fan at an incremental cost of approximately $30,000 provides an estimated 33% increase in available capacity, representing a highly cost-effective reliability improvement.

Upsizing to a 5 MVA transformer
This option was reviewed but not justified, as long-term load growth in Cardinal does not warrant the additional capital cost associated with a larger transformer.

Non-wires alternatives (NWA)
non-wires solutions were evaluated and determined to be impractical. With the exception of Westport and Prescott, RSL's service territory is supplied from thermally constrained Hydro One transmission stations. Additional distributed injection or storage would create power quality and operational challenges.

Conservation alternatives
Significant conservation and demand management (CDM) initiatives were completed more than five years ago. While future conservation will continue through enhanced DSM (eDSM) programs, conservation alone is insufficient to offset the need for transformer replacement and contingency capacity.

Risk Deferral

Deferring this project would materially increase the risk of transformer failure at the oldest station in RSL's system. A failure could result in **extended outages and significant customer impact** due to the critical role of this station in supplying the Cardinal community.

Outcomes and Benefits

Key outcomes and benefits of the project include:

- Replacement of end-of-life station infrastructure
- Reduced risk of catastrophic transformer failure
- Improved system resilience and reliability
- Ability to supply the full Cardinal load from a single station during contingencies.
- Cost-effective capacity increase without oversizing assets
- Support for future load growth driven by electrification.

Project Cost and Timing: 2026 in service

The project is planned for execution in 2026 with a forecast cost of $450,000. The scope reflects a balanced approach that addresses asset condition, reliability, and future system needs while minimizing unnecessary capital expenditure.

30 - NRCAN – Iroquois Reclosers and SCADA Switches (Not Started)

Asset Class: Station **Classification: System Service** **Priority: High** **Location: Iroquois** **Project Year: 2026-2030** **Forecast Cost: $2,685,156 ($1,342,578 contribution from NRCAN)**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**6** **4** **20** **4** **4** **2** **40**

Project Scope:

RSL is advancing a multi-year distribution automation and SCADA enablement program, beginning in Iroquois, and expanding across the system. Historically, RSL has relied primarily on fuses for feeder protection and does not currently operate SCADA-capable switching devices.

This project introduces:

- SCADA-compatible reclosers and switches at strategic locations
- System hardening through automated fault isolation.
- The foundation for full SCADA system implementation

Reclosers will significantly reduce fuse operations, improve outage diagnostics, and enable faster restoration. While originally planned as a 10-year rollout, RSL received conditional approval in 2025 for NRCan matching grant funding, allowing the implementation timeline to be cut in half.

Project Driver:

Reliability and System Hardening

Reclosers and SCADA-enabled switches are proven, industry-standard technologies that:

- Automatically isolate faults
- Reduce sustained outages.
- Minimize customer interruptions caused by transient faults.
- Improve system sectionalization.

Faster Outage Recovery and Operational Efficiency

SCADA capability enables:

- Remote monitoring and switching
- Faster troubleshooting and restoration
- Reduced truck rolls and restoration costs
- Improved situational awareness during outages.

Funding Opportunity and Cost Effectiveness

The NRCan matching grant materially improves project economics. Proceeding now avoids higher future costs and captures federal funding that would otherwise be lost.

Options Considered

1. **Delay the Project**
   Deferral was considered but rejected due to:
   - Continued reliability limitations
   - Loss of NRCan grant funding.
   - Higher long-term costs
2. **Install Reclosers Without SCADA**
   While reclosers alone would provide some benefit, the absence of SCADA would materially limit restoration speed, analytics, and system visibility. The incremental cost of SCADA capability provides disproportionate operational benefit.

The selected approach—**SCADA-enabled reclosers**—was determined to be the most cost-effective and future-proof solution.

Risk Deferral

Deferring this project would:

- Delay RSL's reliability improvement strategy.
- Increase outage duration and restoration costs.
- Result in forfeiture of NRCan grant funding.
- Increase total lifecycle costs due to inflation and retrofits.

Outcome and Benefits

The program will deliver:

- Reduced outage frequency and duration
- Faster fault isolation and service restoration
- Improved system resilience and reliability
- Lower long-term operating and restoration costs
- A scalable foundation for advanced distribution automation

Project Cost and Timing:

Year	Location	Scope	Cost
2026	Iroquois	4 - SCADA compatible Reclosers & Switches	$320,000
2027	Cardinal MS1& 2	4 - SCADA compatible Reclosers & Switches	$480,000
2027	Prescott MS2	2 – SCADA compatible Reclosers & Switches	$160,000
2027	Prescott MS3	4 – SCADA Compatible Reclosers & Switches	$320,000
2028	Prescott MS1	3 - SCADA compatible Reclosers & Switches	$300,000
2028	Prescott MS4	2 – SCADA Compatible Reclosers & Switches	$160,000

2029	Morrisburg MS1&2	6 – SCADA Compatible Reclosers & Switches	$480,000
2030	All areas	SCADA implementation	$465,156

This project represents a step-change in RSL's reliability, operational capability, and system resilience. Leveraging NRCan funding allows RSL to accelerate modernization, reduce customer impacts from outages, and implement proven technology at half the net cost to ratepayers.

31 - Vehicle – Altec Single Bucket Service Truck Replacement (2010 Unit) Replace Single Bucket (Complete) (Same as 15)

Asset Class: Fleet Vehicle	**Safety:**	**24**
Classification: Renewal	**Environmental Benefits:**	**8**
Priority: High	**Efficiency, Customer Value,**	**20**
Location: All	**Reliability:**	**16**
Project Year: 2026	**Coordination, Interoperability:**	**16**
Forecast Cost: $439,910	**Economic Development:**	**2**
	Cyber Security:	**86**
	Total Score:	

This was written up previously above in the 2022-2026 reconciliation

32 - Vehicle – Replace POSI Double Bucket Service Truck Replacement (2011 Unit) Replace Single Bucket (Complete)

Asset Class: Fleet Vehicle **Classification: Renewal** **Priority: High** **Location: All** **Project Year: 2026** **Forecast Cost: $641,718**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**24** **8** **20** **16** **16** **2** **86**

Project Scope:

This project replaced a 2011 POSI double-bucket service truck, which had reached 15 years of service. RSL operates a fleet of three large service trucks:

- One single-bucket truck
- One double-bucket truck
- One digger derrick

These trucks are critical assets used for emergency response, planned maintenance, and capital construction activities.

RSL has historically utilized fleet assets through their full useful life—and beyond where feasible—to minimize rate impacts. Proactive corrosion control measures, including regular oil spraying, were used to extend service life.

Project Driver:

Fleet Reliability and Operational Readiness

Service trucks are mission-critical assets. Continued reliability is required to maintain acceptable response times for outages, safety events, and customer service work. While service life extension was pursued to reduce capital pressure, the age of the truck ultimately exceeded safe operating limits in the single bucket at 15 years. The impact of losing the single bucket truck early without a viable rental market has changed the approach slightly. RSL continues to utilize the service trucks to the full-service life to minimize costs but has learned that pushing beyond that both pushing beyond the service life and pulling up the service life increases costs for the customers. RSL ongoing will aim to optimize service life for reliability as well as lowest cost option to the customers.

Options Considered:

1. **Earlier Replacement**
Earlier replacement would have reduced failure risk but increased near-term capital costs. RSL

elected to extend service life in line with prudent asset stewardship and rate mitigation objectives.

2. **Contracting Out All Service and Capital Work**
RSL assessed full outsourcing of line work. This option was rejected due to:

- Higher long-term costs
- Reduced emergency response capability
- Increased restoration times during outages

RSL continues to balance internal crews for base workload with contractors for peak and specialized work.

3. **Truck Rental**
Truck rental was considered but found to be:

- More expensive than ownership over time
- Limited by availability
- Operationally constrained

Rental was used only as a temporary mitigation measure following the asset failure in 2025.

Risk Deferral

The risk of deferral would put the truck at risk of failure without a backup. The rental market does not have service trucks available for the utility.

RSL does not plan to operate fleet assets beyond 15 years unless future technology demonstrably supports extended service life.

Outcomes and Benefits

- Safe operation
- Reliable emergency response capability
- Reduced reliance on rentals
- Reduced reliance on contractors
- Improved fleet resiliency

Project Cost and Timing

The replacement was executed in 2025 with delivery in 2026.

Year	Scope	Cost
2025	Tandem Axle Cab and Chassis	$148,000
2026	Fibreglass Utility Line Body	$493,718

33 - Vehicle – Trouble Call Vehicle Replacement (Not Started)

Asset Class: Fleet **Classification: General Plant** **Priority: Medium**	**Location: All Service Areas** **Project Year: 2026** **Forecast Cost: $90,000**

Asset Class: Fleet Vehicle **Classification: Renewal** **Priority: Medium** **Location: Prescott** **Project Year: 2026** **Forecast Cost: $90,000**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**18** **8** **10** **12** **8** **2** **58**

Project Scope:

This project involves the replacement of a 2015 GMC Sierra pickup truck with 274,546 km, which has reached the end of its reliable service life. Recent mechanical inspections identified metal shavings in the engine, indicating internal deterioration and a high likelihood of imminent failure. Continued operation is no longer economical or reliable.

RSL maintains a fleet of three (3) pickup trucks, each assigned to critical operational roles:

- Operations Manager – customer- and developer-facing role
- Foreman / Lead Hand – capable of towing reel trailers
- Trouble Call Vehicle – used for emergency response.

The trouble call vehicle is essential to meeting RSL's two-hour emergency response requirement.

RSL employs a pass-down fleet strategy to optimize cost, reliability, and asset utilization. Because the Operations Manager and Trouble Call vehicles have identical specifications, the new replacement vehicle will be assigned to the Operations Manager, ensuring a professional appearance when meeting with customers and developers.

The 2021 Dodge Ram with 153,197 km, currently assigned to the Operations Manager, will be reassigned as the Trouble Call vehicle, replacing the failing 2015 GMC Sierra.

Project Driver:

The primary driver for this project is the vehicle reaching the end of its reliable useful life, with confirmed internal engine deterioration significantly increasing the risk of:

- Sudden mechanical failure
- Unplanned service interruptions
- Escalating repair and rental costs

Options Considered:

1. Alternative Vehicle Types

Other vehicle types were evaluated. SUVs were determined to be not suitable, as they do not provide sufficient payload capacity, towing capability, or equipment storage required for emergency response and field operations.

2. Longer or Shorter Replacement Cycles

RSL aims to balance reliability, cost control, and operational readiness. Service vehicles are typically replaced after 8–10 years or approximately 200,000 km, which optimizes lifecycle cost and minimizes failure risk.

Where vehicles are inspected and confirmed to be in good mechanical condition, service life extensions are utilized to defer capital expenditures. The current vehicle condition does not support further extension.

The pass-down strategy:

- Keeps customer-facing vehicles in the best condition.
- Balances mileage across the fleet
- Maximizes fleet value without compromising reliability.

3. Vehicle Leasing or Rentals

Vehicle leasing and long-term rentals were considered but found to be more costly than ownership due to the high annual mileage associated with RSL's geographically dispersed service territory.

Rental vehicles were used only as a temporary mitigation measure following the asset failure in 2025.

Risk Deferral

Deferring this replacement would expose RSL to a high risk of engine failure, potentially resulting in:

- Significant unplanned repair expenses
- Loss of emergency response capability
- Increased reliance on rental vehicles or external contractors

Outcomes and Benefits

- Maintains safe and reliable fleet operations.
- Ensures continued emergency response capability.
- Reduces reliance on rental vehicles.
- Reduces reliance on external contractors for trouble calls.

- Improves fleet resiliency and lifecycle management.

Project Cost and Timing

In service year of 2026 estimated at $90,000.

2027 Material Projects Section

Year	Category	Project Name	Budget
2027	System Access	Valecraft Merkley Oaks Homes 2	$120,493
2027	System Access	Valecraft Merkely Oaks Apartments	$58,012
2027	System Access	Cardinal Dundas Street Rebuild – Bridge to Hwy 2	$128,525
2027	System Renewal	Meter Replacements Inc PME	$274,700
2027	System Renewal	Iroquois Plaza Kiosks	$259,898
2027	System Service	Cardinal Feeder Load Balancing	$119,229
2027	System Service	NRCAN – Cardinal Reclosures, Structure, and SCADA Switches	480,000
2027	System Service	NRCAN – Prescott MS2 Reclosures and SCADA switches	160,000
2027	System Service	NRCAN – Prescott MS3 Reclosures and SCADA switches	320,000

34 - Valecraft Merkley Oaks Homes P2 – System Access

Asset Class: Underground **Classification: System Access** **Priority: High** **Location: Iroquois** **Project Year: 2027-2029** **Forecast Cost: $621,377**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**6** **4** **5** **8** **16** **2** **41**

Project Scope

This project supports the development of a new residential subdivision in Iroquois with a fully underground electrical design. The scope includes:

- Installation of underground primary distribution infrastructure
- Civil works associated with the subdivision build
- Pulling and terminating primary cable
- Providing electrical service to new residential homes

Project Driver

This project is driven by the development of a new subdivision and the need to connect the developer and new residential customers to the distribution system to support community growth.

Options Considered

RSL worked collaboratively with the developer to modify the original subdivision phasing plan. The initial proposal consisted of two phases (homes and apartments). This was revised to four phases—two phases for homes and two phases for apartments—to better align infrastructure investments with the developer's construction schedule and reduce upfront system impacts.

Risk deferral

Deferring this project would delay residential development in Iroquois and restrict housing growth needed to support the community and local economic development.

Outcomes Benefits

- Enables new housing supply within the community.
- Supports municipal growth and residential intensification objectives.
- Aligns distribution infrastructure investment with planned development.
- Ensures timely and cost-effective service connections for new customers.

Cost and Timing

Year	Location	Scope	Cost
2027	Iroquois	Merkley Oaks Homes Phase 2	$120,493
2028	Iroquois	Merkley Oaks Homes Phase 2	$240,986
2029	Iroquois	Merkley Oaks Homes Phase 2	$120,493

35 - Valecraft - Merkley Oaks - Apartments Phase 1 – System Access (same as 22)

Asset Class: Underground **Classification: System Access** **Priority: High** **Location: Iroquois** **Project Year: 2026-2027** **Forecast Cost: $217,913**			
	Safety:	**6**	
	Environmental Benefits:	**4**	
	Efficiency, Customer Value,	**5**	
	Reliability:	**8**	
	Coordination, Interoperability:	**16**	
	Economic Development:	**2**	
	Cyber Security:	**41**	
	Total Score:		

Project Scope

This project supports the development of a new residential apartments geared for rentals in Iroquois with a fully underground electrical design. The scope includes:

- Installation of underground primary distribution infrastructure
- Civil works associated with the subdivision build
- Pulling and terminating primary cable
- Providing electrical service to new residential homes

Project Driver

This project is driven by the development of a new subdivision and the need to connect the developer and new residential customers to the distribution system to support community growth.

Options Considered

RSL worked collaboratively with the developer to modify the original subdivision phasing plan. The initial proposal consisted of two phases (homes and apartments). This was revised to four phases—two phases for homes and two phases for apartments—to better align infrastructure investments with the developer's construction schedule and reduce upfront system impacts.

Risk deferral

Deferring this project would delay residential development in Iroquois and restrict housing growth needed to support the community and local economic development.

Outcomes Benefits

- Enables new housing supply within the community.
- Supports municipal growth and residential intensification objectives.
- Aligns distribution infrastructure investment with planned development.
- Ensures timely and cost-effective service connections for new customers.

Cost and Timing

Year	Location	Scope	Cost
2026	Iroquois	Merkley Oaks Apartments Phase 1	$159,901
2027	Iroquois	Merkley Oaks Apartments Phase 1	$58,012

36 - Cardinal Dundas Street Rebuild – Bridge to Hwy 2 – System Access for Road – requested poles to be relocated behind sidewalk

Asset Class: Overhead **Classification: System Access** **Priority: High** **Location: Cardinal** **Project Year: 2027** **Forecast Cost: $128,525**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**6** **4** **5** **8** **16** **2** **41**

Project Scope

This project involves the relocation of overhead distribution infrastructure along Dundas Street, Cardinal's main arterial roadway, from Bridge Street to Highway 2. The existing pole line will be moved from its current roadside location to behind the sidewalk.

Dundas Street is a high-traffic corridor within RSL's service territory and contains primary feeder infrastructure critical to supplying the Cardinal area.

The project scope includes:

1. Replacement of 10 distribution poles
2. Installation of approximately 450 m of three-phase primary conductor
3. Installation of approximately 450 m of secondary conductor
4. Transfer of 21 residential customer services
5. Associated civil works coordinated with the subdivision and roadway reconstruction.

Upon completion of the project, the municipality will impose a five-year road moratorium, limiting future access to the corridor.

Project Driver

This project is driven by a municipal request to relocate the pole line in advance of planned road resurfacing and streetscape improvements. Relocating the poles behind the sidewalk aligns the electrical infrastructure with municipal design standards and long-term roadway plans.

Options Considered

As part of the project planning process, RSL reviewed current and projected electrical loading to confirm appropriate sizing of conductors and equipment.

An underground construction option was considered; however, it was determined to be **cost-prohibitive** relative to the scope and benefits of the project.

Risk deferral

There is no practical option to defer this project, as the relocation is required to support the municipality's road reconstruction and resurfacing schedule.

Outcomes Benefits

- Supports municipal infrastructure renewal and long-term planning.
- Maintains reliability of a key feeder supplying the Cardinal area.
- Improves streetscape consistency and safety along a major corridor.
- Coordinates utility work prior to a long-term road moratorium

Cost and Timing

The project will be completed in 2027 and is estimated at $128,525.34.

37 - Smart Meter Replacement Program (2027-2031)

Asset Class: Meters	**Safety:**	**6**
Classification: System Renewal	**Environmental Benefits:**	**4**
Priority: High	**Efficiency, Customer Value,**	**20**
Location: All Areas	**Reliability:**	**16**
Project Year: 2027-2031	**Coordination, Interoperability:**	**4**
Forecast Cost: $2,054,000	**Economic Development:**	**2**
	Cyber Security:	**51**
	Total Score:	

Year	Location	Scope	Cost
2027	All areas	Residential 900	$270,000
2028	All Areas	Commercial 100 + Residential 900	$358,000
2029	All Areas	Commercial 100 + Residential 900	$358,000
2030	All Areas	Commercial 300 + Residential 900	$534,000
2031	All Areas	Commercial 300 + Residential 900	$534,000

Project Scope

The scope of this project is the ongoing replacement of smart meters across Rideau St. Lawrence Utilities' service territory.

RSL currently has approximately 5,187 residential meters and 983 commercial meters in service. These meters were installed when Ontario LDCs were mandated to deploy smart meters province-wide. RSL utilizes Elster meter infrastructure, with an expected asset life of approximately 10 years.

To optimize capital investment and control costs, RSL has historically reverified meters through Measurement Canada to extend meter life beyond the original 10-year expectation. This strategy has generally been successful. However, RSL continues to experience meter failures at a rate of approximately 100 meters per year.

This project provides for:

- Maintaining a larger inventory of spare meters, and
- Gradually replacing the oldest meter lot batches, rather than reacting only to failures.

This proactive approach is intended to reduce the risk of widespread meter failures and mitigate supply-chain constraints.

Project Driver

- End of useful life of legacy smart meters for both residential and commercial customers.
- While RSL will continue to use reverification to extend meter life where feasible, the aging meter population increases the likelihood of:
    - Individual meter failures, and

    - Entire meter lot batches failing Measurement Canada sampling requirements.
- A structured replacement and spares strategy reduces operational risk and customer disruption.

Options Considered

Option 1 – Full System Replacement with New A4 Meters
In 2025, Elster introduced new A4 meters, which are bi-directional by default. One option considered was a full system replacement of all existing meters with A4 meters in a single program.

- This option was not pursued, as it was not considered cost prudent.
- Significant value remains in extending the life of existing meters through reverification.

Option 2 – Reactive Replacement Only
Another option was to replace meters only as failures occur or as lot batches fail Measurement Canada sampling.

- This option presents high operational risk, particularly due to long meter supply-chain lead times.
- Reactive replacement could result in inventory shortages and service disruptions.

Preferred Option – Phased Replacement with Increased Spares
The preferred approach is a phased replacement strategy, supported by an increased inventory of spare meters, balancing cost control with operational reliability.

Risk of Deferral

Deferring this project increases the risk of:

- Unplanned meter failures without sufficient inventory to respond.
- Extended customer outages or billing interruptions due to meter shortages.
- Increased costs and operational strain driven by emergency procurement and installations.

Outcomes and Benefits

This program will replace approximately 81% of commercial meters, and 70% of residential meters.

- Risk Mitigation: Reduces the likelihood of RSL being unable to replace failed meters or failed reverification batches.
- Operational Resilience: Ensures adequate meter inventory is available to address failures and aging infrastructure.

- Cost Control: Allows continued use of reverification strategies while avoiding the cost of a full system replacement.
- Improved Planning Certainty: Supports predictable capital spending and avoids emergency replacements driven by supply-chain constraints.

38 - Iroquois Plaza Kiosks – System Renewal

Asset Class: Underground **Classification: System Renewal** **Priority: High** **Location: Iroquois** **Project Year: 2026** **Forecast Cost: $259,898**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**24** **8** **10** **8** **4** **2** **56**

Project Scope

This project involves the replacement of aging and non-standard transformer kiosks at the Iroquois Plaza. The scope includes:

- Replacement of existing transformer kiosks
- Conversion of three existing transformers to pad-mounted configurations
- Installation of associated riser poles and related underground connections

Project Driver

- Safety concerns associated with aging kiosk infrastructure
- Reliability risks due to equipment condition.
- The need to address infrastructure that no longer meets current standards.

Options Considerations

1. Replace with three new transformers in kiosk configurations – This option would partially renew the infrastructure but would not adequately address safety concerns or fully meet current ESA and CSA standards.
2. Convert to pad-mounted transformers (preferred option) – This option improves safety, enhances reliability, and ensures compliance with applicable standards.

Risk deferral

Deferring this project would:

- Increase safety risks to the public and workers.
- Increase the likelihood of equipment failure and unplanned outages.
- Prolong reliance on aging, non-compliant infrastructure.

Outcomes Benefits

- Improved public and worker safety
- Enhanced system reliability
- Compliance with current ESA and CSA standards
- Reduced operational and maintenance risk.

Cost and Timing

The project is planned to be placed in service in 2027, with a total forecast capital cost of $259,898.

39 - Cardinal Feeder Load Balancing – System Service

Asset Class: Underground	**Safety:**	**6**
Classification: System Service	**Environmental Benefits:**	**8**
Priority: Medium	**Efficiency, Customer Value,**	**15**
Location: Cardinal	**Reliability:**	**4**
Project Year: 2027	**Coordination, Interoperability:**	**16**
Forecast Cost: $119,229	**Economic Development:**	**2**
	Cyber Security:	**51**
	Total Score:	

Project Scope

This project will interconnect two feeders within the RSL distribution system to enable feeder load balancing in the Cardinal service area.

The scope of work includes:

- Installation of two in-line feeder switches
- Installation of four (4) new distribution poles
- Associated conductor installation to complete the feeder tie.

This project was recommended through a third-party feeder capacity and reliability study completed in 2025.

Project Driver

The primary driver for this project is to improve reliability and system resiliency within the Cardinal distribution system.

During both planned maintenance outages and unplanned emergency events, the feeder tie will allow load to be transferred between the two distribution stations supplying Cardinal. This capability reduces customer outage duration and improves operational flexibility.

In addition, feeder load balancing enables more efficient utilization of existing distribution station capacity, maximizing the use of current assets and deferring the need for future capacity expansion.

Options Considered

Options are being evaluated for the optimal location of the in-line switches to:

- Maximize operational flexibility.
- Optimize capital investment.
- Minimize construction and system disruption.

Risk deferral

Deferring this project would maintain the current limitation of being unable to transfer load between feeders during outages. This would:

- Reduce operational flexibility during emergencies.
- Increase customer outage duration during planned and unplanned events.
- Limit the ability to optimize use of existing station capacity.

Outcomes Benefits

- Improves system resiliency.
- Improves overall reliability.
- Minimizes customer downtime during maintenance and emergency events.
- Enhances operational flexibility and capacity management.

Cost and Timing

The project will be completed in 2027 and is estimated at $119,229.

40 - NRCAN – Iroquois Reclosers and SCADA Switches (Same as 30)

Asset Class: Station **Classification: System Service** **Priority: High** **Location: Iroquois + All** **Project Year: 2026-2030** **Forecast Cost: $2,685,156 ($1,342,578 contribution from NRCAN)**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**6** **4** **20** **4** **4** **2** **40**

Project Scope:

RSL is advancing a multi-year distribution automation and SCADA enablement program, beginning in Iroquois, and expanding across the system. Historically, RSL has relied primarily on fuses for feeder protection and does not currently operate SCADA-capable switching devices.

This project introduces:

- SCADA-compatible reclosers and switches at strategic locations
- System hardening through automated fault isolation.
- The foundation for full SCADA system implementation

Reclosers will significantly reduce fuse operations, improve outage diagnostics, and enable faster restoration. While originally planned as a 10-year rollout, RSL received conditional approval in 2025 for NRCan matching grant funding, allowing the implementation timeline to be cut in half.

Project Driver:

Reliability and System Hardening

Reclosers and SCADA-enabled switches are proven, industry-standard technologies that:

- Automatically isolate faults
- Reduce sustained outages.
- Minimize customer interruptions caused by transient faults.
- Improve system sectionalization.

Faster Outage Recovery and Operational Efficiency

SCADA capability enables:

- Remote monitoring and switching
- Faster troubleshooting and restoration
- Reduced truck rolls and restoration costs
- Improved situational awareness during outages.

Funding Opportunity and Cost Effectiveness

The NRCan matching grant materially improves project economics. Proceeding now avoids higher future costs and captures federal funding that would otherwise be lost.

Options Considered

3. **Delay the Project**
   Deferral was considered but rejected due to:
   - Continued reliability limitations
   - Loss of NRCan grant funding.
   - Higher long-term costs
4. **Install Reclosers Without SCADA**
   While reclosers alone would provide some benefit, the absence of SCADA would materially limit restoration speed, analytics, and system visibility. The incremental cost of SCADA capability provides disproportionate operational benefit.

The selected approach—**SCADA-enabled reclosers**—was determined to be the most cost-effective and future-proof solution.

Risk Deferral

Deferring this project would:

- Delay RSL's reliability improvement strategy.
- Increase outage duration and restoration costs.
- Result in forfeiture of NRCan grant funding.
- Increase total lifecycle costs due to inflation and retrofits.

Outcome and Benefits

The program will deliver:

- Reduced outage frequency and duration
- Faster fault isolation and service restoration
- Improved system resilience and reliability
- Lower long-term operating and restoration costs
- A scalable foundation for advanced distribution automation

Project Cost and Timing:

Year	**Location**	**Scope**	**Cost**
2026	Iroquois MS1	4 - SCADA compatible Reclosers & Switches	$320,000
2027	Cardinal MS1& 2	4 - SCADA compatible Reclosers & Switches	$480,000
2027	Prescott MS2	2 – SCADA compatible Reclosers & Switches	$160,000
2027	Prescott MS3	4 – SCADA Compatible Reclosers & Switches	$320,000
2028	Prescott MS1	3 - SCADA compatible Reclosers & Switches	$300,000
2028	Prescott MS4	2 – SCADA Compatible Reclosers & Switches	$160,000

2029	Morrisburg MS1&2	6 – SCADA Compatible Reclosers & Switches	$480,000
2030	All areas	SCADA implementation	$465,156

This project represents a step-change in RSL's reliability, operational capability, and system resilience. Leveraging NRCan funding allows RSL to accelerate modernization, reduce customer impacts from outages, and implement proven technology at half the net cost to ratepayers.

2028-2031 – Material Projects Section

Year	Category	Project Name	Budget
2028	System Service	NR – Reclosers and Switches Prescott MS1	$200,000
2028	System Service	NR – Reclosers and Switches Prescott MS4	$160,000
2029	System Service	NR – Reclosers and Switches Morrisburg	$160,000
2030	System Service	NR – SCADA Implementation	$465,156
2028	System Access	Valecraft Phase 2 Homes	$240,986
2028	System Access	Valecraft Apartments Phase 2	$114,597
2029	System Access	Valecraft Phase 2 Homes	$120,493
2028	System Renewal	Dundas Street Rebuild – Bridge to Benson	$157,873
2028	System Renewal	Fifth Street Rear Lot Conversion	$190,392
2029	System Renewal	Caldwell Drive Rear Lot Conversion	$124,215
2029	System Renewal	Maple Street Rear Lot Conversion	$208,532
2029	System Renewal	Orchard Way Rear Lot Conversion	$268,664
2030	System Renewal	Benson Street – Rear Lot Conversion	$59,494
2030	System Renewal	Joseph Street – Small Conductor	$106,748
2030	System Renewal	Perry Street – Small Conductor	$66,175
2031	System Renewal	Alexander The Square – Rear Lot Conversion	$116,075
2031	System Renewal	Churchill E Extension (Intertie) – Rear Lot Conversion	$159,252
2031	System Renewal	Roberta Cres – Rear Lot Conversion	$313,570
2028	System Renewal	Commercial and Residential Metering	$358,000
2029	System Renewal	Commercial and Residential Metering	$358,000
2030	System Renewal	Commercial and Residential Metering	$534,000
2031	System Renewal	Commercial and Residential Metering	$534,000
2028	System Renewal	PME	$300,205
2029	System Renewal	PME	$304,905
2030	System Renewal	PME	$179,905
2031	System Renewal	PME	$139,700
2030	General Plant	Vehicle ¾ Ton	$95,000
2030	General Plant	Rear Lot Derrick	$307,000
2031	General Plant	Digger	$700,000
2028	System Access	Miscellaneous System Access	$696,000
2029	System Access	Miscellaneous System Access	$696,000
2030	System Access	Miscellaneous System Access	$696,000
2031	System Access	Miscellaneous System Access	$696,000
2028	System Access	Miscellaneous System Access Capital Contributions	-$379,000
2029	System Access	Miscellaneous System Access Capital Contributions	-$379,000
2030	System Access	Miscellaneous System Access Capital Contributions	-$379,000
2031	System Access	Miscellaneous System Access Capital Contributions	-$379,000

41 - Rear Lot Conversion and Small Conductors – Priority High

Asset Class: Overhead **Classification: System Service** **Priority: Medium** **Location: Multiple Areas** **Project Year: 2028-2031** **Forecast Cost: $1,770,991**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**18** **8** **10** **8** **8** **2** **54**

Year	Location	Scope	Cost
2028	System Renewal	Dundas Street Rebuild – Bridge to Benson	**$157,873**
2028	System Renewal	Fifth Street Rear Lot Conversion	**$190,392**
2029	System Renewal	Caldwell Drive Rear Lot Conversion	**$124,215**
2029	System Renewal	Maple Street Rear Lot Conversion	**$208,532**
2029	System Renewal	Orchard Way Rear Lot Conversion	**$268,664**
2030	System Renewal	Benson Street – Rear Lot Conversion	**$59,494**
2030	System Renewal	Joseph Street – Small Conductor	**$106,748**
2030	System Renewal	Perry Street – Small Conductor	**$66,175**
2031	System Renewal	Alexander The Square – Rear Lot Conversion	**$116,075**
2031	System Renewal	Churchill E Extension (Intertie) – Rear Lot Conversion	**$159,252**
2031	System Renewal	Roberta Cres – Rear Lot Conversion	**$313,570**

Project Scope

RSL operates a distribution system with a significant amount of rear-lot construction, reflecting historical design standards. To date, the primary focus has been on maintaining this infrastructure in a safe and reliable condition.

This project represents a strategic shift from maintaining rear-lot systems toward reconfiguring them to front-lot (roadside) construction where feasible. The scope includes:

- Relocating overhead distribution from rear yards to roadway corridors.
- Replacing aging poles, transformers, and small conductors with modern standard-sized conductors.
- Completing associated civil, service, and restoration work; and
- Coordinating system upgrades to avoid multiple future disruptions.

Moving infrastructure to the front lot:

- Improves serviceability and outage response.
- Reduces the need to access and disturb private yards.

- Enables safer and more effective vegetation management; and
- Allows future maintenance and upgrades to be completed with minimal customer disruption.

Project cost estimates include materials, construction, civil work, services, and restoration required to complete each conversion.

Project Driver

Reliability

Rear-lot systems are more difficult to access during outages, leading to longer restoration times. Front-lot construction improves fault isolation, access, and restoration speed.

Asset Lifecycle Management

Many rear-lot assets and small conductors are approaching the end of their useful lives. Coordinating conversion and conductor upgrades extends asset life by 30+ years and avoids duplicative capital spending.

Customer Satisfaction

RSL has experienced increased feedback from customers who work remotely and rely on uninterrupted electrical service. Rear-lot maintenance and outages are disruptive to daily work and home life. Relocating infrastructure reduces ongoing disruption and improves the customer experience.

Safety and Small Conductor Risk

Small conductors are more vulnerable to faults, vegetation contact, and loading constraints. Replacing them improves system safety, capacity, and long-term performance.

Options Considered

1. Maintaining Rear-Lot Infrastructure

Continuing to maintain rear-lot systems was considered; however, this approach:

- Preserves long-term accessibility challenges.
- Increases outage duration and customer disruption; and
- Results in higher lifecycle costs as assets continue to age.

2. Prioritizing and Phasing Conversions

Projects were prioritized based on:

- Asset condition.
- Reliability risk.
- Customer impact; and

- Opportunities to combine renewal work to minimize total capital and customer disruption.

Risk of Deferral

Deferring these projects would result in:

- Increased outage frequency and duration due to difficult access.
- Greater risk of property damage during failures or emergency repairs.
- Missed opportunities to optimize capital by coordinating conversions with asset renewal; and
- Continued investment in rear-lot assets that do not align with modern design standards.

RSL's objective is to avoid multiple projects on the same assets, minimizing total capital expenditure while maximizing service life.

Outcomes and Benefits

- Improved system reliability and outage response times.
- Reduced disruption and property impacts to homeowners.
- Enhanced ability to perform vegetation management and maintenance.
- Extension of asset service life by approximately 30 years; and
- A more resilient, serviceable, and customer-focused distribution system.

42 – Smart Meter Replacement Program (2027-2031) – Priority High

(Same as 37)

Asset Class: Meters **Classification: System Renewal** **Priority: High** **Location: All Areas** **Project Year: 2027-2031** **Forecast Cost: $2,054,000**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**6** **4** **20** **16** **4** **2** **51**

Year	Location	Scope	Cost
2027	All areas	Residential 900	$270,000
2028	All Areas	Commercial 100 + Residential 900	$358,000
2029	All Areas	Commercial 100 + Residential 900	$358,000
2030	All Areas	Commercial 300 + Residential 900	$534,000
2031	All Areas	Commercial 300 + Residential 900	$534,000

Project Scope

The scope of this project is the ongoing replacement of smart meters across Rideau St. Lawrence Utilities' service territory.

RSL currently has approximately 5,187 residential meters and 983 commercial meters in service. These meters were installed when Ontario LDCs were mandated to deploy smart meters province-wide. RSL utilizes Elster meter infrastructure, with an expected asset life of approximately 10 years.

To optimize capital investment and control costs, RSL has historically reverified meters through Measurement Canada to extend meter life beyond the original 10-year expectation. This strategy has generally been successful. However, RSL continues to experience meter failures at a rate of approximately 100 meters per year.

This project provides for:

- Maintaining a larger inventory of spare meters, and
- Gradually replacing the oldest meter lot batches, rather than reacting only to failures.

This proactive approach is intended to reduce the risk of widespread meter failures and mitigate supply-chain constraints.

Project Driver

- End of useful life of legacy smart meters for both residential and commercial customers.
- While RSL will continue to use reverification to extend meter life where feasible, the aging meter population increases the likelihood of:

    - Individual meter failures, and
    - Entire meter lot batches failing Measurement Canada sampling requirements.
- A structured replacement and spares strategy reduces operational risk and customer disruption.

Options Considered

Option 1 – Full System Replacement with New A4 Meters
In 2025, Elster introduced new A4 meters, which are bi-directional by default. One option considered was a full system replacement of all existing meters with A4 meters in a single program.

- This option was not pursued, as it was not considered cost prudent.
- Significant value remains in extending the life of existing meters through reverification.

Option 2 – Reactive Replacement Only
Another option was to replace meters only as failures occur or as lot batches fail Measurement Canada sampling.

- This option presents high operational risk, particularly due to long meter supply-chain lead times.
- Reactive replacement could result in inventory shortages and service disruptions.

Preferred Option – Phased Replacement with Increased Spares
The preferred approach is a phased replacement strategy, supported by an increased inventory of spare meters, balancing cost control with operational reliability.

Risk of Deferral

Deferring this project increases the risk of:

- Unplanned meter failures without sufficient inventory to respond.
- Extended customer outages or billing interruptions due to meter shortages.
- Increased costs and operational strain driven by emergency procurement and installations.

Outcomes and Benefits

This program will replace approximately 81% of commercial meters, and 70% of residential meters.

- Risk Mitigation: Reduces the likelihood of RSL being unable to replace failed meters or failed reverification batches.
- Operational Resilience: Ensures adequate meter inventory is available to address failures and aging infrastructure.
- Cost Control: Allows continued use of reverification strategies while avoiding the cost of a full system replacement.

- Improved Planning Certainty: Supports predictable capital spending and avoids emergency replacements driven by supply-chain constraints.

43 - Primary Metering Enclosures – Priority High

Asset Class: Meters **Classification: System Renewal** **Priority: High** **Location: All Areas** **Project Year: 2028-2031** **Forecast Cost: $924,715**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**24** **8** **20** **20** **4** **2** **78**

Year	**Location**	**Scope**	**Cost**
2028	Prescott + Westport	1 >44kV and 1<44kV PME	$300,205
2029	Prescott + Williamsburg	1 >44kV and 1<44kV PME	$304,905
2030	Morrisburg	1 > 44kV	$179,905
2031	All Service Areas	Spare	$139,905

Project Scope

RSL operates 10 Primary Metering Enclosures (PMEs) that meter the utility's total energy intake as an embedded distributor within the Hydro One service territory. These assets are critical to energy settlement, billing accuracy, and regulatory compliance.

The existing PME fleet consists of:

- 3 high-voltage (44 kV) PMEs, and
- 7 secondary-voltage PMEs

MP ID#'s	# of Elements	Location	PT Manufacture Date (Based on Test Records)			CT Manufacture Date (Based on Test Records)		
			A Phase	B Phase	C Phase	A Phase	B Phase	C Phase
1000011350	2	Brockville TS - Prescott West PME	1990	1990	1990	1990	1990	1990
1000006210	3	Crosby TS Westport PME	1981	1981	1981	1981	1981	1981
1000006190	3	Morrsiburg TS Best Foods T1	1985	1985	1985	1985	1985	1985
1000006200	3	Morrsiburg TS Cardinal MS1	2005	2005	2005	2005	2005	2005
1000011330	2	Morrisburg TS Morrisburg PME	1991	1991	1991	1991	1991	1991
1000015220	3	Morrisburg TS Williamsburg PME	2005	2005	2005	2005	2005	2005
1000015670	2	Morrisburg TS Caldwell T2	2006	2006	2006	2006	2006	2006
1000016020	2	Morrisburg TS Prescott East PME	1991	1991	1991	1991	1991	1991
1000019910	3	Morrisburg TS Iroquois	>2007	>2007	>2007	>2007	>2007	>2007
1000019900	3	Morrisburg TS Cardinal MS2	>2008	>2008	>2008	>2008	>2008	>2008

PMEs have an expected service life of approximately 20 years. Several units are now approaching or exceeding 40 years of service, increasing operational and compliance risk.

This multi-year program focuses on:

- Replacing PMEs that have exceeded their practical service life, and

- Establishing appropriate spare inventory for both legacy oil-based PMEs and newer replacement technologies, in accordance with regulatory requirements.

Project Driver

Regulatory and Settlement Compliance

Primary metering is foundational to RSL's ability to:

- Accurately measure energy inflows,
- Reconcile market settlements, and
- Meet regulatory obligations, including registration and settlement requirements with the Independent Electricity System Operator (IESO).

Loss of primary metering functionality would directly impair RSL's ability to operate as a compliant embedded distributor.

Asset Condition and Lifecycle Management

Aging PME enclosures present increasing risks, including:

- Component failure,
- Moisture ingress and insulation degradation, and
- Metering and data interruptions.

Proactive replacement aligns with prudent lifecycle asset management practices and supports overall system reliability.

Regulatory Requirement for Spares

Regulatory and operational standards require RSL to maintain appropriate spare PMEs for the technologies deployed on the system. This project ensures compliance by establishing spares for both existing legacy equipment and newer PME designs.

Options Considered

Like-for-Like Oil-Based PME Replacement

Traditional oil-based PME replacements were evaluated but determined to be cost-prohibitive and operationally inefficient:

- Estimated cost of approximately $120,000 per PME, and
- Lead times exceeding one year, creating material schedule and reliability risk.

Alternative PME Technologies (Preferred Option)

Given the voltage levels used on RSL's system, modern PME technologies are available that:

- Provide equivalent metering functionality,
- Improve reliability and environmental performance,
- Reduce oil-related risks, and
- Significantly lower capital cost.

Replacement of a 44 kV PME using newer technology is estimated at approximately $40,000 per unit for the unit itself, delivering material cost savings while fully meeting technical and regulatory requirements. A significant portion of the cost is related to the pole work and IT in setting up the PME.

Risk of Deferral

Deferring PME replacement increases the likelihood of enclosure failure or loss of reliable metering data. Consequences of deferral include:

- Gaps or inaccuracies in energy measurement,
- Settlement and billing challenges,
- Regulatory compliance issues, and
- Increased operational and financial risk.

Given the critical role of primary metering, deferral beyond asset condition thresholds is not considered prudent.

Outcomes and Benefits

- Maintains accurate and continuous primary metering of the distribution system.
- Supports compliance with settlement, billing, and registration requirements.
- Reduces risk of unplanned failures and data gaps.
- Avoids higher replacement costs and extended lead times associated with legacy designs.
- Aligns with prudent lifecycle asset management and risk-mitigation practices.

44 - Vehicle – Foreman Truck ¾ Ton Replacement – General Plant – Priority High

Asset Class: **Fleet Vehicle** **Classification:** **Renewal** **Priority:** **Medium** **Location:** **All Areas** **Project Year:** **2030** **Forecast Cost:** **$95,000**	**Safety:** 18 **Environmental Benefits:** 8 **Efficiency, Customer Value,** 15 **Reliability:** 16 **Coordination, Interoperability:** 16 **Economic Development:** 2 **Cyber Security:** 75 **Total Score:**

2030	Vehicle	F250 – Foreman Truck	**$95,000**

Project Scope:

This project involves the planned replacement of a 2023 ¾-ton pickup truck that will be approximately 7 years old by 2030 and is expected to be approaching the end of its reliable service life.

RSL maintains a fleet of three (3) pickup trucks, each assigned to a critical operational role:

- Operations Manager Vehicle – customer- and developer-facing role.
- Trouble Call Vehicle – emergency response and after-hours restoration; and
- Foreman / Lead Hand Vehicle – towing-capable unit for field operations.

The Foreman truck is the largest of the three, specified as a ¾-ton vehicle due to its regular use towing:

- Reel trailers.
- Dump trailers; and
- Pole trailers to and from job sites.

This capability is essential to construction, maintenance, and emergency response activities across RSL's service territory.

Options Considered:

1. Alternative Vehicle Types

Other vehicle types were evaluated. SUVs and ½-ton pickup trucks were determined to be unsuitable due to insufficient:

- Payload capacity.
- Towing capability; and
- Equipment storage required for field operations and emergency response.

2. Longer or Shorter Replacement Cycles

RSL balance's reliability, cost control, and operational readiness when managing its fleet. Service vehicles are typically replaced after **7–8 years or approximately 200,000 km**, which optimizes lifecycle cost and minimizes failure risk.

Where vehicles are inspected and confirmed to be in good mechanical condition, service life extensions may be used to defer capital expenditures. However, at this stage, RSL cannot assume that the Foreman truck's service life can be extended beyond this timeframe.

3. Vehicle Leasing or Rentals

Vehicle leasing and long-term rentals were considered but found to be more costly than ownership due to:

- High annual mileage; and
- The geographically dispersed nature of RSL's service territory.

Risk Deferral

Deferring this replacement would increase the risk of:

- Significant unplanned repair costs.
- Reduced towing and emergency response capability; and
- Increased reliance on rental vehicles or external contractors during outages or construction work.

Outcomes and Benefits

- Maintains safe, reliable, and fit-for-purpose fleet operations.
- Ensures continued emergency response and field capability.
- Reduces reliance on rental vehicles.
- Reduces dependence on external contractors for trouble calls and towing; and
- Supports long-term fleet resiliency and disciplined lifecycle management.

45 - Rear Lot Derrick – Priority Medium

Asset Class: Fleet Vehicle **Classification: New Addition** **Priority: Medium** **Location: All Areas** **Project Year: 2030** **Forecast Cost: $307,000**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**24** **4** **15** **12** **8** **2** **65**

2030	Vehicle	Back Yard Derrick and Trailer	**$307,000**

Project Scope:

This project involves the acquisition of a backyard derrick (rear-lot digger and bucket) and dedicated trailer to support RSL's evolving approach to system maintenance, renewal, and customer service.

A significant portion of RSL's distribution system is constructed in rear lots, reflecting historical design practices. As RSL undertakes long-term system renewal, a growing focus will be placed on:

- Maintaining aging rear-lot infrastructure; and
- Gradually converting rear-lot construction to front-lot (roadside) overhead construction where feasible.

The backyard derrick provides RSL with a specialized piece of equipment designed to access tight residential spaces with minimal disturbance to customer properties, enabling both maintenance and conversion work to be completed more efficiently and with less customer impact.

Project Driver:

RSL's service territory includes many residents who value small-town Eastern Ontario living while working remotely. These customers place a high priority on:

- Reliable electricity service; and
- Minimizing service interruptions and property disruption.

Rear-lot infrastructure presents unique challenges:

- Increased maintenance requirements as assets age.
- Greater customer disruption during outages and repairs; and
- Limited access for standard bucket trucks.

The backyard derrick has a **significantly smaller footprint** than RSL's existing bucket trucks, allowing crews to:

- Access rear-lot assets with reduced yard damage.
- Perform targeted maintenance more efficiently; and
- Support planned conversions of rear-lot infrastructure to roadway construction as part of system renewal.

As rear-lot conductors and structures age—often with smaller conductor sizes—this equipment will be increasingly relied upon to execute renewal and conversion work over the coming decades.

Options Considered:

1. Renting a Backyard Derrick for Planned Work

Rental options were considered; however:

- Availability can be unpredictable.
- Scheduling constraints complicate long-term planning; and
- Rental costs accumulate quickly given the anticipated volume of work.

2. Contracting Rear-Lot Work

Using contractors for rear-lot work was also evaluated. While feasible, this approach:

- Is more expensive over time.
- Reduces scheduling flexibility; and
- Limits RSL's ability to respond quickly during outages or urgent maintenance situations.

Ownership provides greater control, cost certainty, and operational flexibility.

Risk Deferral

Deferring this investment would result in:

- Reduced ability to plan and execute rear-lot maintenance and conversion work.
- Increased customer impact during outages due to less suitable equipment access.
- Greater reliance on contractors, increasing costs and coordination complexity; and
- Continued use of larger equipment that causes more yard disturbance.

Outcomes and Benefits

- Improved maintenance and renewal of rear-lot infrastructure.
- Reduced damage and disruption to customer properties and easements.
- Enhanced customer experience during outages and planned work.
- Increased flexibility to convert rear-lot designs to front-lot construction over time; and
- Improved long-term cost control by reducing reliance on contractors.

46 - Large Fleet Vehicle Digger – Priority: High

Asset Class: Fleet Vehicle **Classification: Renewal** **Priority: High** **Location: All** **Project Year: 2031** **Forecast Cost: $700,000**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**24** **8** **20** **16** **16** **2** **86**

2031	Vehicle	Large Fleet Digger	**$700,000**

Project Scope:

This project replaced a **2017 Digger Truck**, will have reached **14 years of service**. RSL operates a fleet of three large service trucks:

- One single-bucket truck
- One double-bucket truck
- One digger derrick

These trucks are critical assets used for emergency response, planned maintenance, and capital construction activities.

RSL has historically utilized fleet assets through their full useful life—and beyond where feasible—to minimize rate impacts.

The digger is utilized to dig holes as well as lift the transformers that are put into place in the system.

Project Driver:

Fleet Reliability and Operational Readiness

Service trucks are mission-critical assets. Continued reliability is required to maintain acceptable response times for outages, safety events, and customer service work. While life extension was pursued to reduce capital pressure, the age of the truck ultimately exceeded safe operating limits.

Options Considered:

Contracting Out All Service and Capital Work
RSL assessed full outsourcing of line work. This option was rejected due to:

- Higher long-term costs
- Reduced emergency response capability

- Increased restoration times during outages

RSL continues to balance internal crews for base workload with contractors for peak and specialized work.

Truck Rental
Truck rental was considered but found to be:

- More expensive than ownership over time
- Limited by availability
- Operationally constrained

Risk Deferral

The risk of deferral when the truck exceeded its viable service life is failure and unable to service the community. At that point, RSL has to search for Truck rentals or contractors which are difficult to time.

Outcomes and Benefits

Replacement of the truck restores:

- Safe operation
- Reliable emergency response capability
- Reduced reliance on rentals

- Improved fleet resiliency

47 – Miscellaneous System Access and Contributions

Asset Class: Various **Classification: System Access** **Priority: High** **Location: All** **Project Year: 2028-2031** **Forecast Cost: $696,000 (gross) and $(379,000) contributions annually**	**Safety:** **Environmental Benefits:** **Efficiency, Customer Value,** **Reliability:** **Coordination, Interoperability:** **Economic Development:** **Cyber Security:** **Total Score:**	**NA**

Project Scope:

RSL completes a significant volume of system access work on an annual basis to connect new customers and support load growth within its service territory. The scope and timing of these projects can vary materially from year to year, as commitments are typically confirmed in the year of execution or shortly in advance.

To develop forecast values for the outer years, RSL has relied on historical actuals from 2022 to 2025. The years 2026 and 2027 were not used as a basis for forecasting due to atypical and elevated system access activity levels that are still evolving and not yet representative of a normalized trend.

Project Driver:

Economic Activity

System access investments are driven by customer connections, new developments, and load growth. RSL prioritizes connecting customers in a timely manner to support economic development within its communities. Growth in the customer base also contributes to improved cost sharing across customers over time.

Options Considered:

As this category represents a portfolio of individual customer-driven projects rather than a single defined project, specific alternatives are evaluated at the time each project is initiated.

For each system access request, RSL assesses multiple design and construction options to identify the most cost-effective solution that meets technical requirements, safety standards, and customer needs.

Risk Deferral

Deferral of system access work is generally not a viable option, as these projects are driven by customer requirements and contractual obligations to provide service. Delays in execution could result in deferred customer connections, impacts to economic development, and potential reputational risk.

Outcomes and Benefits

System access investments enable the connection of new customers and support load growth across the service territory. Each project is designed to:

• Provide safe and reliable service to new and existing customers;
• Support economic development within the community;
• Ensure system operability and maintainability; and
• Deliver cost-effective solutions that balance customer needs with long-term system considerations.

APPENDIX B – ASSET CONDITION ASSESSMENT

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

REPORT 25IM-5484

Substation Condition Assessment

Rideau St. Lawrence Distribution Inc.

September 23, 2025

KPC Power
A DIVISION OF KPC UTILITY SOLUTIONS GROUP

Rideau St. Lawrence Distribution Inc.
985 Industrial Road
Prescott, ON

Attention	**Simon Wu/Layne Scott**
Project	**Substation Condition Assessment**
Job #	**25IM-5484**

Dear Simon Wu/Layne Scott,

K.P.C. Power Electrical Ltd. (KPC Power) has completed a condition assessment of the nine (9) municipal substations, located in four (4) operating areas, as requested by Rideau St. Lawrence Distribution (RSLU).

Please feel at liberty to contact our office should you have any questions or concerns. Thank you for the opportunity to have been of service.

Thank you,

Tristan Pereira
Project Manager, Technical Services Group

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

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K.P.C. POWER ELECTRICAL LTD.
395 Westney Road S., Ajax ON L1S 6M6 **T** 905.683.6636 **(24-Hour Emergency Response)**
kpcpower.com

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

Substation Condition Assessment 2025

RSLU - Substation Condition Assessment

RSLU SUBSTATION CONDITION ASSESSMENT 2025

Prepared by: Perry Ni, M.A.Sc., EIT
Reviewed by: Rhys Goldman, P.Eng.

Revision: R02 – Second Release
Date: 2025-10-22

Powerhaus Consulting
901 Guelph Line
Burlington, Ontario L7R 3N8

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Powerhaus Consulting
901 Guelph Line
Burlington, Ontario L7R 3N8

1. Revision Log

1.1.1. R01: Initial Release, 2025-09-21

1.1.1.1. Initial release.

1.1.2. R02: Second Release, 2025-10-22

1.1.3. Second release.

2. PREAMBLE

2.1. Executive Summary

Powerhaus, under contract to KPC Utility Solutions Group Inc. (KPC), was engaged by Rideau St. Lawrence Distribution (RSLU) to perform a data-driven condition assessment of their nine (9) municipal substations, located in four (4) operating areas, that would be used to plan future station projects or service activities. This information will be used to develop capital and, operations & maintenance budgets that can be incorporated in subsequent rate filing applications.

The findings of the assessment revealed several small modifications and capital projects which would maintain system reliability and ensure long-term operations for Rideau St. Lawrence. The projects were provided with priority levels based on criticality and scoring of the component, available redundancy in the event of an emergency and benefit to the station's scoring after the change is made. A detailed list is provided in Section 5.

A summary of the most impactful upgrade for each station, priority level and change in station scoring after the project is completed is provided below:

STATION	TOTAL STATION SCORE	TOP PROJECT	PRIORITY	SCORE AFTER TOP PROJECT
Cardinal MS1	3.32	Replace T1	Low	4.16
Cardinal MS2	2.75	Replace T2	Severe	4.01
Iroquois MS	3.82	Replace T1	Low	4.15
Morrisburg MS1	3.51	Replace T1	Low	4.08
Morrisburg MS2	4.28	N/A	N/A	N/A
Prescott MS1	3.66	Replace T1	Medium	4.23
Prescott MS2	2.66	N/A	N/A	N/A
Prescott MS3	3.41	Replace T1	Low	4.01
Prescott MS4	3.46	Replace T1	Low	4.15

2.2. Introduction

The data-driven condition assessment differs from the typical industry practice which relies on visual inspections and operational feedback during a site visit. The typical practice generally finds that equipment beyond manufacturer defined end-of-life should be planned for replacement. A data-driven assessment utilizes established industry maintenance practices to assess the condition of each component so that even components after manufacturer end-of-life can be considered for long-term reliability. For context, a liquid-filled transformer which rarely carries over 50% load can be expected to last well beyond its design lifespan, in many cases over 40 years.

Consumables such as insulators and lightning arresters were not evaluated in this assessment as they would normally be replaced if defective during typical maintenance activities – not as part of a capital program. The fuses and fuseholders (contact resistance) were reviewed in the switch scoring.

2.3. Methodology

The preparation of this report consisted of the following steps:

2.3.1. Data Gathering

2.3.1.1. Available maintenance reports from 2023, 2024, & 2025 were received from KPC

2.3.1.2. KPC performed maintenance services on six (6) substations between 2022 through 2024 and provided reports to the engineering team.

2.3.1.3. Site visits were performed at each substation to gather visual data on station infrastructure and accompanied by John Portt, from KPC, to establish an understanding of the station operating procedures.

2.3.2. Data Analysis

2.3.2.1. Each Substation was evaluated as follows:

2.3.2.1.1. Each major component (refer to Table 1 for Transformers, Table 2 for Switching Equipment and Table 3 for Substation Infrastructure) was assessed based on the maintenance data.

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Table 1: Transformer Equipment Scoring Rubric

CATEGORY	1	2	3	4	5	WEIGHT
Mechanical Assessment	Visible evidence of oil pooling indicating significant leak and/or rust visible on tank, radiator or conservator.	Trace amounts of oil around the transformer. Some rusting of base or structural supports of the transformer.	Transformer > 10 years old, or transformer accessory(ies) no longer functioning (i.e. liquid level, temperature gauge, etc.)	Transformer < 10 years old, no mechanical issues.	Appears brand new.	0.5
TTR	Turns Ratio Rest results differ from tap changer. Investigate results.	Not applicable.	Not applicable.	Not applicable.	Turns Ratio Test Results match tap charger configuration.	0.5
Winding Resistance	More than 1% deviation from average phase reading.	Not applicable.	Within 1% of average phase reading.	Not applicable.	Within 0.5% of average phase reading.	0.5
Dielectric Absorption Test (DAT)	DAT indicates reduced dielectric capacity, supported by DGA	Indicates reduced dielectric capacity, DGA still within specification.	DAT is lower than previous past results but still acceptable.	DAT is within satisfactory specification.	All data within specification, near initial factory test data.	1
Dissipation Factor	Greater than 1%.	Less than 1% corrected.	Less than 0.75% corrected.	Less than 0.5% corrected.	Less than 0.25% corrected.	0.5
Dissolved Gas Analysis (DGA)	DGA results continue to trend in negative direction, or results indicate contamination.	DGA results exhibit levels indicative of overheating or reduced dielectric capacity, either trend data not available or change in data.	Results exhibit levels of overheating or reduced dielectric capacity in the past, but trend data is available and level.	Results within satisfactory specification.	All data well within specification near initial factory test data.	5
Spare	No spare available.	Not applicable.	Spare transformer off-site.	Not applicable.	Spare transformer on-site.	2

Table 2: Switching Equipment Scoring Rubric

CATEGORY	1	2	3	4	5	WEIGHT
Mechanical	Mechanical operation unreliable; Enclosure exhibiting significant rust	Slow or difficult operation; small amounts of rust	< 20 years old, no mechanical issues; trace or limited amount of rust.	< 10 years old, no mechanical issues; no signs of enclosure degradation	Appears brand new.	1
Insulation Resistance	Below NETA MTS standards.	Not applicable.	Meets NETA MTS (> 1000 MΩ), phases not within 25% of averages.	Not applicable.	Meets NETA MTS (> 1000 MΩ), all phases within +/- 25% of average.	1
Contact Resistance	High resistance, visible heat damage	Phase difference > 50%	Low resistance, phase difference > 25 %	Low resistance, minor phase differences	Low resistance, all phases similar	2
Fuse Resistance	Phase difference > 50%	Phase difference > 25%	Low resistance, phase difference > 10 %	Low resistance, minor phase differences	Low resistance, all phases similar	2
Fuse Spares	No longer available new	Spares > 1 week lead time, or refurbished units only	Spares > 1 day lead time	Spares available off-shelf	Spares on-site / in storage	1

Table 3: Station Infrastructure Scoring Rubric

CATEGORY	1	2	3	4	5	WEIGHT
Building	Significant structural or mechanical issues.	Structural or mechanical concerns are visually evident.	Some signs of deterioration, moisture infiltration, etc.	No signs of deterioration.	Installation condition consistent with brand new.	1
Fencing	Significant problems with structural integrity of fencing.	Signs of deterioration of posts or open areas in wire mesh.	Some rusting of posts or minor damage to mesh.	No signs of deterioration.	Installation condition consistent with brand new.	0.5
Ground Grid	Exposed grounding conductor, areas bare of granular; major safety concern	Areas lacking granular, weeds over 2' in length; visibly would not satisfy design resistance	Weeds growing through granular, granular mostly intact, not recently tested to design resistance	Granular less than 6" deep, tested recently to design resistance	Granular at 6" depth, test ground rod visibly marked or accessible	1

Structures	Significant rusting and structural defects in steel latt ice or struc ture.	Some rusting or defects in struct ures. Clearance s or heights no l onger meet cod e.	Some rusting or d efects in structu res, no design flaw s.	No signs of dete rioration or desi gn flaws.	Installation cond ition consistent with brand new.	1
Foundations	Exposed rebar wit h visible signs of ru st and deterioration	Foundations ex hibit signs of det erioration aroun d edges and in need of patching	Foundations exhi bit some cracki ng due to age but otherwise in good condition	No signs of stres s or wear, < 10 ye ars old	No signs of wear or tear, less tha n 10 years old	1
Security	No security measures in place. Station readily accessible by unauthorized personnel.	Physical security in place, no yard lighting or extended security system	Both physical security measures and yard lighting in place. Visible from major roadways.	Some remote security in place, with physical measures and yard lighting.	Physical, and remote security features in place with yard lighting.	1
Conductors	Conductors installed or condition causing potential hazard.	Conductors or terminations appear to be deteriorating due to age or installation practices.	Some signs of deterioration of conductor or terminations.	No signs of deterioration.	Installation condition consistent with brand new.	1
Safety	Code compliancy concerns require major renovation. (> $100k)	Code compliancy concerns require restoration immediately (< $50k)	Minor code compliancy concerns require immediate restoration (< $10k)	Grandfathered code issues which can be readily corrected at next renovation.	No code compliancy concerns.	1

2.3.2.1.1.1. Assessments were broken up into several key categories based on NETA MTS equipment testing metrics and results.

2.3.2.1.1.2. A cumulative score was established for each component based on a weighting of the component scores, as presented in reach Table (Tables 1 through 3).

2.3.2.1.1.3. The station was also scored based on redundancy with respect to the ability to maintain reliable distribution downstream of the station in the event of an equipment failure (Table 4).

Table 4: Redundancy Scoring Rubric

CATEGORY	1	2	3	4	5	WEIGHT
Redundancy	No redundancy or critical spares available.	Some redundancy is provided through manual switching but not at peak loading.	Redundancy provided through spare equipment which must be relocated.	Station is redundant at the station & feeder level via manual operation.	Station is redundant at the station & feeder level via automatic operation.	2

2.3.2.1.1.4. A weighted scoring matrix (Table 5) is provided below to provide the overall station score, based on the average of individual equipment categories, station infrastructure and redundancy.

Table 5: Station Total Score

WEIGHT	DESCRIPTION	WEIGHT
Transformers	Average Score of Transformer Conditions	6
Switches	Average Score of Switch and Recloser Conditions	2
Infrastructure	Average Score of Infrastructure	1
Redundancy	Redundancy Score	1

2.3.2.1.1.5. Note that a zero (0) score is not included in any table as it would be indicative of a failed component requiring replacement before re-energization.

2.4. Recommendations

Based on the findings of the Data Analysis, project recommendations are made for each substation with an outlook over the next 1-5 years. Recommendations range from equipment replacement, spare capacity or infrastructure modifications. Projects are ranked based on impact, and recommended timeframe.

3. Condition Assessments

3.1. Cardinal MS1

Cardinal MS1 is a 44 kV to 4160V municipal substation located at 715 County Rd. 2 in the township of Cardinal, Ontario. It is one of two substations in the Cardinal area, with the other being Cardinal MS2. The transformer is a 3 MVA Oil Filled Transformer manufactured in 1953. It has been regularly maintained but never refurbished. The 4160V system runs from the transformer secondary to a three-bay S&C Metal-Enclosed Switchgear lineup that includes a metering bay and two outgoing fused switch bays. The switchgear was installed new in 2013. One feeder is normally closed at the station while the other is normally open. There is redundancy within the 4160V distribution system in Cardinal (i.e. can be switched from MS1 to MS2).

The station infrastructure consists of a small steel lattice structure for the overhead incoming dead-end, a small single column secondary riser support structure and a shed. The station has a large surface area, sufficient for future expansion or side-by-side station replacement. It is surrounded by an eight-foot barbed wire chain-link fence.

No new hourly load data was provided for Cardinal MS1. The following data is from the 2020 Condition Assessment. The load ranges from under 300 kW to approximately 1100 kW throughout the year with a cumulative township of Cardinal loading of approximately 1800 kW. This data indicates that one transformer or MS could effectively carry the Cardinal area load, providing a level of redundancy to the Cardinal distribution system. No load growth is expected.

3.1.1. Maintenance Data

The following maintenance activities were performed on December 22, 2022:

- High Voltage Switch Testing:
    - Point of isolation – switch not tested
    - Mechanical/Operational Verification
    - Contact Visual Inspection & Resistance Testing
    - Fuses & Fuseholder visual inspection & resistance testing
    - All components cleaned and fasteners verified
- Secondary Switchgear:
    - Mechanical/Operational Verification
    - Contact Visual Inspection & Resistance Testing
    - Fuses & Fuseholder visual inspection & resistance testing

    - All components cleaned and fasteners verified
- Power Transformer:
    - Bushing & Connection Verification
    - Turn Ratio Test
    - Primary & Secondary Winding Resistance
    - Capacitance Test
    - Insulation Resistance Testing
    - Oil Sampling Testing
- Lightning Arresters:
    - Insulator surface condition inspection
    - Insulation Resistance Testing
    - Connector Condition inspection
    - Grounding inspection
    - Support Structure inspection
- Potential Transformer
    - Winding Resistance verification
    - Fuse resistance verification
- Current Transformer
    - Ratio test verification
    - Insulation Resistance Testing
- Power Cables
    - Visual inspection
    - Insulation Resistance Testing

3.1.2. Equipment Assessment

The maintenance activities undertaken at the substation determined that most of the core components are in good working order, particularly the switching equipment. The cumulative scoring for the high voltage (23T1L-X not tested due to use as isolation point. Scoring is assumed from 2018 Condition assessment) and secondary switching equipment scored an average of 4.19 out of 5, with low scores effectively resulting from concern over the age of the main switch, however, this component could be replaced with used or refurbished equipment relatively quickly in the event of a failure. The main switch does not exhibit any mechanical signs of failure. Spare fuses for all switching equipment are available at the shop, according to KPC.

The power transformer on the other hand exhibits evidence of overheating and insulation degradation based on the oil analysis & dielectric testing. Due to the age of the transformer, it's possible that it may be nearing end-of-life rather than having experienced high loading or other usage-based degradation. As such, we have assessed the transformer a score of 2.8 out of 5.

3.1.3. Station Infrastructure Assessment

The station is in relatively good condition for the age of the construction. The fencing, structures, and foundations all appear in good condition and scoring at 4 out of 5 or above. The ground grid requires some maintenance of the grid surface and would benefit from weed treatment, scoring a 3 out of 5. The station would score a 3 out of 5 for security as the lock is old and needs to be updated by RSLU. Conductor condition looks to be in good condition, scoring 5 out of 5.

As some redundancy exists between Cardinal MS1 & Cardinal MS2, we established a redundancy score of 4 out 5.

3.1.4. Summary & Recommendations

Based on the substation assessment, we have developed a total score of 3.32 out of 5. The score is based on the findings that even though the transformer is potentially nearing end-of-life, there is redundancy between Cardinal DS1 and Cardinal DS2. A transformer replacement has already been scheduled.

The following minor recommendations are made to improve the reliability of the substation:

- Replace flexible bus at the transformer secondaries.
- Consider a motion-based camera system with SCADA reporting.
- Until the transformer is replaced, we recommend performing oil analysis on a bi-annual basis to develop trended DGA data

During the site visit, we identified the following procedural items which should be considered:

- The main 44kV incoming pole is split and highly aged. Low tension on the line as an in-line pole. Our recommendation, if possible, is that this pole be replaced along with the new transformer replacement.

3.2. CARDINAL MS 2

Cardinal MS2 is a 44 kV to 4160V municipal substation located at 3039 John St in the township of Cardinal, Ontario. It is the second of two substations in the Cardinal area. The transformer is a 3 MVA Oil Filled Transformer manufactured in 1952. It was refurbished in 1996 by Reliance

Transformers. The 4160V system runs from the transformer secondary down a riser to a three-bay S&C Metal-Enclosed Switchgear lineup that includes a metering bay and two outgoing fused switch bays. The switchgear was installed new in 1996. The switchgear pad was constructed to allow for a third fused switch bay. There is redundancy within the 4160V distribution system in Cardinal.

The station infrastructure consists of a concrete pole for the overhead incoming structure with underground cables connecting directly to the secondary bushings. The station has ample working space and located near industrial parking & residential properties.

No new hourly load data was provided for Cardinal MS2. The following data is from the 2020 Condition Assessment. The load ranges from under 300 kW to approximately 1000 kW throughout the year with a cumulative township of Cardinal loading of approximately 1800 kW. This data indicates that one transformer or MS could effectively carry the Cardinal area load, providing a level of redundancy to the Cardinal distribution system. No load growth is expected.

3.2.1. Maintenance Data

The following maintenance activities were performed on December 8, 2022:

- Hight Voltage Switch Testing:
  - Mechanical/Operational Verification
  - Contact Visual Inspection & Resistance Testing
  - Fuses & Fuseholder visual inspection & resistance testing
  - All components cleaned and fasteners verified
- Secondary Switchgear:
  - Mechanical/Operational Verification
  - Contact Visual Inspection & Resistance Testing
  - Fuses & Fuseholder visual inspection & resistance testing
  - All components cleaned and fasteners verified
- Power Transformer:
  - Bushing & Connection Verification
  - Turn Ratio Test
  - Primary & Secondary Winding Resistance
  - Capacitance Test
  - Insulation Resistance Testing
  - Oil Sampling Testing
- Lightning Arresters:
  - Insulator surface condition inspection

  - Insulation Resistance Testing
  - Connector Condition inspection
  - Grounding inspection
  - Support Structure inspection
- Potential Transformer
  - Winding Resistance verification
  - Fuse resistance verification
- Current Transformer
  - Ratio test verification
- Power Cables
  - Visual inspection
  - Insulation Resistance Testing

3.2.2. Equipment Assessment

The equipment assessment results of Cardinal MS2 are very similar to Cardinal MS1. The switching equipment, except for the HV CS2-T2-L fuse barrel, are in okay condition and appear to have several years of useful life remaining. We recommend investigating the HV CS2-T2-L fuse barrel at the next available maintenance activity to determine if the fuseholders require adjustment or repair to improve resistivity measurement. We scored the switching equipment an average of 3.43 out of 5 mainly due to resistance values. Spare fuses for all switching equipment are available at the shop, according to KPC.

The power transformer though does exhibit signs of deterioration in both the oil analysis and insulation resistance testing results, like the transformer for Cardinal MS1. We have assessed the transformer a score of 2.1 out of 5.

3.2.3. Station Infrastructure Assessment

The substation infrastructure appears to be in good condition except for fencing & security. The fence is out of alignment and shorter than current code requirements, scoring a 2 out of 5. The lock to the substation area is from the previous utility, scoring a 3 out of 5. As Cardinal DS1 & Cardinal DS2 feed the same load, the redundancy score is the same 4 out of 5.

3.2.4. Summary & Recommendations

Based on the substation assessment, we have developed a total score of 2.75 out of 5. The score is primarily based on the findings that the transformer is nearing the end of its service life. Due to the age of the transformer and the oil analysis, we recommend that a spare transformer or replacement transformer be considered. Given the redundancy in the area, a replacement of a transformer in either Cardinal MS1 or MS2 may be sufficient in the interim.

The following minor recommendations are made to improve the reliability of the substation:

- Investigate and test HV Fuse CS2-T2-L for insulation resistance
- Consider a motion-based camera system with SCADA reporting.
- Until the transformer is replaced, we recommend performing oil analysis on a bi-annual basis to develop trended DGA data

During the site visit, we identified the following procedural items which should be considered:

- The warning signs on the fence are highly aged and faded due to sunlight exposure. Consider replacement signage

3.3. IROQUOIS MS

Iroquois MS is a 44 kV to 8320V municipal substation located at 5799 Carman Rd in the village of Iroquois, Ontario. It is the only substation in this area, serving the small industrial and residential customers in the vicinity. The station is equipped with two transformers, along with two outgoing feeders. Transformer T1 is a 3 MVA Oil-Filled transformer built in 1953 by Brown Boveri. Transformer T1 is fed from an overhead lattice structure that is equipped with a manual air break switch, and vertical cut-out fuseholders. Transformer T1 has top-mounted HV and LV bushings, with the secondaries connecting to an open-air steel framed structure. An underground riser from the structure connects the transformer secondaries to an S&C Pad mount Switchgear unit.

Transformer T2 is a 3 MVA Oil filled transformer built in 2015 by Northern Transformer. The 44 kV main overhead structure is a dead-end framed wood pole with a vertical, double break S&C Load Break switch & fuse holders. Bare conductors connect from the base of the switch to the primary bushings of the transformer. The secondary bushings on Transformer T2 are enclosed, live-front, side mounted terminations which are connected by underground cable to an S&C Padmount Switchgear unit.

With the two transformers both connecting through the S&C Padmount Switchgear unit, Rideau St Lawrence can entirely switch the station load from one transformer to the other. Interlocking can be modified to allow the transformers to operate in parallel for added redundancy and flexibility. No remote-control capability exists either, meaning a failure would require a truck roll and manual operation of the switching equipment.

Underground cables are run to the overhead secondary structure connecting to two outgoing feeders. One feeder (11F1) is fused, while the other (11F2, newly installed in 2023) uses single phase, oil filled reclosers. The recloser is not controlled or monitored by any external device.
No new hourly load data was provided for Iroquois. The following data is from the 2020 Condition Assessment. In 2020, we were provided with load data from the secondary side of Iroquois MS. Based on the data, it appears that the station is loaded between approximately 600 kW & 2300 kW; averaging 1280 kW. An additional 500 kVA of load is expected to be added in 2020.

3.3.1. Maintenance Data

The following maintenance activities were performed on November 4, 2023:

- Hight Voltage Switch Testing:
  - Mechanical/Operational Verification
  - Contact Visual Inspection & Resistance Testing
  - Fuses & Fuseholder visual inspection & resistance testing
  - All components cleaned and fasteners verified
- Secondary Switchgear:
  - Mechanical/Operational Verification
  - Contact Visual Inspection & Resistance Testing
  - Fuses & Fuseholder visual inspection & resistance testing
  - All components cleaned and fasteners verified
- Power Transformer:
  - Bushing & Connection Verification
  - Turn Ratio Test
  - Primary & Secondary Winding Resistance
  - Capacitance Test
  - Insulation Resistance Testing
  - Oil Sampling Testing
- Lightning Arresters:
  - Insulator surface condition Inspected, Cleaned and Tested
  - Insulation Resistance Testing
  - Connector Condition inspection
  - Grounding inspection
  - Support Structure inspection
  - Insulation Resistance Testing

3.3.2. Equipment Assessment

After reviewing the maintenance reports, the two HV switching equipment are in fair condition. Spare fuses are available at the shop for both, according to KPC.

Although T1 has scored a fair 3.7 out of 5, the oil level gauge is showing that it is out of oil suggesting a leak. Although T1 is currently an unloaded spare, its age and condition make it unreliable, despite its relatively high score. It is recommended that oil analysis continue more frequently on a bi-annual basis.

T2 is in good working condition scoring a 4.1 out of 5.

No testing was done for 11-F1 and the padmount switchgear. Based on the 2020 Condition Assessment, these two are assumed to be in the same working condition.

Recloser 11F2 was changed in 2023 and assumed to be in brand new condition, 5 out of 5.

3.3.3. Station Infrastructure Assessment

The overall condition of the station infrastructure was fair except for the fencing and ground grid. The fence gate has a large gap created by the gate leaning away from the natural alignment. This poses a risk to small children as they could potentially squeeze through and resulting in a score of 3 out of 5.

The ground grid requires vegetation management for weed control as well as stone cover top up, scoring in at a 2 out of 5.

It should also be noted that one footing for the lattice structure is deteriorating and requires attention, resulting in a score of 3 out of 5.

As T1 is an unloaded backup to T2, the redundancy score was assessed as 4 out of 5.

3.3.4. Summary & Recommendations

Overall, the substation score is 3.82 out of 5.

The following minor recommendations are made to improve the reliability of the substation:

- Consider a motion-based camera system with SCADA reporting.
- Monitor T1 oil levels and refill the oil as necessary

- Annual oil analysis on T1; and to proactively remove transformer from service to avoid failure based on oil data trends
- Replace T1 to maintain substation redundancy
- Attend to the deterioration of a footing for the lattice structure

During the site visit, we identified the following procedural items which should be considered:

- The station ID signage is aged and showing damage
- There is also aviary nesting on the 5kV bus structure
- T1 nameplate is faded due to age and no longer legible

Previous load data from the 2020 Condition Assessment indicates that T2 will experience loading at around 50% capacity. This will prolong T1's expected lifespan until T1 is to be decommissioned. T1's eventual removal will decrease this substation's redundancy and increase risk of service interruptions.

3.4. MORRISBURG MS1

Morrisburg MS1 is a 44 kV to 4160V municipal substation located at 11 Fifth St. E. in the unincorporated community of Morrisburg, Ontario. It is the first of two substations in Morrisburg, with the other being Morrisburg MS2. The transformer is a 5 MVA Oil Filled Transformer that dates to 1976. It has been maintained but never refurbished. Both incoming & outgoing structures are open-air, steel lattice with concrete footings. The 44 kV incoming structure has an air-break switch, cutout fuseholders and lightning arresters. The 4160V structure supports four (4) outgoing feeders, all equipped with load break switches & fuses. One of the feeders exits via underground cables while the others are overhead.

No new hourly load data was provided for Morrisburg MS1. The following data is from the 2020 Condition Assessment. Load data for Morrisburg MS1 is provided via average load readings performed during the summer and winter months. No real-time or trended data is available as Hydro One data includes 44 kV customers in addition to the MS. The average load readings indicate loading of the station is approximately 2500 kW. No significant load growth is expected.

3.4.1. Maintenance Data

The following maintenance activities were performed on October 10, 2024:

- o Hight Voltage Switch Testing:
    - o Mechanical/Operational Verification

  - Contact Visual Inspection & Resistance Testing
  - Fuses & Fuseholder visual inspection & resistance testing
  - All components cleaned and fasteners verified
- Secondary Switchgear:
  - Mechanical/Operational Verification
  - Contact Visual Inspection & Resistance Testing
  - Fuses & Fuseholder visual inspection & resistance testing
  - All components cleaned and fasteners verified
- Power Transformer:
  - Bushing & Connection Verification
  - Turn Ratio Test
  - Primary & Secondary Winding Resistance
  - Capacitance Test
  - Insulation Resistance Testing
  - Oil Sampling Testing
- Lightning Arresters:
  - Insulator surface condition inspection
  - Insulation Resistance Testing
  - Connector Condition Cleaning & Inspection
  - Grounding inspection
  - Support Structure inspection
- High Voltage Recloser
  - Operating Mechanism operation & inspection
  - Bushings Cleaning & Inspection
  - Connections & Terminals Cleaning, Inspection & Torquing
  - Insulation resistance testing

3.4.2. Equipment Assessment

The HK Porter transformer, T1, is in fair condition considering that it is approaching 50 years of service. There was rust found on the top of the transformer, around the conduits as well as on the control box. We also saw signs of a new oil leak. Thus, the score is 3.25 out of 5.

As for the switching equipment, both the HV and LV devices are in fair condition scoring an average of 4.04 out of 5. Some deficiencies to note include the red phase of 46F1 switch and the 46F2 switch having damaged arcing contact surfaces. The 46F3 recloser bushing on the C phase is cracked and should be repaired or replaced. Spare fuses for all switching equipment are available at the shop, according to KPC.

3.4.3. Station Infrastructure Assessment

The condition of the substation infrastructure is also fair except for the storage shed (2 out of 5) and some weeds in the ground grid (3 out of 5). Although the overall condition of the fencing is good and relatively new, there is a large gap in the fence gate which poses a security risk. The redundancy score has increased to a 4 out of 5 as Morrisburg MS2 has been rebuilt in the same station yard as MS1.

3.4.4. Summary & Recommendations

The total score of Morrisburg MS1 comes in at 3.51 out of 5. The age of the transformer should be the only area of concern and should be monitored going forward.

The following minor recommendations are made to improve the reliability of the substation:

- Consider a motion-based camera system with SCADA reporting.
- Monitor T1 oil levels
- Annual oil analysis on T1

During the site visit, we identified the following procedural items which should be considered:

- The lock to the substation yard is currently from the previous utility. Switching the lock would increase security.

3.5. MORRISBURG MS2

Morrisburg MS2 was rebuilt in 2023 and was not considered in the recommendations or review given the assessed condition of the station.

3.6. PRESCOTT MS1

Prescott MS1 is a 44 kV-to-4,160 V substation featuring an open-air steel lattice primary structure, a 5 MVA transformer, and S&C metal-enclosed switchgear housed within a brick-and-mortar building. The lattice structure carries an air-break switch and fuse holders positioned directly above the transformer. A rigid IPS bus passes through the brick wall, supported by insulators on both sides, and connects via underground cable to the S&C switchgear. The station is located at 675 Corrine St, Prescott, ON.

Load data for Prescott MS1 from three days in July & three days in January suggest that the station carries approximately 1900 kW of load. Operationally, the station has some redundancy within the town of Prescott as feeders can be manually switched between the four stations in the area. No significant load growth is expected.

Given that no new maintenance data was provided for Prescott MS1 at this time, recommendations & scoring are based on information available from the 2020 Condition Assessment, new findings from the site visit performed by Powerhaus personnel, and new DGA data from KPC. Switching equipment was not re-assessed.

3.7. PRESCOTT MS2

Prescott MS2 is a 44 kV to 4160V substation consisting of a single open-air steel substation structure supporting both primary and secondary switching equipment, and a 5000 kVA ONAN transformer. The primary switch is an air break switch with separate fuseholders directly over the transformer. The secondary switch and fusing are two (2) outgoing feeders mounted vertically on the far side of the structure, away from the transformer. The station is located at 101 Churchill Rd. E, Prescott.

Load data for Prescott MS2 was provided for feeder 2 only from three days in July & three days in January which suggests the station carries 500-700 kW of load. Operationally, the station has some redundancy within the town of Prescott as feeders can be manually switched between the four stations in the area. No significant load growth is expected.

Given that no new maintenance data was provided for Prescott MS2 at this time, recommendations & scoring are based on information available from the 2020 Condition Assessment, new findings from the site visit performed by Powerhaus personnel, and new DGA data from KPC. Switching equipment was not re-assessed.

3.8. PRESCOTT MS3

Prescott MS3, with the designation of QL40, is a 44 kV to 4160V substation consisting of open-air substation structures on the primary & secondary sides of a 5 MVA Archer transformer. The primary side consists of a steel lattice riser supporting a Dominion air-break switch and fuse holders connected to the transformer's top-mounted bushings. The secondary side supplies a steel lattice framework that carries a rigid IPS bus and is equipped with four switch-and-fuse outgoing feeders. The station is located at 101 Churchill Rd. E, in the town of Prescott and is located within the same fenced perimeter as Prescott MS2.

No new hourly load data was provided for Prescott MS3. The following data is from the 2020 Condition Assessment. Load data for Prescott MS3 from three days in July & three days in January suggest that the station carries approximately 2960 kW of load. Operationally, the station has some redundancy within the town of Prescott as feeders can be manually switched between the four stations in the area. No significant load growth is expected.

3.8.1. Maintenance Data

The following maintenance activities were performed on November 27, 2024:

- Hight Voltage Switch Testing:
  - Mechanical/Operational Verification
  - Contact Visual Inspection & Resistance Testing
  - Fuses & Fuseholder visual inspection & resistance testing
  - All components cleaned and fasteners verified
- Power Transformer:
  - Bushing & Connection Verification
  - Turn Ratio Test
  - Primary & Secondary Winding Resistance
  - Capacitance Test
  - Insulation Resistance Testing
  - Oil Sampling Testing
- Lightning Arresters:
  - Insulator surface condition inspection
  - Insulation Resistance Testing
  - Connector Condition Cleaning & Inspection
  - Grounding inspection
  - Support Structure inspection
  - Insulation resistance testing

3.8.2. Equipment Assessment

Transformer T1 is 61 years old, but still in functional condition. With an overall rating of 3.2 out of 5, the only visible issues are evidence of oil leaks and the oil temperature gauge, which will not reset. The oil analysis showed that the insulating oil is in good condition, especially for a transformer late into its service life.

The switching equipment scored an average of 3.93 out of 5. Faulty arcing interrupters should be replaced along with the faulty contact surfaces of 40-F1. Spare fuses for all switching equipment are available at the shop, according to KPC.

3.8.3. Station Infrastructure Assessment

The main concern of the station infrastructure assessment was determined to be the fencing at this yard. All other categories scored in at a 3 or higher out of 5. There are some signs of rust on the structures and vegetation growing throughout the ground grid which should be maintained and topped up with stone. Being in the same yard as Prescott MS2, the redundancy is a 4 out of 5.

3.8.4. Summary & Recommendations

The total score for Prescott MS3 is a 3.41 out of 5. The score is primarily driven by the aging transformer; if it were replaced, would increase the total station score by 0.6.

While the switching equipment is in fair condition, replacing 40-F1, 40-F2 and 40-F3 would increase the total station score by 0.09.

The following minor recommendations are made to improve the reliability of the substation:

- Consider a motion-based camera system with SCADA reporting.
- Annual oil analysis on transformer T1 as well as monitor oil levels
- Install an additional ground connection between the gang-operated switch handle and the ground mat/ground grid in accordance with OESC

During the site visit, we identified the following procedural items which should be considered:

- Add a single line diagram via a lamacoid at the metering enclosure

3.9. PRESCOTT MS4

Prescott MS4, with the designation of QL30, is a 44 kV to 4160V substation consisting of open-air substation structures on both the primary & secondary sides of a 5 MVA Reliance Power transformer. The primary side is a wood pole riser structure through an S&C Air Break Switch (H20IT-L), fuseholders to the top mounted bushings of the transformer. The secondary feeds a steel lattice structure supporting rigid IPS bus that is outfitted with two (2) Cooper Kyle Type W reclosers and space for a future third. The station is located at 800 Boundary Rd in the town of Prescott, ON.

No new hourly load data was provided for Prescott MS4. The following data is from the 2020 Condition Assessment. Load data for Prescott MS4 from three days in July & three days in January suggest that the station experiences between 1350 to 1700 kW of load. Operationally, the station has some redundancy within the town of Prescott as feeders can be manually switched between the four stations in the area. No significant load growth is expected.

3.9.1. Maintenance Data

The following maintenance activities were performed on November 28, 2024:

- Hight Voltage Switch Testing:
  - Mechanical/Operational Verification
  - Contact Visual Inspection & Resistance Testing
  - Fuses & Fuseholder visual inspection & resistance testing
  - All components cleaned and fasteners verified
- Power Transformer:
  - Bushing & Connection Verification
  - Turn Ratio Test
  - Primary & Secondary Winding Resistance
  - Capacitance Test
  - Insulation Resistance Testing
  - Oil Sampling Testing
- Secondary Common Bus
  - Mechanical Inspection
  - Secondary Bus Insulation resistance testing
- High Voltage Recloser
  - Operating Mechanism operation & inspection
  - Bushings Cleaning & Inspection
  - Connections & Terminals Cleaning, Inspection & Torquing
  - Insulation resistance testing
- Power Cables
  - Visual inspection
  - Insulation Resistance Testing

3.9.2. Equipment Assessment

The Reliance Power transformer T1-2L30 is in passable condition for its age of 34 years. The max needle in winding temperature gauge is missing and there are signs of minor oil leaks from the secondary red phase bushings. T1-2L30 has a score of 3.05 out of 5.

As for the switching equipment, both the HV and LV devices are in good condition scoring an average of 4.29 out of 5. Some deficiencies to note include the low insulation resistance on the C phase of 30F2. There are also minor leaks from the reclosers 30F1 and

30F2. Spare fuses for all switching equipment are available at the shop, according to KPC.

3.9.3. Station Infrastructure Assessment

The overall condition of the station's infrastructure is good except for the conductors. There is low insulation resistance on the C phase of 30F2 resulting a 2 out of 5. The structure is showing rust and was given a 3 out of 5.

3.9.4. Summary & Recommendations

The combined score of the transformer, switching equipment and infrastructure combined to a 3.46 out of 5. There is redundancy on the Prescott system giving it 4 out of 5.

The following minor recommendations are made to improve the reliability of the substation:

- Investigate the low insulation resistance on the C phase of 30F2
- Consider a motion-based camera system with SCADA reporting.
- Annual oil analysis on transformer T1-2L30

During the site visit, we identified the following procedural items which should be considered:

- None

4. Conclusions

4.1. Substation Scoring Summary & Priorities

While each station was scored individually and summarized below with the top project and a priority rating given the concern presented by the data, local loading (i.e. if any redundancy within the area) and level of concern presented by the top project. For context, a station with a score under 3 likely requires capital planning soon, while a station above 3 is in good condition and may need only small modifications or preventative maintenance activities.

STATION	BEGINNING STATION SCORE	RECOMMENDED PROJECTS	PRIORITY	COMMENTS
Cardinal MS1	3.32	Replace T1	Low	MS2 can bear full load if required.
Cardinal MS2	2.75	Replace T2	**Severe**	MS1 can bear full load if required.
Iroquois MS	3.82	Replace T1	Low	T2 is primary unit.
Morrisburg MS1	3.51	Replace T1	Low	Less severe due to Morrisburg MS2 rebuild
Morrisburg MS2	4.28	N/A	N/A	No recommendations
Prescott MS1	3.66	Replace T1	Medium	Replace T1 due to oil leak
Prescott MS2	2.66	N/A	N/A	No recommendations
Prescott MS3	3.41	Replace T1	Low	Relatively good condition, no immediate concern due to local redundancy.
Prescott MS4	3.46	Replace T1	Low	Some redundancy on feeder and adjacent stations

The following chart illustrates the presented severity levels:

SEVERITY LEVEL	COMMENT
Very Low	No bearing on reliability.
Low	Would impact reliability but requires N-1 failure which is low risk.
Medium	Would impact reliability but requires N-1 failure but more likely to occur.
High	Would impact reliability. Could be managed in short-term durations.
Severe	Failure impacts downstream reliability.

For context, a score under 3 likely requires capital planning over the next 1-5 years, while a score above 3 implies that longer term planning can be considered.

From the above, a significant quantity of transformers is nearing end-of-life, as ascertained by the maintenance results. To better accommodate the replacement of these transformers in the capital budget, we recommend a staggered approach to the replacements. As the substations generally exhibit redundancy on the feeder level (or at the station level in some cases like Iroquois MS), a single transformer replacement can reduce the level of importance assigned to the other transformer near end-of-life.

Specifically, T2 at Cardinal MS2 should be replaced first because it would result in the greatest delta in overall station score of +1.26. Moreover, due to feeder redundancy between Cardinal MS2 and Cardinal MS1, it would reduce the priority to also replace the transformer at Cardinal MS1 since either transformer can bear the full feeder load.

Next, T1 at Prescott MS1 should be replaced due to slow oil leak. Alternatively, if load permits, Prescott MS1 could be decommissioned, with Prescott fed from MS2/MS3 and MS4 on a go-forward basis.

The following table has been developed to map potential projects and their impact to the station scoring based on our established ranking.

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901 Guelph Line
Burlington, Ontario L7R 3N8

STATION	BEGINNING STATION SCORE	RECOMMENDED PROJECTS	PRIORITY	CHANGE IN STATION SCORE	COMMENTS
Cardinal MS1	3.32	Replace T1	Low	+0.84	MS2 can bear full load if required. Recommend replacement of transformer at MS1 or MS2
Cardinal MS2	2.75	Replace T2 Refurbish or replace 33F5	**Severe** Low	+1.26 +0.12	MS1 can bear full load if required. Recommend replacement of transformer at MS1 or MS2
Iroquois MS	3.82	Replace T1 Concrete footing preventative maintenance	Low Medium	+0.33 +0.03	T2 is primary unit. Perform assessment in near future.
Morrisburg MS1	3.51	Replace T1	Low	+0.57	Less severe due to Morrisburg MS2 rebuild
Morrisburg MS2	4.28	N/A	N/A	N/A	No recommendations as MS2 was recently rebuilt. Maintain grid and current testing cadence.
Prescott MS1	3.66	Replace T1	Medium	+0.57	Replace T1 due to oil leak or decommission substation if no demand for load.
Prescott MS2	2.66	N/A	N/A	N/A	No recommendations due to lack of test reports and redundancy of stations in the Prescott area.
Prescott MS3	3.41	Replace T1 40F1, 40F2 and 40F3 Repair Grounding Repairs	Low Low Medium	+0.6 +0.09 +0.02	Relatively good condition, no immediate concern due to local redundancy. Recommend replacement at next maintenance. Recommend ASAP.

		Footing Patches	Low	+0.02	Perform assessment in near future.
Prescott MS4	3.46	Replace T1	Low	+0.69	Some redundancy on feeder and adjacent stations

4.2. Additional Topics

Through the development of this condition assessment, it was apparent that the stations are well maintained and operated to this point in their lifecycle. Based on the analysis, there are minimal projects which need to be undertaken to extend the lifetime of the stations another 10 years or more, apart from the implementation of a universal program for transformer replacement.

We do want to note that some devices did pass the condition assessment with fair maintenance results, however some actions are recommended to preserve the reliability and operation of the stations:

- HV Disconnect Switches
    - As with the Power Transformers, the HV Disconnects are approaching end-of-life and may be difficult to find spare parts for. The following stations have a HV switch score of lower than 4: Iroquois DS (T1-L), Cardinal MS2 (CS2-T2-L), Morrisburg MS1 (46T1-L), Prescott MS1 (Tower switch) are all equipped with HV Disconnects which were procured from manufacturer's which no longer exist and for which spare part capacities will deplete overtime. A program from replacement with new S&C devices may be prudent, however is not predicated on the analysis of any maintenance data. A stocked spare 44 kV disconnect is recommended as well.
- Oil Analysis
    - From the previous 2018 condition report, it appears that regular sampling has occurred (& continues to occur). Sampling on an annual or bi-annual cadence depending on existing transformer oil condition is highly recommended. If a staggered spare transformer & replacement program is selected, it will be necessary to increase the frequency of oil sampling. We recommend that any transformer identified as necessitating a replacement project be sampled at a minimum of once per year. The data should be built into a tracking sheet to establish a deterioration trend.

- Ground Grid & Fence Maintenance
    - We have noticed that some stations have reduced security due to fence age & deterioration, as well as weeds & loss of gravel. A program to reduce grounding & increase the public safety of stations in the form of fencing improvements should be pursued to ensure the longevity of substation equipment and continued service.

4.3. Design Recommendations

While this report was focused on the assessment of the substations and recommendations associated with maintaining the station reliability & infrastructure, the following topics could be considered to improve the capabilities and reliability of the station:

- For substations such as Cardinal MS1 and Cardinal MS2 where fuses are used for circuit protection, it is recommended that future component replacements include reclosers for feeder protection. Reclosers provide significant operational advantages as compared to fuses for utilities.
- We recommend reviewing the ground grid design for 44 kV utility stations on a 10-year basis due to the age of some of the stations, and the typically rising fault currents experienced in the Ontario transmission & distribution systems. The fault levels have been rising due to increasing renewables penetration, as well as increasing propensity for parallel system operation.

5. Next Steps

Following review of the review content by RSLU, additional context can be provided in a future update (if required) through budget estimation process in consultation with KPC personnel.

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6. Appendices

6.1. Appendix A: Condition Assessment Summaries

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6.2. Appendix B: Maintenance Records

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High Voltage Utility Solutions Group

REPORT

Substation Maintenance Report – Cardinal DS1

Rideau St. Lawrence

January 26, 2023

Rideau St. Lawrence
985 Industrial Rd,
Prescott, ON K0E 1T0

Attention	**Darryl Reynolds**
Project	**Substation Maintenance**
Location	**715 County Road 2, Cardinal**
Job #	**22IM-5441**

Dear Darryl,

K.P.C. Power Electrical Ltd. completed the Substation Maintenance program as requested at Cardinal DS1 located at 715 County Road 2, Cardinal on December 22nd, 2022.

Included in the report are the Observations, Recommendations and Test results.

Please feel at liberty to contact our office should you have any questions or concerns. Thank you for the opportunity to have been of service.

Thank you,

Tim Robertshaw

Field Supervisor, Substations

High Voltage Utility Solutions Group

TABLE OF CONTENTS

KPC POWER ELECTRICAL LTD.
395 Westney Road S., Ajax ON L1S 6M6 T 905.683.6636 **(24-Hour Emergency Response)**

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Observations & Recommendations

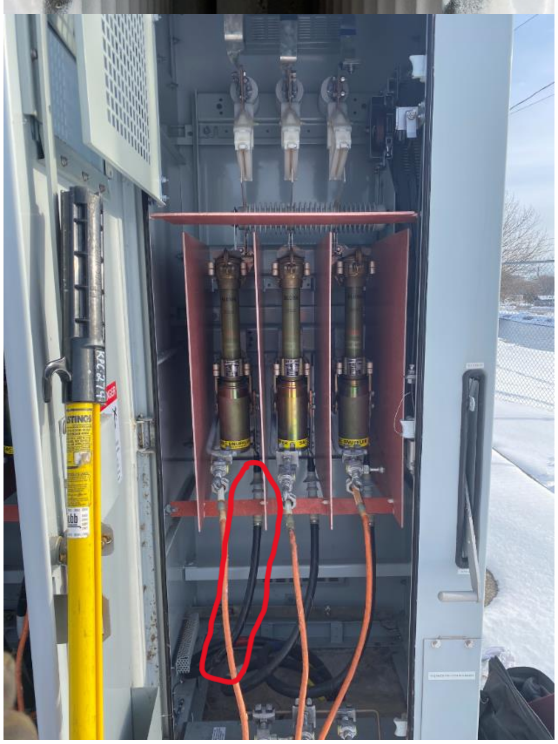
Rideau St. Lawrence - Cardinal DS1

Observations:

During the maintenance of the main power transformer it was noted that the oil level in the conservator tank was very low. Additionally, there is significant rust present on the surface of the transformer.

Recommendations:

It is strongly recommended to top up the oil in the main power transformer and apply paint to the rusted areas to prevent further corrosion.



Observations:

When performing insulation resistance testing of the 23F2 feeder cables, the red phase power cable had a low insulation resistance value of 348mΩ.

Recommendations:

Continue to monitor the insulation resistance of the cable. If further degradation occurs, additional action may be required.

High Voltage Utility Solutions Group

Inspection Sheets

Rideau St. Lawrence - Cardinal DS1

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022	
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5	**°C**
Location	715 County Road 2, Cardinal ON			**Tested By**	CP	
Substation	Cardinal DS-1			**Approved By**	VG	
Equipment I.D.	Station Yard					

Substation Yard General Inspection

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Tower Structure	OK	Inspected
Metal Enclosed Switchgear	OK	Inspected
Identification Signs	OK	Inspected
Warning Signs	OK	Inspected
Yard Debris	OK	Inspected
Weed Control	OK	Inspected
Ground Connections on Tower	OK	Inspected
Ground Connections on Switchgear	OK	Inspected
Ground Connections on Fence	OK	Inspected
Ground Connections on Gates	OK	Inspected
Ground Connections on Arresters	OK	Inspected
Ground Connections on Transformer(s)	OK	Inspected
Ground Grid + Rods Intact	OK	Inspected
Gradient Mat	OK	Inspected
Fence Assembly	OK	Inspected
Barbed Wire	OK	Inspected
Crushed Stone Depth	OK	Inspected

Lightning Arresters - See LA Sheet				
Manufacturer	-	**Voltage**	-	**kVolts**
Type/Cat #	-	**MCOV**	-	**kVolts**

Electrical Tests		
Test Description		
Ground Resistance	**Ω**	-

Test Conditions	Cool/Sunny
Results Satisfactory	OK
Test Equipment	Visual Inspection

Notes:

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5 °C
Location	715 County Road 2, Cardinal ON			**Tested By**	n/a
Substation	Cardinal DS-1			**Approved By**	VG
Equipment I.D.	Incoming 44kV LBS				

High Voltage Air/Load Break Switch

Nameplate Data - NOT TESTED

Manufacturer		**Voltage**		**kVolt**
Type		**Current**		**Amps**
Style #		**B.I.L.**		**kVolt**
Cat #		**Serial #**		

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism		
Stationary Contact Surfaces		
Moving Contact Surfaces		
Arcing Contact Surfaces		
Contact Alignment		
Arcing Interrupter		
Connector Condition		
Insulator Condition		
Phase Barrier Condition		
Grounding		
Lightning Arrester		
Gradient Mat		
Key Interlock		
Heaters & Thermostat		
Support Structure Condition		
Potential Indicators		

Electrical Tests

Test Description		φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance @ kV	**GΩ**						
Contact Resistance @ A	**μΩ**						
Arc Interrupter Resistance	**Ω**						

Test Conditions	
Results Satisfactory	
Test Equipment	

Notes: Point of isolation - switch not tested.

Client Information

Customer	Rideau St. Lawerance			Date Tested	12/22/2022	
File Number	22IM-5441	Customer Ref.	Darryl Reynolds	Ambient Temp	-5	°C
Location	715 County Road 2, Cardinal ON			Tested By	TR	
Substation	Cardinal DS-1			Approved By	VG	
Equipment I.D.	44kV Surge Protection					

Lightning Arrester Inspection

Nameplate Data						
Manufacturer	Ohio Brass			Voltage	48	kVolts
Cat #	-			MCOV	39	kVolts
Serial #	J18200	J18201	J18202	Duty Cycle Rating	48	kVolts

Capacitance and Power Factor Test - N/T

Insulation Tested	Test Mode	kV	Cap (pF)	Power factor Measured	Power factor Cor. to 20°C	mA	Watts
CH-G - Aϕ	GrndST						
CH-G - Bφ	GrndST						
CH-G - Cφ	GrndST						

Insulation Resistance (GΩ)

@ 10 kVDC		
Ins. Type: X Solid / Oil	φ A	φ B	φ C
Insulation Res. @ -5 °C	40	48	34
Corrected to 20°C	12.8	15.36	10.88

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Insulator Surface Condition	OK	Inspected
Connector Condition	OK	Inspected
Grounding	OK	Inspected
Support Structure	OK	Inspected

Test Conditions	Cool/Sunny
Results Satisfactory	OK
Test Equipment	10kV AEMC Megohmmeter

Notes:

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022	
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5	**°C**
Location	715 County Road 2, Cardinal ON			**Tested By**	TR	
Substation	Cardinal DS-1			**Approved By**	VG	
Equipment I.D.	44kV Primary Protection (23TX1L-X)					

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C	**Max Voltage**	46	**kVolt**
Type	SMD-2C	**Max Current**	-	**Amps**
Style/Cat #	-	**Serial #**	-	
Fuse Link Nameplate Data				
Type	-	**TCC**	-	
Style/Cat #	-	**Amps**	-	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated
Contact Surfaces	OK	Inspected
Contact Penetration	OK	Inspected
Contact Alignment	OK	Inspected
Expulsion-Limiting Filters	OK	Inspected
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	N/A	
Support Structure	OK	Inspected
Heaters & Thermostat	N/A	
Spare Fuse Quality	OK	
Spare Fuse Quantity	OK	3 Spares

Electrical Tests - N/T									
Test Description				**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	**kV**	**GΩ**						
Contact Resistance	**@**	**A**	**μΩ**						

Test Conditions	
Results Satisfactory	
Test Equipment	

Notes:

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5 °C
Location	715 County Road 2, Cardinal ON			**Tested By**	
Substation	Cardinal DS-1			**Approved By**	VG
Equipment I.D.	Main Transformer				

Power Transformer - Electrical

Nameplate Data

Manufacturer	Brown Boveri		**Vector Group**	Dyn11	**NGR**		**Solid**
Year Built	1953		**Serial #**	197	**Res.**		**Ω**
Type	ONAN		**Liquid Type/Volume**	Mineral Oil	8500	**L.**	
Sealed		**Conservator** X **Dry Type**	**Total Weight**	27100	**Kg.**		
Rating	3000	**kVA**	**Primary Voltage**	44	**kVolts**		
Impedance	5.5	**%**	**Secondary Voltage**	4160	**Volts**		
Phase	3	**φ**	**BIL (Primary)**	- **kV**	**BIL (Secondary)**	-	**kV**
Oil Temp	- **°C**	**Max Oil Temp** - **°C**	**Winding Temp**	- **°C**	**Max Winding Temp**	-	**°C**

Insulation Resistance

Test Voltage	**Hi** 10 **Low** 4 **kVdc**	**H to L + Grnd**	**L to H + Grnd**	**H to L**	**Core**
GΩ @ -5 °C		0.6	0.24	0.8	-
Corrected to 20 °C		0.108	0.0432	0.144	-

Capacitance & Dissipation Factor

Test Voltage **High** 10 **Low** 2	$C_{H-L} + C_{H-G}$	C_{H-G}	C_{H-L}	C_{L-G}	$C_{L-H} + C_{L-G}$
Capacitance (pF)	7212.6	1896.4	5316.9	5005.6	10355
Current (mA)	27.2	7.16	20.04	3.78	7.81
Watts (W)	3.04	1.02	2.016	0.074	0.19
Power Factor	11.178	1.4248	1.006	0.991	1.2224

Turns Ratio Test

Tap	**Primary Volts**	**Calculated Ratio**	**H1-H2 X0-X1**			**H2-H3 X0-X2**			**H3-H1 X0-X3**		
			Ratio	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**
1											
2	42900	10.3125	10.3059	-0.06	4.39	10.3016	-0.11	3.6	10.3064	-0.06	3.4
3											
4											
5											

Winding Resistance

Tap	**Current Scale**	**Resistance Unit**	**H1-H2**	**H2-H3**	**H3-H1**	**X0-X1**	**X0-X2**	**X0-X3**
2	1A/5A	Ω/mΩ	3.165	3.164	3.152	15.087	15.282	15.382

Tap Position Found & Left	2/2
Results Satisfactory	OK
Test Equipment	Omicron Testrano 600, 10kV AEMC Megohmmeter

Notes:

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5 °C
Location	715 County Road 2, Cardinal ON			**Tested By**	TR
Substation	Cardinal DS-1			**Approved By**	VG
Equipment I.D.	Main Transformer				

Power Transformer (Liquid Filled) - Mechanical

Mechanical Inspections						
Description of Inspection		**Status**				**Comments**
		OK/FAIR/POOR/NA				
Breather & Silica Gel		N/A				
Conservator Tank Gaskets		OK				
Explosion Vent Gaskets		OK				
Inspection Cover Gaskets		OK				
Main Cover Gaskets		OK				
Primary Bushing Gaskets		OK				
Primary Bushing Porcelain		OK				
Primary Bushing Connections		OK				
Primary Throat Gaskets		N/A				
Secondary Bushing Gaskets		OK				
Secondary Bushing Porcelain		OK				
Secondary Bushing Connections		OK				
Secondary Throat Gaskets		N/A				
Pressure Relief Device		OK				**PSI** -
Gas Relay		N/A				
Fan Operation		N/A				
Control Wiring		N/A				
Tap Changer		OK				
Paint Condition		POOR				Paint in poor condition **Colour** Grey
Pads		OK				
Grounding		OK				
Radiator		OK				
Oil Level		POOR				Oil level is very low - reccomended to top up.
Pressure Gauge		N/A				
Oil Temperature Gauge		N/A				
Winding Temperature Gauge		N/A				
Oil Temperature	**Run | Max**	-	°C	-	°C	
Winding Temperature	**Run | Max**	-	°C	-	°C	

Results Satisfactory	POOR
Test Equipment	Visual Inspection

Notes: Strongly recommended to add oil to the transformer and paint the rusted areas.

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022	
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5	**°C**
Location	715 County Road 2, Cardinal ON			**Tested By**	CP	
Substation	Cardinal DS-1			**Approved By**	VG	
Equipment I.D.	4.16kV Switchgear					

Switchgear Assembly Inspection

Nameplate Data				
Manufacturer	S&C	**Voltage**	4160	**kVolts**
Type	Metal Clad Switchgear	**Current**	600	**Amps**
Style/Cat #	CDT-594553	**B.I.L**	60	**kVolts**
Phase/Wire	3/4	**Serial #**	-	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Identification / Warning Signs	OK	Inspected
Lightning Arresters	N/A	
Grounding	OK	Inspected
Bus Support Insulators	OK	Cleaned and Inspected
Bus Torque	OK	Inspected
Phase Barriers	OK	Cleaned and Inspected
Compartment Barriers	OK	Inspected
C.T. Wiring	OK	Inspected
P.T. Wiring	OK	Inspected
Indicating Meters	OK	Inspected
Control Wiring	OK	Inspected
Paint Condition	OK	Inspected
Mechanical Integrity of Enclosure	OK	Inspected
Heaters	OK	Inspected
Interior Dry	OK	Inspected

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	5	**kV**	**GΩ**	8.45	8.59	15.5	18.05	22.92	24.75
AC Hi-Pot	**@**		**kV**	**μA**						

Test Conditions	Cool/Sunny
Results Satisfactory	OK
Test Equipment	10kV AEMC Megohmmeter

Notes:

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5 °C
Location	715 County Road 2, Cardinal ON			**Tested By**	CP/DS
Substation	Cardinal DS-1			**Approved By**	VG
Equipment I.D.	4.16kV CT				

Current Transformer Ratio Test

Nameplate Data				
Manufacturer	SADTEM	**C.T. Voltage Rating**	5	**kVolts**
Type	SW45	**B.I.L.**	60	**kVolts**
Style/Cat #	2007-N343843	**Accuracy**	0.3	
In Use Ratio	40:1	**Available Ratio Taps**	40:1	

Electrical Tests			
Phase	**φ A**	**φ B**	**φ C**
Position			
Serial #	-	-	-

Insulation Resistance (GΩ) @ 5kV			
Winding	**φ A**	**φ B**	**φ C**
Primary	8.45	8.59	12.5

Winding Resistance (Ω)			
Winding	**φ A**	**φ B**	**φ C**

Ratio & Polarity				
Winding	**Calc. Ratio**			
Polarity Confirmed	Y			

Test Conditions	Cool/Sunny
Results Satisfactory	OK
Test Equipment	10kV AEMC Megohmmeter

Notes:

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5 °C
Location	715 County Road 2, Cardinal ON			**Tested By**	CP/DS
Substation	Cardinal DS-1			**Approved By**	VG
Equipment I.D.	4.16kV PT				

Potential Transformer Ratio Test

Nameplate Data				
Manufacturer	SADTEM	**Primary Voltage**	5	**kVolts**
Type	RY15	**B.I.L.**	60	**kVolts**
Style/Cat #	2007-N343871	**Accuracy**	0.3	
In Use Ratio	20:1	**Available Ratio Taps**	20:1	

Electrical Tests

Phase	**φ A**	**φ B**	**φ C**
Position			
Serial #	-	-	-

Insulation Resistance (GΩ) @ 5kV

Winding	**φ A**	**φ B**	**φ C**
Primary	8.45	8.59	12.5

Winding Resistance (Ω)

Winding	**φ A**	**φ B**	**φ C**
Primary	30.9	31.6	31
Secondary	0.3	0.4	0.3

Ratio & Polarity

Winding	**Calc. Ratio**			

Polarity Confirmed: Y

Test Conditions	Sunny/Cool
Results Satisfactory	OK
Test Equipment	Fluke 117DMM, 10kV AEMC Megohmmeter

Notes: Fuse Resistance: A - 1.1Ω B - 1.1Ω C - 1.1Ω

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022	
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5	°C
Location	715 County Road 2, Cardinal ON			**Tested By**	CP	
Substation	Cardinal DS-1			**Approved By**	VG	
Equipment I.D.	23F1					

High Voltage Air/Load Break Switch

Nameplate Data				
Manufacturer	S&C	**Voltage**	4.16kV	**kVolt**
Type	Mini-Rupter	**Current**	600	**Amps**
Style #	-	**B.I.L.**	60	**kVolt**
Cat #	-	**Serial #**	-	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Greased and Operated
Stationary Contact Surfaces	OK	Cleaned and Greased
Moving Contact Surfaces	OK	Cleaned and Greased
Arcing Contact Surfaces	OK	Enclosed
Contact Alignment	OK	Inspected
Arcing Interrupter	OK	Inspected
Connector Condition	OK	Inspected
Insulator Condition	OK	Cleaned and Inspected
Phase Barrier Condition	OK	Cleaned and Inspected
Grounding	OK	Inspected
Lightning Arrester	N/A	
Gradient Mat	N/A	
Key Interlock	N/A	Utility Lock
Heaters & Thermostat	OK	Inspected
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	@	5	kV	GΩ	8.45	8.59	15.5	18.05	22.92	24.75
Contact Resistance	@	10	A	µΩ	72	71	75			
Arc Interrupter Resistance				Ω	-	-	-			

Test Conditions	Sunny/Cool
Results Satisfactory	OK
Test Equipment	10kV AEMC Megohmmeter, 10A AEMC Microohmmeter

Notes: `

Client Information

Customer	Rideau St. Lawerance			Date Tested	12/22/2022	
File Number	22IM-5441	Customer Ref.	Darryl Reynolds	Ambient Temp	-5	°C
Location	715 County Road 2, Cardinal ON			Tested By	CP	
Substation	Cardinal DS-1			Approved By	VG	
Equipment I.D.	23F1					

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C	Max Voltage	7.2 (Max 8.3)	kVolt
Type	SM-5	Max Current	400E	Amps
Style/Cat #	86641R2	Serial #	-	
Fuse Link Nameplate Data				
Type	SM5	TCC	119-4	
Style/Cat #	261600R4	Amps	400E	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Greased and Operated
Contact Surfaces	OK	Cleaned and Greased
Contact Penetration	OK	Inspected
Contact Alignment	OK	Inspected
Expulsion-Limiting Filters	OK	Inspected
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Cleaned and Inspected
Phase Barrier Condition	OK	Cleaned and Inspected
Support Structure	OK	Inspected
Heaters & Thermostat	OK	Inspected
Spare Fuse Quality	OK	Inspected
Spare Fuse Quantity	OK	6 Spares

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	@	5	kV	GΩ	8.45	8.59	15.5	18.05	22.92	24.75
Contact Resistance	@	10	A	μΩ	421	455	464			

Test Conditions	Sunny/Cool
Results Satisfactory	OK
Test Equipment	10kV AEMC Megohmmeter, 10A AEMC Microohmmeter

Notes:

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5 °C
Location	715 County Road 2, Cardinal ON			**Tested By**	CP
Substation	Cardinal DS-1			**Approved By**	VG
Equipment I.D.	23F2				

High Voltage Air/Load Break Switch

Nameplate Data				
Manufacturer	S&C	**Voltage**	4.16kV	**kVolt**
Type	Mini-Rupter	**Current**	600	**Amps**
Style #	-	**B.I.L.**	60	**kVolt**
Cat #	-	**Serial #**	-	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Greased and Operated
Stationary Contact Surfaces	OK	Cleaned and Greased
Moving Contact Surfaces	OK	Cleaned and Greased
Arcing Contact Surfaces	OK	Enclosed
Contact Alignment	OK	Inspected
Arcing Interrupter	OK	Inspected
Connector Condition	OK	Inspected
Insulator Condition	OK	Cleaned and Inspected
Phase Barrier Condition	OK	Cleaned and Inspected
Grounding	OK	Inspected
Lightning Arrester	N/A	
Gradient Mat	N/A	
Key Interlock	N/A	Utility Lock
Heaters & Thermostat	OK	Inspected
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests							
Test Description		**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance @ 5 **kV**	**GΩ**	8.45	8.59	15.5	18.05	22.92	24.75
Contact Resistance @ 10 **A**	**μΩ**	69	73	72			
Arc Interrupter Resistance	**Ω**	-	-	-			

Test Conditions	Sunny/Cool
Results Satisfactory	OK
Test Equipment	10kV AEMC Megohmmeter, 10A AEMC Microohmmeter

Notes:

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022	
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5	**°C**
Location	715 County Road 2, Cardinal ON			**Tested By**	CP	
Substation	Cardinal DS-1			**Approved By**	VG	
Equipment I.D.	23F2					

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C	**Max Voltage**	7.2 (Max 8.3)	**kVolt**
Type	SM-5	**Max Current**	400E	**Amps**
Style/Cat #	86641R2	**Serial #**	-	
Fuse Link Nameplate Data				
Type	SM5	**TCC**	119-4	
Style/Cat #	261600R4	**Amps**	400E	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Greased and Operated
Contact Surfaces	OK	Cleaned and Greased
Contact Penetration	OK	Inspected
Contact Alignment	OK	Inspected
Expulsion-Limiting Filters	OK	Inspected
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Cleaned and Inspected
Phase Barrier Condition	OK	Cleaned and Inspected
Support Structure	OK	Inspected
Heaters & Thermostat	OK	Inspected
Spare Fuse Quality	OK	Inspected
Spare Fuse Quantity	OK	6 Spares

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	5	**kV**	**GΩ**	8.45	8.59	15.5	18.05	22.92	24.75
Contact Resistance	**@**	10	**A**	**μΩ**	400	461	464			

Test Conditions	Sunny/Cool
Results Satisfactory	OK
Test Equipment	10kV AEMC Megohmmeter, 10A AEMC Microohmmeter

Notes:

Client Information

Customer	Rideau St. Lawerance			**Date Tested**	12/22/2022
File Number	22IM-5441	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	-5 °C
Location	715 County Road 2, Cardinal ON			**Tested By**	CP
Substation	Cardinal DS1			**Approved By**	VG
Equipment I.D.	Power Cables				

Power Cable Inspection

Nameplate Data

Manufacturer	Nexans	**Voltage**	28	**kVolts**
Insulation Type	TR-XLPE	**Ambient Temp**	-5	**°C**
Conductor Type	250KCMIL	**Year**	2013	**%**

Electrical Tests

Feeder Identification	**Cables Per φ**	**Insulation Resistance (GΩ) Aφ**	**Bφ**	**Cφ**	**A/B**	**B/C**	**C/A** (Tested @ 10 kV)
TX-SWG	1	8.45	8.59	12.5	18.05	22.92	24.75

Nameplate Data

Manufacturer	No info on jacket	**Voltage**	No info on jacket	**kVolts**
Insulation Type	No info on jacket	**Ambient Temp**	-5	**°C**
Conductor Type	No info on jacket	**Year**	No info on jacket	**%**

Feeder Identification	**Cables Per φ**	**Insulation Resistance (GΩ) Aφ**	**Bφ**	**Cφ**	**A/B**	**B/C**	**C/A** (Tested @ 5 kV)
23F1	1	0.348	15.85	3.117	19.27	20.62	3.098

Nameplate Data

Manufacturer	No info on jacket	**Voltage**	15	**kVolts**
Insulation Type	XLPE (133% Ins Level)	**Ambient Temp**	-5	**°C**
Conductor Type	4/0 Cu	**Year**	1988	**%**

Feeder Identification	**Cables Per φ**	**Insulation Resistance (GΩ) Aφ**	**Bφ**	**Cφ**	**A/B**	**B/C**	**C/A** (Tested @ 10 kV)
23F2	1	18.1	17.2	25.04	43.8	51.3	50.9

Test Conditions	Sunny/Cool
Results Satisfactory	FAIR
Test Equipment	10kV AEMC Meghommeter

Notes: Continue to monitor the insulation resistance of the red phase power cable on feeder 23F1.

High Voltage Utility Solutions Group

REPORT

Substation Maintenance Report - Rideau St. Lawrence

Rideau St. Lawrence

High Voltage Utility Solutions Group

January 13, 2023

Rideau St. Lawrence.
3039 John Street
Cardinal, ON K0E 1E0

Attention	**Darryl Reynolds**
Project	**Substation Maintenance**
Location	**3039 John Street.**
Job #	**22IM-5441**

Dear Darryl,

K.P.C. Power Electrical Ltd. completed the Substation Maintenance program as requested at Rideau St. Lawrence. located at 3039 John Street on December 8th, 2022.

Included in the report are the Observations, Recommendations and Test results.

Please feel at liberty to contact our office should you have any questions or concerns. Thank you for the opportunity to have been of service.

Thank you,

Tim Robertshaw

Field Supervisor, Substations

High Voltage Utility Solutions Group

TABLE OF CONTENTS

KPC POWER ELECTRICAL LTD.
395 Westney Road S., Ajax ON L1S 6M6 T 905.683.6636 **(24-Hour Emergency Response)**

High Voltage Utility Solutions Group

Observations & Recommendations

Rideau St. Lawrence

Observation:

KPC Technicians found that the warning signs are faded and unable to read.

Recommendation:

It is our recommendation that new signage is installed to ensure safety of the general public.

Observation:

When conducting maintenance on the HV Switch, KPC Technicians found that the B phase blade was not properly aligned.

Recommendation:

KPC technicians temporarily fixed the switch while on site.

It is our recommendation that the line to load switch arms are replaced.

Observation:

KPC Technicians noted that the Primary Incoming Fuse Barrels were severely weathered. It was also noted that there were no spare fuses available on site.

Recommendation:

It is our recommendation that the fuses are repainted. And that 3 spare fuses are available on site at all times in the case of emergencies.

Observation:

When conducting maintenance on the Primary Transformer, KPC Technicians found that the Secondary Bushings were cracked.

Recommendation:

It is our recommendation that the bushings are resealed and recoated to restore the integrity of the insulation.

High Voltage Utility Solutions Group

Inspection Sheets

Rideau St. Lawrence

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	12/08/2022
File Number	22IM-5441	**Customer Ref.**		**Ambient Temp**	6 °C
Location	3039 John St. Cardinal			**Tested By**	CP
Substation	Cardinal DS 2			**Approved By**	VG
Equipment I.D.	Main Yard				

Substation Yard General Inspection

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Tower Structure	OK	Inspected
Metal Enclosed Switchgear	OK	Inspected
Identification Signs	OK	Inspected
Warning Signs	**POOR**	**Faded-need to be replaced**
Yard Debris	OK	Inspected
Weed Control	OK	Inspected
Ground Connections on Tower	OK	Inspected
Ground Connections on Switchgear	OK	Inspected
Ground Connections on Fence	OK	Inspected
Ground Connections on Gates	OK	Inspected
Ground Connections on Arresters	OK	Inspected
Ground Connections on Transformer(s)	OK	Inspected
Ground Grid + Rods Intact	OK	Inspected
Gradient Mat	OK	Inspected
Fence Assembly	OK	Inspected
Barbed Wire	OK	Inspected
Crushed Stone Depth	OK	Inspected

Lightning Arresters				
Manufacturer	Ohio Brass	**Voltage**	48	**kVolts**
Type/Cat #	30039	**MCOV**	39	**kVolts**

Electrical Tests		
Test Description		
Ground Resistance	**Ω**	

Test Conditions	Outdoor
Results Satisfactory	OK
Test Equipment	N/A

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	12/08/2022
File Number	22IM-5441	**Customer Ref.**		**Ambient Temp**	6 °C
Location	3039 John St. Cardinal			**Tested By**	AA
Substation	Cardinal DS 2			**Approved By**	VG
Equipment I.D.	Incoming -CS2-T2-L				

High Voltage Air/Load Break Switch

Nameplate Data				
Manufacturer	N/A	**Voltage**	46	**kVolt**
Type	Airbreak	**Current**	600	**Amps**
Style #	N/A	**B.I.L.**	250	**kVolt**
Cat #	30-27944	**Serial #**	N/A	

Mechanical Inspections

Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Cleaned, Greased and Inspected
Stationary Contact Surfaces	OK	Cleaned, Greased and Inspected
Moving Contact Surfaces	OK	Cleaned, Greased and Inspected
Arcing Contact Surfaces	OK	Cleaned, Greased and Inspected
Contact Alignment	**POOR**	**B phase blade does not align fully**
Arcing Interrupter	OK	Inspected
Connector Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	OK	Inspected
Grounding	OK	Inspected
Lightning Arrester	OK	Inspected
Gradient Mat	OK	Inspected
Key Interlock	OK	Inspected
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests

Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	10	**kV**	**GΩ**	N/A	N/A	N/A			
Contact Resistance	**@**	10	**A**	**μΩ**	1483	1257	1292			
Arc Interrupter Resistance				**Ω**	OK	OK	OK			

Test Conditions	Outdoor
Results Satisfactory	**Poor**
Test Equipment	10A Microhmmeter,

Notes: Name plate faded, CR is high

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	12/08/2022
File Number	22IM-5441	**Customer Ref.**		**Ambient Temp**	6 °C
Location	3039 John St. Cardinal			**Tested By**	CP
Substation	Cardinal DS 2			**Approved By**	VG
Equipment I.D.	33F4				

High Voltage Air/Load Break Switch

Nameplate Data

Manufacturer	S&C	**Voltage**	4.8-5.5-6.0	**kVolt**
Type	Mini-Rupter	**Current**	600	**Amps**
Style #		**B.I.L.**	60	**kVolt**
Cat #		**Serial #**	255420R1	

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Stationary Contact Surfaces	OK	Inspected
Moving Contact Surfaces	OK	Inspected
Arcing Contact Surfaces	OK	Inspected
Contact Alignment	OK	Inspected
Arcing Interrupter	OK	Inspected
Connector Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	OK	Inspected
Grounding	OK	Inspected
Lightning Arrester	N/A	
Gradient Mat	N/A	
Key Interlock	N/A	Locked
Heaters & Thermostat	OK	Inspected
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests

Test Description					φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance	@	5	kV	GΩ	90.5	116.2	137.6	210	396	327
Contact Resistance	@	10	A	μΩ	93	79	88			
Arc Interrupter Resistance				Ω	N/A	N/A	M/A			

Test Conditions	Outdoor
Results Satisfactory	Ok
Test Equipment	10kV Megohmmeter, 10A Microhmmter

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	12/08/2022
File Number	22IM-5441	**Customer Ref.**		**Ambient Temp**	6 °C
Location	3039 John St. Cardinal			**Tested By**	CP
Substation	Cardinal DS 2			**Approved By**	VG
Equipment I.D.	33F5				

High Voltage Air/Load Break Switch

Nameplate Data

Manufacturer	S&C	**Voltage**	4.8-5.5-6.0	**kVolt**
Type	Mini-Rupter	**Current**	600	**Amps**
Style #		**B.I.L.**	60	**kVolt**
Cat #		**Serial #**	255420R1	

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Stationary Contact Surfaces	OK	Inspected
Moving Contact Surfaces	OK	Inspected
Arcing Contact Surfaces	OK	Inspected
Contact Alignment	OK	Inspected
Arcing Interrupter	OK	Inspected
Connector Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	OK	Inspected
Grounding	OK	Inspected
Lightning Arrester	N/A	
Gradient Mat	N/A	
Key Interlock	N/A	
Heaters & Thermostat	OK	Inspected
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests

Test Description		φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance @ 5 kV	GΩ	90.5	116.2	137.6	210	396	327
Contact Resistance @ 10 A	μΩ	88	87	81			
Arc Interrupter Resistance	Ω	N/A	N/A	N/A			

Test Conditions	Outdoor
Results Satisfactory	OK
Test Equipment	10kV Megohmmeter, 10A microhmmeter

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	12/08/2022
File Number	22IM-5441	**Customer Ref.**		**Ambient Temp**	6 °C
Location	3039 John St. Cardinal			**Tested By**	AA
Substation	Cardinal DS 2			**Approved By**	VG
Equipment I.D.	Incoming Fuse				

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C	**Max Voltage**	46	**kVolt**
Type	Smd-2C	**Max Current**	3006	**Amps**
Style/Cat #	186925R1-T4	**Serial #**		
Fuse Link Nameplate Data				
Type	SMD-2C	**TCC**	153-1	
Style/Cat #		**Amps**	65E	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated
Contact Surfaces	OK	Cleaned/Greased
Contact Penetration	OK	Inspected
Contact Alignment	OK	Inspected
Expulsion-Limiting Filters	N/A	
Fuse Barrel Condition	**POOR**	**Severely weathered**
Connecter Condition	**FAIR**	**Corroded lug connections**
Insulator Condition	OK	Inspected
Phase Barrier Condition	N/A	
Support Structure	OK	Inspected
Heaters & Thermostat	N/A	
Spare Fuse Quality	**POOR**	**No fuse found**
Spare Fuse Quantity	**POOR**	**No fuse found**

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**		**kV**	**GΩ**						
Contact Resistance	**@**	10	**A**	**μΩ**	1140	1109	1399			

Test Conditions	Outdoor
Results Satisfactory	**Poor**
Test Equipment	10A Microhmmter,

Notes:

Client Information

Customer	Rideau ST. Lawrence		**Date Tested**	12/08/2022	
File Number	22IM-5441	**Customer Ref.**	**Ambient Temp**	6	**°C**
Location	3039 John St. Cardinal		**Tested By**	CP	
Substation	Cardinal DS 2		**Approved By**	VG	
Equipment I.D.	33F4				

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C	**Max Voltage**	8.25	**kVolt**
Type	SM-5S	**Max Current**	400E	**Amps**
Style/Cat #	86641R2	**Serial #**		

Fuse Link Nameplate Data			
Type	SM-5S	**TCC**	N/A
Style/Cat #	N/A	**Amps**	300E

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated
Contact Surfaces	OK	Inspected, Greased and Cleaned
Contact Penetration	OK	Inspected, Greased and Cleaned
Contact Alignment	OK	Inspected, Greased and Cleaned
Expulsion-Limiting Filters	OK	Inspected
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	OK	Inspected
Support Structure	OK	Inspected
Heaters & Thermostat	OK	Inspected
Spare Fuse Quality	OK	4 Spare fuse
Spare Fuse Quantity	OK	4 Spare fuse

Electrical Tests										
Test Description				**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	**kV**	**GΩ**	40.5	116.2	137.6	210	306	327
Contact Resistance	**@**	**A**	**μΩ**	294	301	283			

Test Conditions	Outdoor
Results Satisfactory	Ok
Test Equipment	10kV Megohmmeter, 10A Microhmmter

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	12/08/2022	
File Number	22IM-5441	**Customer Ref.**		**Ambient Temp**	6	**°C**
Location	3039 John St. Cardinal			**Tested By**	CP	
Substation	Cardinal DS 2			**Approved By**	VG	
Equipment I.D.	33F5					

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C	**Max Voltage**	8.25	**kVolt**
Type	SM-5S	**Max Current**	400E	**Amps**
Style/Cat #	86641R2	**Serial #**		
Fuse Link Nameplate Data				
Type	SM-5S	**TCC**		
Style/Cat #		**Amps**	300E	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated
Contact Surfaces	OK	Inspected, Greased and Cleaned
Contact Penetration	OK	Inspected, Greased and Cleaned
Contact Alignment	OK	Inspected, Greased and Cleaned
Expulsion-Limiting Filters	OK	Inspected
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	OK	Inspected
Support Structure	OK	Inspected
Heaters & Thermostat	OK	Inspected
Spare Fuse Quality	OK	4 Spare fuse
Spare Fuse Quantity	OK	4 Spare fuse

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	5	**kV**	**GΩ**	90.5	116.2	137.6	210	396	327
Contact Resistance	**@**	10	**A**	**μΩ**	298	22	314			

Test Conditions	Outdoor
Results Satisfactory	OK
Test Equipment	10kV Megohmmter, 10A Microhmmter

Notes:

Client Information

Customer	Rideau ST. Lawrence			Date Tested	12/08/2022	
File Number	22IM-5441	Customer Ref.		Ambient Temp	6	°C
Location	3039 John St. Cardinal			Tested By	TR	
Substation	Cardinal DS 2			Approved By	VG	
Equipment I.D.	TX					

Power Transformer - Electrical

Nameplate Data

Manufacturer	Maloney Electric		Vector Group	DYn11	NGR		Solid	x
Year Built	1952		Serial #	149836	Res.		Ω	
Type	ONAN		Liquid Type/Volume	0.1	1453	gal.(US)		
Sealed		Conservator	Dry Type	Total Weight	39060	Kg.		
Rating	3000	kVA	Primary Voltage	44	kVolts			
Impedance	5.57	%	Secondary Voltage	4.16	Volts			
Phase	3	φ	BIL (Primary)	N/A	kV	BIL (Secondary)	N/A	kV
Oil Temp		°C	Max Oil Temp	°C	Winding Temp	°C	Max Winding Temp	°C

Insulation Resistance

Test Voltage	Hi		Low		kVdc	H to L + Grnd	L to H + Grnd	H to L	Core
GΩ @ °C						0.541	0.472	0.552	
Corrected to 20 °C						0.541	N/A	N/A	

Capacitance & Dissipation Factor

Test Voltage	High		Low		$C_{H-L} + C_{H-G}$	C_{H-G}	C_{H-L}	C_{L-G}	$C_{L-H} + C_{L-G}$
Capacitance (pF)					5.041	1.652	3.39	8.372	1.176
Current (mA)					0.019	0.006	0.013	0.006	0.009
Watts (W)					2.04	0.893	1.166	0.187	0.231
Power Factor					1.073	1.432	0.913	1.479	1.303
Corrected to 20 °C					N/A	N/A	N/A	N/A	N/A

Turns Ratio Test

Tap	Primary Volts	Calculated Ratio	H1-H2 X0-X1			H2-H3 X0-X2			H3-H1 X0-X3		
			Ratio	Dev%	mA	Ratio	Dev%	mA	Ratio	Dev%	mA
1											
2											
3	41800	10.0481	10.072	0.23	8.52	10.0718	0.23	6.56	10.728	0.24	7.02
4											
5											

Winding Resistance

Tap	Current Scale	Resistance Unit	H1-H2	H2-H3	H3-H1	X0-X1	X0-X2	X0-X3
3	5A/5A	Ω/mΩ	2.916	2.939	2.913	13.92	13.81	13.78

Tap Position Found & Left	3/3
Results Satisfactory	Pass
Test Equipment	Raytech TTR, Raytech WR

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	12/08/2022	
File Number	22IM-5441	**Customer Ref.**		**Ambient Temp**	6	**°C**
Location	3039 John St. Cardinal			**Tested By**	TR	
Substation	Cardinal DS 2			**Approved By**	VG	
Equipment I.D.	TX					

Power Transformer (Liquid Filled) - Mechanical

Mechanical Inspections						
Description of Inspection	**Status**				**Comments**	
	OK/FAIR/POOR/NA					
Breather & Silica Gel	N/A					
Conservator Tank Gaskets	OK				Inspected	
Explosion Vent Gaskets	OK				Inspected	
Inspection Cover Gaskets	OK				Inspected	
Main Cover Gaskets	OK				Inspected	
Primary Bushing Gaskets	OK				Inspected	
Primary Bushing Porcelain	OK				Inspected	
Primary Bushing Connections	OK				Inspected	
Primary Throat Gaskets	N/A					
Secondary Bushing Gaskets	OK				Inspected	
Secondary Bushing Porcelain	**POOR**				**X3 bushing cracked**	
Secondary Bushing Connections	OK				Inspected	
Secondary Throat Gaskets	N/A					
Pressure Relief Device	OK				Inspected	**PSI** N/A
Gas Relay	N/A					
Fan Operation	N/A					
Control Wiring	OK				Inspected	
Tap Changer	OK				Inspected	
Paint Condition	OK				Inspected	**Colour** Grey
Pads	OK				Inspected	
Grounding	OK				Inspected	
Radiator	OK				Inspected	
Oil Level	OK				Inspected	
Pressure Gauge	N/A					
Oil Temperature Gauge	OK				Inspected	
Winding Temperature Gauge	N/A					
Oil Temperature **Run | Max**	32	**°C**	N/A	**°C**		
Winding Temperature **Run | Max**	N/A	**°C**	N/A	**°C**		
Results Satisfactory	**Fair**					
Test Equipment	Visual					

Notes: Cracked Secondary Bushing. Recommend Repairs

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	12/08/2022
File Number	22IM-5441	**Customer Ref.**		**Ambient Temp**	6 °C
Location	3039 John St. Cardinal			**Tested By**	CP
Substation	Cardinal DS 2			**Approved By**	VG
Equipment I.D.	Station Metering				

Potential Transformer Ratio Test

Nameplate Data				
Manufacturer	General Electric	**Primary Voltage**	2.4	**kVolts**
Type	JVM-3	**B.I.L.**	60	**kVolts**
Style/Cat #	763X021033	**Accuracy**	CIE 60Hz 0.3W,X,M.Y	
In Use Ratio	20:01	**Available Ratio Taps**	N/A	

Electrical Tests				
Phase		**φ A**	**φ B**	**φ C**
Position				
Serial #		5646696	5646688	564692
Insulation Resistance (GΩ)				
Winding				
Winding Resistance (Ω)				
Winding		117.2	114.5	117.4
		0.7	0.6	0.7
Ratio & Polarity				
Winding	**Calc. Ratio**			
Polarity Confirmed:				

Test Conditions	Outdoor
Results Satisfactory	OK
Test Equipment	Fluke Digital Multimeter

Notes: Fuse Resistance A-1.9 , B-1.9, C-1.9

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	12/08/2022
File Number	22IM-5441	**Customer Ref.**		**Ambient Temp**	6 °C
Location	3039 John St. Cardinal			**Tested By**	CP
Substation	Cardinal DS 2			**Approved By**	VG
Equipment I.D.	Station Metering				

Current Transformer Ratio Test

Nameplate Data				
Manufacturer	General Electric	**C.T. Voltage Rating**	4.8	**kVolts**
Type	JKM-3	**B.I.L.**	60	**kVolts**
Style/Cat #	753X040039	**Accuracy**	CIE60Hz 0.3 B-01 TRVB-2:0	
In Use Ratio	9600:00:00	**Available Ratio Taps**	N/A	

Electrical Tests				
Phase		**φ A**	**φ B**	**φ C**
Position				
Serial #		6592750	6592752	6592751
Insulation Resistance (GΩ)				
Winding				
Winding Resistance (Ω)				
Winding				
Ratio & Polarity				
Winding	**Calc. Ratio**			
Polarity Confirmed				

Test Conditions	Outdoor
Results Satisfactory	Ok
Test Equipment	N/A

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	12/08/2022
File Number	22IM-5441	**Customer Ref.**		**Ambient Temp**	6 °C
Location	3039 John St. Cardinal			**Tested By**	AA/TR
Substation	Cardinal DS 2			**Approved By**	VG
Equipment I.D.	Tower Arrestors				

Lightning Arrester Inspection

Nameplate Data					
Manufacturer	Ohio Brass		**Voltage**	48	**kVolts**
Cat #	30039		**MCOV**	39	**kVolts**
Serial #			**Duty Cycle Rating**	48	**kVolts**

Capacitance and Power Factor Test

Insulation Tested	Test Mode	kV	Cap (pF)	Power factor Measured	Power factor Cor. to 20°C	mA	Watts
CH-G - Aϕ	GrndST						
CH-G - Bφ	GrndST						
CH-G - Cφ	GrndST						

Insulation Resistance (GΩ)

@ kVDC			
Ins. Type: Solid / Oil	φ A	φ B	φ C
Insulation Res. @ °C	5.2	4.5	5.5
Corrected to 20°C	N/A	N/A	N/A

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Insulator Surface Condition	OK	Inspected
Connector Condition	OK	Inspected
Grounding	OK	Inspected
Support Structure	OK	Inspected

Test Conditions	Outdoor
Results Satisfactory	OK
Test Equipment	10kV Megohmmeter

Notes:

Client Information

Customer	Rideau ST. Lawrence		**Date Tested**	12/08/2022	
File Number	22IM-5441	**Customer Ref.**	**Ambient Temp**	6	**°C**
Location	3039 John St. Cardinal		**Tested By**	CP	
Substation	Cardinal DS 2		**Approved By**	VG	
Equipment I.D.	Main Switchgear				

Switchgear Assembly Inspection

Nameplate Data				
Manufacturer	S&C Electric	**Voltage**	4.16	**kVolts**
Type	Metal Clad SWGR	**Current**	600	**Amps**
Style/Cat #	CDT-591984	**B.I.L**	60	**kVolts**
Phase/Wire	3	**Serial #**		

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Identification / Warning Signs	OK	Inspected
Lightning Arresters	N/A	
Grounding	OK	Inspected
Bus Support Insulators	OK	Inspected
Bus Torque	OK	Inspected
Phase Barriers	OK	Inspected
Compartment Barriers	OK	Inspected
C.T. Wiring	OK	Inspected
P.T. Wiring	OK	Inspected
Indicating Meters	OK	Inspected
Control Wiring	OK	Inspected
Paint Condition	OK	Inspected
Mechanical Integrity of Enclosure	OK	Inspected
Heaters	OK	Inspected
Interior Dry	OK	Inspected

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	5	**kV**	**GΩ**	90.5	116.2	137.6	210	396	327
AC Hi-Pot	**@**		**kV**	**µA**						

Test Conditions	Outdoor
Results Satisfactory	OK
Test Equipment	10kV Megohmmeter

Notes:

Client Information

Customer	Rideau ST. Lawrence			Date Tested	12/08/2022	
File Number	22IM-5441	Customer Ref.		Ambient Temp	6	°C
Location	3039 John St. Cardinal			Tested By	CP	
Substation	Cardinal DS 2			Approved By	VG	
Equipment I.D.	TX Secondary Metering/33F4/33F5					

Power Cable Inspection

Nameplate Data				
Manufacturer	Canada wire	Voltage	4.16	kVolts
Insulation Type	XLPE/TRXLPE/TRXLPE	Ambient Temp	600	°C
Conductor Type	Copper	Humidity	60	%

Electrical Tests							
Feeder Identification	Cables Per φ	Insulation Resistance (GΩ)			Tested @ kV		
		Aφ	Bφ	Cφ	A/B	B/C	C/A
Tx Sec. Metering	1	90.5	116.2	137.6			
33F4	1	131.2	94.5	76.6			
33F5	1	48.8	44.7	33.1			

Test Conditions	Outdoor
Results Satisfactory	OK
Test Equipment	10kV Megohmmeter

Notes:

Oil Analysis

Rideau St. Lawrence

WEIDMANN

WEIDMANN ELECTRICAL TECHNOLOGY
919 FRASER DR. UNIT 13 + BURLINGTON, ON + L7L 4X8
905-632-8697 + 905-632-8698
WWW.WEIDMANN-ELECTRICAL.COM

TEST REPORT
01-7607371-690673-00

KPC Power Electrical Ltd	**Serial#:** 149836	**Mfr:** MOLONEY ELECTRIC	**Control#:** 7607371
395 WESTNEY RD S	**Location:** 3038 JOHN ST	**kV:** 44	**Order#:** 690673
	Equipment: TRANSFORMER	**kVA:** 3000	**Account:** 6541
AJAX , . L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1952	**Received:** 12/15/2022
ATTN: ELAINE OWEN	**Breathing:** SEAL	**Syringe ID:** 8006739	**Reported:** 01/06/2023
PO#: 22IM-5441	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID: CARDINAL MS2	**Fluid:** MIN **IMPGal:** 1453	**Sampled By:** CP	
Customer ID: T2L			

	Lab Control Number:	7607371
	Date Sampled:	12/08/2022
	Order Number:	690673
	Oil Temp:	5
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.38
ASTM	**Transformer Age (yrs):**	70
D-3612[1]	**Hydrogen (H2) (µL/L):**	31
	Methane (CH4) (µL/L):	5
	Ethane (C2H6) (µL/L):	3
	Ethylene (C2H4) (µL/L):	6
	Acetylene (C2H2) (µL/L):	<1
	Carbon Monoxide (CO) (µL/L):	186
	Carbon Dioxide (CO2) (µL/L):	2841
	Nitrogen (N2) (µL/L):	57701
	Oxygen (O2) (µL/L):	22142

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		**Gas Level Deltas(µL/L) (2 most recent samples)**		**Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)**	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	31	Normal (<= 40)				
Methane (CH4)	5	Normal (<= 20)				
Ethane (C2H6)	3	Normal (<= 15)				
Ethylene (C2H4)	6	Normal (<= 60)				
Acetylene (C2H2)	<1	Normal (<= 2)				
Carbon Monoxide (CO)	186	Normal (<= 500)				
Carbon Dioxide (CO2)	2841	Normal (<= 5500)				

DGA Diagnostics	**Roger's Ratio**	Diagnostic not applicable - Gas levels normal.
	Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
	Duval Pentagons	Diagnostic not applicable - Gas levels normal.
	Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
	DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
	Resampling Protocol	Routine Screening
	Weidmann Resampling Recommendation	Resample within 1 year.
Comment:		
General Oil Quality (GOQ)		

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by Weidmann Laboratory other than Primary Lab. 6. Weidmann Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: WEIDMANN Electrical Technology accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

KPC Power Electrical Ltd	**Serial#:** 149836	**Mfr:** MOLONEY ELECTRIC	**Control#:** 7607371
395 WESTNEY RD S	**Location:** 3038 JOHN ST	**kV:** 44	**Order#:** 690673
	Equipment: TRANSFORMER	**kVA:** 3000	**Account:** 6541
AJAX , . L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1952	**Received:** 12/15/2022
ATTN: ELAINE OWEN	**Breathing:** SEAL	**Syringe ID:** 8006739	**Reported:** 01/06/2023
PO#: 22IM-5441	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID: CARDINAL MS2	**Fluid:** MIN **IMPGal:** 1453	**Sampled By:** CP	
Customer ID: T2L			

		Lab Control Number:	7607371
		Date Sampled:	12/08/2022
		Order Number:	690673
		Oil Temp:	5
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	18
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	**23.01**
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	0.048
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L1.5
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS
			CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	55 (24 C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.8805

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Below limit for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).

Comment:

End of Test Report

Authorized By: ______________________
JANET KAROLAT
SUPV CHEMIST

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by Weidmann Laboratory other than Primary Lab. 6. Weidmann Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: WEIDMANN Electrical Technology accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

REPORT

Substation Maintenance
Iroquois Substation

Rideau St. Lawrence

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

January 3, 2024

Rideau St. Lawrence
985 Industrial Rd, Prescott,
ON K0E 1T0

Attention	**Darryl Reynolds**
Project	**Substation Maintenance**
Location	**5799 Carman Rd. Prescott**
Job #	**23IM-5445**

Dear Darryl,

K.P.C. Power Electrical Ltd. (KPC Power) has completed the Substation Maintenance and Repair program as requested at Iroquois Substation located at 5799 Carman Rd. Prescott on November 3, 2023.

Included in this report are the Observations, Recommendations and Test Results.

Please feel at liberty to contact our office should you have any questions or concerns. Thank you for the opportunity to have been of service.

Thank you,

Tim Robertshaw

Field Supervisor, Industrial Maintenance

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

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K.P.C. POWER ELECTRICAL LTD.
395 Westney Road S., Ajax ON L1S 6M6 **T** 905.683.6636 **(24-Hour Emergency Response)**
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A DIVISION OF KPC UTILITY SOLUTIONS GROUP

Observations & Recommendations

5799 Carman Rd. Prescott

Observations:

While conducting inspections of Transformer ‘T1’, KPC Technicians noted an oil leak from the oil level gauge and oil stains on the surface area of transformer. It was also noted that the transformer is running low on oil as shown on the gauge.

KPC Technicians cleaned the oil stains on the surface of the transformer and around the oil level gauge.

Recommendations:

It is our recommendation to keep monitoring the oil leak and refill the oil to the appropriate level to ensure sufficient insulation.

KPC Power

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Inspection Sheets

5799 Carman Rd. Prescott

Client Information

Customer	Rideau St Lawrence			**Date Tested**	4-Nov-23
File Number	23IM-5445	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	10 °C
Location	5799 Carman Rd. Prescott			**Tested By**	EA
Substation	Iroquios Station			**Approved By**	VG
Equipment I.D.	T1-L				

High Voltage Air/Load Break Switch

Nameplate Data

Manufacturer	Eastern Power Devices Ltd.	**Voltage**	46	**kVolt**
Type		**Current**	600	**Amps**
Style #		**B.I.L.**		**kVolt**
Cat #	681-0357	**Serial #**	60986	

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Cleaned, Operated and Inspeceted
Stationary Contact Surfaces	OK	Cleaned and Inspected
Moving Contact Surfaces	OK	Cleaned, Greased and Inspected
Arcing Contact Surfaces	N/A	
Contact Alignment	OK	Cleaned and Inspected
Arcing Interrupter	N/A	
Connector Condition	OK	Inspected
Insulator Condition	OK	Cleaned and Inspected
Phase Barrier Condition	N/A	
Grounding	OK	Inspected
Lightning Arrester	OK	Inspected, Cleaned and Tested
Gradient Mat	OK	Inspected
Key Interlock	OK	Inspected
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests

Test Description		φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance @ 10 **kV**	**GΩ**	293.9	286.6	322.3			
Contact Resistance @ 10 **A**	**μΩ**	130	204	155			
Arc Interrupter Resistance	**Ω**						

Test Conditions	Clear/Cold
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes:

Client Information

Customer	Rideau St Lawrence			**Date Tested**	4-Nov-23	
File Number	23IM-5445	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	10	**°C**
Location	5799 Carman Rd. Prescott			**Tested By**	EA/NA	
Substation	Iroquios Station			**Approved By**	VG	
Equipment I.D.	Iroquius T1 Power Fuse					

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C Electric	**Max Voltage**	46	**kVolt**
Type	BMD	**Max Current**	200	**Amps**
Style/Cat #	86705R1	**Serial #**		

Fuse Link Nameplate Data			
Type	S&C Electric	**TCC**	119-1
Style/Cat #	455100	**Amps**	100E

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated and Inspected
Contact Surfaces	OK	Cleaned, Greased and Inspected
Contact Penetration	OK	Cleaned and Inspected
Contact Alignment	OK	Inspected
Expulsion-Limiting Filters	N/A	
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Cleaned and Inspected
Phase Barrier Condition	N/A	
Support Structure	OK	Inspected
Heaters & Thermostat	N/A	
Spare Fuse Quality	OK	Inspected
Spare Fuse Quantity	OK	Inspected

Electrical Tests											
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	10	**kV**	**GΩ**	293.9	286.6	322.3			
Contact Resistance	**@**	10	**A**	**μΩ**	871	877	1140			

Test Conditions	Clear/Cold
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes:

Client Information

Customer	Rideau St Lawrence			Date Tested	4-Nov-23	
File Number	23IM-5445	Customer Ref.	Darryl Reynolds	Ambient Temp	10	°C
Location	5799 Carman Rd. Prescott			Tested By	EA/NA	
Substation	Iroquios Station			Approved By	VG	
Equipment I.D.	T1-L Lightning Arrester					

Lightning Arrester Inspection

Nameplate Data						
Manufacturer	Ohio Brass			Voltage	46	kVolts
Cat #	300039			MCOV	39	kVolts
Serial #	F41958	F5750	F67497	Duty Cycle Rating	48	kVolts

Capacitance and Power Factor Test							
				Power factor			
Insulation Tested	Test Mode	kV	Cap (pF)	Measured	Cor. to 20°C	mA	Watts
CH-G - Aϕ	GrndST						
CH-G - Bφ	GrndST						
CH-G - Cφ	GrndST						

Insulation Resistance (GΩ)			
@ 10 kVDC			
Ins. Type: X Solid / Oil	φ A	φ B	φ C
Insulation Res. @ 10 °C	0.8	153	225.2
Corrected to 20°C	0.504	96.39	141.876

Mechanical Inspections		
Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Insulator Surface Condition	OK	Cleaned and Inspected
Connector Condition	OK	Inspected
Grounding	OK	Inspected
Support Structure	OK	Inspected

Test Conditions	Outdoor/Cold
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER

Notes:

Client Information

Customer	Rideau St Lawrence			Date Tested	4-Nov-23	
File Number	23IM-5445	Customer Ref.	Darryl Reynolds	Ambient Temp	2	°C
Location	5799 Carman Rd. Prescott			Tested By	EA/NA	
Substation	Iroquios Station			Approved By	VG	
Equipment I.D.	Iroquois T1					

Power Transformer - Electrical

Nameplate Data

Manufacturer	Brown, Boveri & Cie		Vector Group	Dyn11	NGR		Solid	
Year Built	1953		Serial #	199	Res.		Ω	
Type	ONAN		Liquid Type/Volume	Mineral Oil	8500	L.		
Sealed		Conservator X, Dry Type	Total Weight	27100	Kg.			
Rating	3000	kVA	Primary Voltage	44	kVolts			
Impedance	5.4	%	Secondary Voltage	4.16	Volts			
Phase	3	φ	BIL (Primary)	kV	BIL (Secondary)	kV		
Oil Temp	°C	Max Oil Temp °C	Winding Temp	°C	Max Winding Temp	°C		

Insulation Resistance

Test Voltage: Hi 10, Low 1 kVdc	H to L + Grnd	L to H + Grnd	H to L	Core
GΩ @ 5 °C	1.8	1.2	1.1	
Corrected to 20 °C	0.648	0.432	0.396	

Capacitance & Dissipation Factor

Test Voltage: High 10, Low 1	$C_{H-L} + C_{H-G}$	C_{H-G}	C_{H-L}	C_{L-G}	$C_{L-H} + C_{L-G}$
Capacitance (pF)	7342.4	1918.6	5424.2	10138.8	4714.2
Current (mA)	27.69	7.24	20.45	7.64	3.56
Watts (W)	1759.82	508.27	1248.58	92.45	43.05
Power Factor	0.6356	0.7017	0.6107	0.6044	0.6053
Corrected to 20 °C	0.991536	1.094652	0.952692	0.942864	0.944268

Turns Ratio Test

Tap	Primary Volts	Calculated Ratio	H1-H2 X0-X1			H2-H3 X0-X2			H3-H1 X0-X3		
			Ratio	Dev%	mA	Ratio	Dev%	mA	Ratio	Dev%	mA
1	44000	5.2885	119.95	0	3.3	119.95	0	4.2	119.94	0	3.7
2											
3											
4											
5											

Winding Resistance

Tap	Current Scale	Resistance Unit	H1-H2	H2-H3	H3-H1	X0-X1	X0-X2	X0-X3
1	5A	Ω/mΩ	3.395	3.414	3.388	70.97	70.97	71.419

Tap Position Found & Left	1/1 Outdoor/Clear
Results Satisfactory	OK
Test Equipment	TTR Tester/WR Tester/10kV MEGOHMMETER

Notes: Power Cable T1 Supply: Aφ = 307.8GΩ, Bφ = 173.5GΩ & Cφ = 297GΩ

Client Information

Customer	Rideau St Lawrence			**Date Tested**	4-Nov-23	
File Number	23IM-5445	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	2	**°C**
Location	5799 Carman Rd. Prescott			**Tested By**	EA/NA	
Substation	Iroquios Station			**Approved By**	VG	
Equipment I.D.	Iroquois T1					

Power Transformer (Liquid Filled) - Mechanical

Mechanical Inspections						
Description of Inspection		**Status**			**Comments**	
		OK/FAIR/POOR/NA				
Breather & Silica Gel		N/A				
Conservator Tank Gaskets		**POOR**			**Tank is out of oil. Indicator shows low.**	
Explosion Vent Gaskets		OK			Inspected	
Inspection Cover Gaskets		OK			Inspected	
Main Cover Gaskets		OK			Inspected	
Primary Bushing Gaskets		OK			Inspected	
Primary Bushing Porcelain		OK			Inspected	
Primary Bushing Connections		OK			Inspected	
Primary Throat Gaskets		OK			Inspected	
Secondary Bushing Gaskets		N/A				
Secondary Bushing Porcelain		N/A				
Secondary Bushing Connections		N/A				
Secondary Throat Gaskets		N/A				
Pressure Relief Device		**POOR**			**Oil leak**	**PSI**
Gas Relay		N/A				
Fan Operation		N/A				
Control Wiring		N/A				
Tap Changer		OK			Inspected	
Paint Condition		**POOR**			**Paint is covered with oil**	**Colour** **Grey**
Pads		OK			Inspected	
Grounding		OK			Inspected	
Radiator		OK			Inspected	
Oil Level		OK			Inspected	
Pressure Gauge		N/A				
Oil Temperature Gauge		N/A				
Winding Temperature Gauge		N/A				
Oil Temperature	**Run | Max**		**°C**		**°C**	
Winding Temperature	**Run | Max**		**°C**		**°C**	
Results Satisfactory		**POOR**				
Test Equipment		Visual				

Notes:

Client Information

Customer	Rideau St Lawrence			**Date Tested**	4-Nov-23
File Number	23IM-5445	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	10 °C
Location	5799 Carman Rd. Prescott			**Tested By**	EA
Substation	Iroquios Station			**Approved By**	VG
Equipment I.D.	T2-L				

High Voltage Air/Load Break Switch

Nameplate Data

Manufacturer	S&C Electric	**Voltage**	46	**kVolt**
Type	SMD-2C	**Current**	600	**Amps**
Style #		**B.I.L.**	250	**kVolt**
Cat #	145825R10-E	**Serial #**		

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Cleaned, Operated and Inspeceted
Stationary Contact Surfaces	OK	Cleaned and Inspected
Moving Contact Surfaces	OK	Cleaned, Greased and Inspected
Arcing Contact Surfaces	N/A	
Contact Alignment	OK	Cleaned and Inspected
Arcing Interrupter	N/A	
Connector Condition	OK	Inspected
Insulator Condition	OK	Cleaned and Inspected
Phase Barrier Condition	N/A	
Grounding	OK	Inspected
Lightning Arrester	OK	Inspected, Cleaned and Tested
Gradient Mat	OK	Inspected
Key Interlock	OK	Inspected
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests

Test Description	Unit	φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance @ 10 **kV**	**GΩ**	116.7	132.5	202.1			
Contact Resistance @ 10 **A**	**μΩ**	265	170	123			
Arc Interrupter Resistance	**Ω**	OK	OK	OK			

Test Conditions	Clear/Cold
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes:

Client Information

Customer	Rideau St Lawrence			**Date Tested**	4-Nov-23	
File Number	23IM-5445	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	10	°C
Location	5799 Carman Rd. Prescott			**Tested By**	EA/NA	
Substation	Iroquios Station			**Approved By**	VG	
Equipment I.D.	Tower Fuse (T2-L)					

High Voltage Power Fuse

Fuse Holder Nameplate Data

Manufacturer	S&C Electric	**Max Voltage**	48.3	**kVolt**
Type	SMD-2C	**Max Current**	300	**Amps**
Style/Cat #	145825R10-5	**Serial #**		

Fuse Link Nameplate Data

Type		**TCC**	
Style/Cat #		**Amps**	

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated and Inspected
Contact Surfaces	OK	Cleaned, Greased and Inspected
Contact Penetration	OK	Cleaned and Inspected
Contact Alignment	OK	Inspected
Expulsion-Limiting Filters	N/A	
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Cleaned and Inspected
Phase Barrier Condition	N/A	
Support Structure	OK	Inspected
Heaters & Thermostat	N/A	
Spare Fuse Quality	OK	Inspected
Spare Fuse Quantity	OK	Inspected

Electrical Tests

Test Description					φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance	@	1	kV	GΩ	116.7	132.5	202.1			
Contact Resistance	@	10	A	μΩ	827	752	727			

Test Conditions	Clear/Cold
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes:

Client Information

Customer	Rideau St Lawrence			**Date Tested**	4-Nov-23
File Number	23IM-5445	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	10 °C
Location	5799 Carman Rd. Prescott			**Tested By**	EA/NA
Substation	Iroquios Station			**Approved By**	VG
Equipment I.D.	T2-L Lightning Arrester				

Lightning Arrester Inspection

Nameplate Data

Manufacturer	Ohio Brass			**Voltage**	44	**kVolts**
Cat #	300039			**MCOV**	39	**kVolts**
Serial #	U34586	U27048	U57543	**Duty Cycle Rating**	48	**kVolts**

Capacitance and Power Factor Test

Insulation Tested	**Test Mode**	**kV**	**Cap (pF)**	**Power factor Measured**	**Power factor Cor. to 20°C**	**mA**	**Watts**
CH-G - Aφ	**GrndST**						
CH-G - Bφ	**GrndST**						
CH-G - Cφ	**GrndST**						

Insulation Resistance (GΩ)

@ 10 kVDC	**φ A**	**φ B**	**φ C**
Ins. Type X **Solid** **Oil**			
Insulation Res. @ 10 °C	101.2	220.7	220
Corrected to 20°C	63.756	139.041	138.6

Mechanical Inspections

Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Insulator Surface Condition	OK	Cleaned and Inspected
Connector Condition	OK	Inspected
Grounding	OK	Inspected
Support Structure	OK	Inspected

Test Conditions	Outdoor/Cold
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER

Notes:

Client Information

Customer	Rideau St Lawrence			**Date Tested**	4-Nov-23
File Number	23IM-5445	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	5 °C
Location	5799 Carman Rd. Prescott			**Tested By**	EA/NA
Substation	Iroquios Station			**Approved By**	VG
Equipment I.D.	Iroquois T2				

Power Transformer - Electrical

Nameplate Data

Manufacturer	Northern Transformer		**Vector Group**	Dyn11	**NGR**	**Solid**
Year Built	2015		**Serial #**	15-2707	**Res.** Ω
Type	ONAN		**Liquid Type/Volume**	Mineral Oil	2810 **L.**
Sealed X	**Conservator**	**Dry Type**	**Total Weight**	10325	**Kg.**
Rating	3000	**kVA**	**Primary Voltage**	44	**kVolts**
Impedance	5.54	**%**	**Secondary Voltage**	8.32	**Volts**
Phase	3	**φ**	**BIL (Primary)**	**kV**	**BIL (Secondary)** **kV**
Oil Temp °C	**Max Oil Temp**	**°C**	**Winding Temp**	**°C**	**Max Winding Temp** **°C**

Insulation Resistance

Test Voltage Hi 10 Low 1 kVdc	**H to L + Grnd**	**L to H + Grnd**	**H to L**	**Core**
GΩ @ 5 °C	34.99	36.55	43.3	
Corrected to 20 °C	12.5964	13.158	15.588	

Capacitance & Dissipation Factor

Test Voltage High 10 Low 1	$C_{H-L} + C_{H-G}$	C_{H-G}	C_{H-L}	C_{L-G}	$C_{L-H} + C_{L-G}$
Capacitance (pF)	3843.9	1451.6	2392.8	5865.6	3470.1
Current (mA)	14.5	5.48	9.02	8.85	5.24
Watts (W)	447.13	218.4	227.62	115.01	72.32
Power Factor	0.3083	0.3983	0.2524	0.3249	0.3454
Corrected to 20 °C	0.484031	0.625331	0.396268	0.510093	0.542278

Turns Ratio Test

Tap	**Primary Volts**	**Calculated Ratio**	**H1-H2 X0-X1**			**H2-H3 X0-X2**			**H3-H1 X0-X3**		
			Ratio	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**
1	44000	5.2885	119.95	0	3.3	119.95	0	4.2	119.94	0	3.7
2											
3											
4											
5											

Winding Resistance

Tap	**Current Scale**	**Resistance Unit**	**H1-H2**	**H2-H3**	**H3-H1**	**X0-X1**	**X0-X2**	**X0-X3**
1	5A	Ω/mΩ	3.395	3.414	3.388	70.97	70.97	71.419

Tap Position Found & Left	1/1 Outdoor/Clear
Results Satisfactory	OK
Test Equipment	TTR Tester/WR Tester/10kV MEGOHMMETER

Notes: Cable Test T2: Aφ = 140.8GΩ, Bφ = 201.9GΩ & Cφ = 313.9GΩ

Client Information

Customer	Rideau St Lawrence			**Date Tested**	4-Nov-23	
File Number	23IM-5445	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	2	**°C**
Location	5799 Carman Rd. Prescott			**Tested By**	EA/NA	
Substation	Iroquios Station			**Approved By**	VG	
Equipment I.D.	Iroquois T2					

Power Transformer (Liquid Filled) - Mechanical

Mechanical Inspections						
Description of Inspection		**Status**				**Comments**
		OK/FAIR/POOR/NA				
Breather & Silica Gel		N/A				
Conservator Tank Gaskets		N/A				
Explosion Vent Gaskets		N/A				
Inspection Cover Gaskets		OK				Inspected
Main Cover Gaskets		OK				Inspected
Primary Bushing Gaskets		OK				Inspected
Primary Bushing Porcelain		OK				Inspected
Primary Bushing Connections		OK				Inspected
Primary Throat Gaskets		OK				Inspected
Secondary Bushing Gaskets		OK				
Secondary Bushing Porcelain		OK				
Secondary Bushing Connections		OK				
Secondary Throat Gaskets		OK				
Pressure Relief Device		OK				**PSI**
Gas Relay		N/A				
Fan Operation		N/A				
Control Wiring		N/A				
Tap Changer		OK				Inspected
Paint Condition		OK				**Colour** Grey
Pads		OK				Inspected
Grounding		OK				Inspected
Radiator		OK				Inspected
Oil Level		OK				Inspected
Pressure Gauge		N/A				
Oil Temperature Gauge		N/A				
Winding Temperature Gauge		N/A				
Oil Temperature	**Run | Max**		**°C**		**°C**	
Winding Temperature	**Run | Max**		**°C**		**°C**	
Results Satisfactory		OK				
Test Equipment		Visual				

Notes:

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

REPORT

Substation Maintenance
11 Fifth St E, Morrisburg, ON

Rideau St. Lawrence Utilities (RSL)

January 16, 2025

Rideau St. Lawrence Utilities (RSL)
11 Fifth St E, Morrisburg,
ON K9A 1X0

Attention	**Joe Kramaric**
Project	**Substation Maintenance**
Location	**11 Fifth St E, Morrisburg, ON**
Job #	**24IM-5523**

Dear Joe,

K.P.C. Power Electrical Ltd. (KPC Power) has completed the Substation Maintenance program as requested at Rideau St. Lawrence Utilities (RSL) located at 11 Fifth St E, Morrisburg on October 10, 2024.

Included in this report are the Observations, Recommendations and Test Results.

Please feel at liberty to contact our office should you have any questions or concerns.

Thank you for the opportunity to have been of service.

Thank you,

Cameron Parkinson
Team Lead, Substations

KPC Power
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kpcpower.com

KPC Power

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Observations & Recommendations

11 Fifth St E, Morrisburg, ON

Observation:

While conducting inspections of the Primary Switch, KPC Technicians noted that the contact resistances on ‘A’ and ‘B’ Phases were higher.

Recommendation:

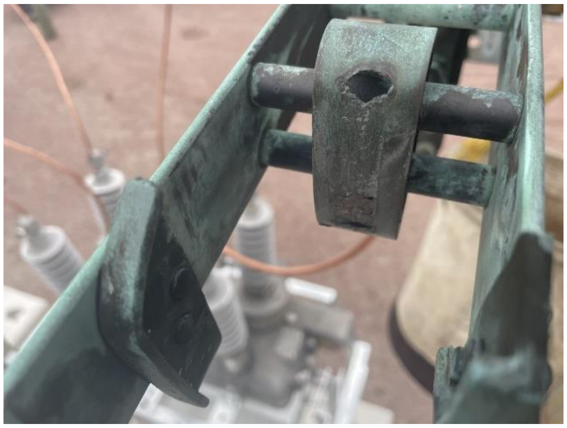
Continue to monitor/perform infrared scanning of the main load break switch to ensure there is no hot spots present on the switch contacts.

Observation:

When performing contact resistance testing of the 46kV primary fusing, it was noted that the ‘C’ phase fuse had a contact resistance that was 50x higher than the other 2 phases.

Actions:

KPC Technicians changed out the fuse link with a spare provided by RSL staff during the maintenance.

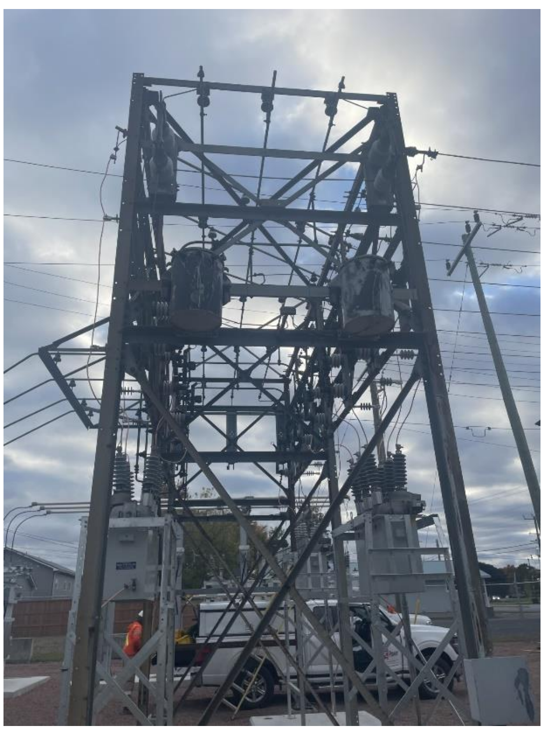


Observation:

While conducting inspections of the feeder line switches it was noted that the red phase of the 46 F1 switch and the 46 F2 switch has damaged arcing contact surface is poor.

Recommendation:

It is recommended to replaced the damaged arcing contact surfaces.



Observation:

While conducting inspections of the 46 F3 switch, KPC Technicians noted No continuity on 'A', 'B', or 'C' phase arc interrupters.

Recommendation:

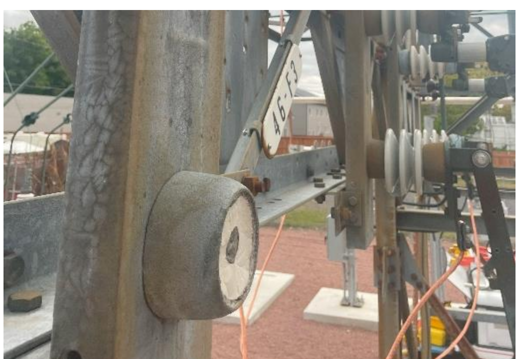
All arc interrupters on the 46F3 feeder line switches should be replaced.

Observation:

While conducting inspections of the 46-F3 reclosure, KPC Technicians noted the bushing on ‘C’ phase load side is cracked/damaged. During the time of the maintenance, insulation resistance was found to be satisfactory.

Recommendation:

To prevent moisture intrusion in the cracked portion of the bushing, it is recommended to seal the crack with an insulating paint until the damaged bushing can be replaced.



Observation:

When performing maintenance on the 46-F3 line switches, it was noted that the line side of the red phase switch was completely broken, and the load side had a very large crack in the insulator.

Actions:

KPC Technicians replaced both of the damaged insulators during the substation maintenance.

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

Inspection Sheets

11 Fifth St E, Morrisburg, ON

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)		**Date Tested**	10-Oct-24	
File Number	**24IM-5523**	**Customer Ref.**	**Ambient Temp**	11	**°C**
Location	11 Fifth St E, Morrisburg, ON		**Tested By**	CP	
Substation	MS-1		**Approved By**	AN	
Equipment I.D.	Substation Yard				

Substation Yard General Inspection

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Tower Structure	OK	Inspected
Metal Enclosed Switchgear	N/A	
Identification Signs	OK	Inspected
Warning Signs	OK	Inspected
Yard Debris	OK	Inspected
Weed Control	OK	Inspected
Ground Connections on Tower	OK	Inspected
Ground Connections on Switchgear	OK	Inspected
Ground Connections on Fence	OK	Inspected
Ground Connections on Gates	OK	Inspected
Ground Connections on Arresters	OK	Inspected
Ground Connections on Transformer(s)	OK	Inspected
Ground Grid + Rods Intact	OK	Inspected
Gradient Mat	OK	Inspected
Fence Assembly	OK	Inspected
Barbed Wire	OK	Inspected
Crushed Stone Depth	OK	Inspected

Lightning Arresters				
Manufacturer		**Voltage**		**kVolts**
Type/Cat #		**MCOV**		**kVolts**

Electrical Tests			
Test Description			
Ground Resistance	**Ω**		

Test Conditions	Outdoors
Results Satisfactory	OK
Test Equipment	Visual Inspection

Notes:

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24	
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11	**°C**
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP	
Substation	MS-1			**Approved By**	AN	
Equipment I.D.	Primary Fusing					

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C Electric	**Max Voltage**	46	**kVolt**
Type	SMD-1A	**Max Current**	150E	**Amps**
Style/Cat #	445150R1	**Serial #**		
Fuse Link Nameplate Data				
Type	SMD-1A	**TCC**	153	
Style/Cat #	445150R1	**Amps**	150E	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Contact Surfaces	OK	Greased, Cleaned and Inspected
Contact Penetration	OK	Cleaned and Inspected
Contact Alignment	OK	Cleaned and Inspected
Expulsion-Limiting Filters	N/A	
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	OK	Inspected
Support Structure	OK	Inspected
Heaters & Thermostat	OK	Inspected
Spare Fuse Quality	OK	Not stored on site
Spare Fuse Quantity	3	

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	10	**kV**	**GΩ**	51.3	78.4	71.3			
Contact Resistance	**@**	10	**A**	**μΩ**	910	914	924			

Test Conditions	Outdoors
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes: C' Phase fuse replaced due to high resistance. Test results are for the new fuse.

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)		**Date Tested**	10-Oct-24	
File Number	24IM-5523	**Customer Ref.**	**Ambient Temp**	11	**°C**
Location	11 Fifth St E, Morrisburg, ON		**Tested By**	CP	
Substation	MS-1		**Approved By**	AN	
Equipment I.D.	Primary 44kV LBS				

High Voltage Air/Load Break Switch

Nameplate Data				
Manufacturer	Eastern Power Devices LTD	**Voltage**	44	**µVolt**
Type	A	**Current**	600	**Amps**
Style #	-	**B.I.L.**		**kVolt**
Cat #	-	**Serial #**	55810	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Stationary Contact Surfaces	OK	Cleaned and Inspected
Moving Contact Surfaces	OK	Cleaned and Inspected
Arcing Contact Surfaces	OK	Cleaned and Inspected
Contact Alignment	OK	Inspected
Arcing Interrupter	OK	Inspected
Connector Condition	OK	Inspected
Insulator Condition	OK	Cleaned and Inspected
Phase Barrier Condition	N/A	
Grounding	OK	Inspected
Lightning Arrester	OK	Inspected
Gradient Mat	OK	Inspected
Key Interlock	N/A	Utility Lock
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	10	**kV**	**GΩ**	18.3	22.2	36.5			
Contact Resistance	**@**	10	**A**	**µΩ**	291	257	91			
Arc Interrupter Resistance				**Ω**						

Test Conditions	Outdoor/Overcast
Results Satisfactory	**FAIR**
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes: Higher contact resistance readings on 'A' and 'B' Phase. It is our recommendation to continue to monitor. Nameplate faded.

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			Date Tested	10-Oct-24	
File Number	24IM-5523	Customer Ref.		Ambient Temp	11	°C
Location	11 Fifth St E, Morrisburg, ON			Tested By	CP	
Substation	MS-1			Approved By	AN	
Equipment I.D.	Primary Arrestors					

Lightning Arrester Inspection

Nameplate Data						
Manufacturer	ASEA			Voltage	39	kVolts
Cat #	XBC 39			MCOV	10	kVolts
Serial #	5249872	5245234	3230681	Duty Cycle Rating		kVolts

Capacitance and Power Factor Test							
				Power factor			
Insulation Tested	Test Mode	kV	Cap (pF)	Measured	Cor. to 20°C	mA	Watts
$C_{H\text{-}G}$ - Aϕ	GrndST						
$C_{H\text{-}G}$ - Bφ	GrndST						
$C_{H\text{-}G}$ - Cφ	GrndST						

Insulation Resistance (GΩ)			
@ 10 kVDC			
Ins. Type: X Solid / Oil	φ A	φ B	φ C
Insulation Res. @ 10 °C	9.6	9.71	11.11
Corrected to 20°C	3.84	3.884	4.444

Mechanical Inspections		
Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Insulator Surface Condition	OK	Cleaned and Inspected
Connector Condition	OK	Cleaned and Inspected
Grounding	OK	Inspected
Support Structure	OK	Inspected

Test Conditions	Isolated
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER

Notes:

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11 °C
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	SP
Substation	MS-1			**Approved By**	AN
Equipment I.D.	Main Tx				

Power Transformer - Electrical

Nameplate Data

Manufacturer	Porter	**Vector Group**	Dyn11	**NGR**		**Solid** X
Year Built	1976	**Serial #**	22201-1	**Res.**		**Ω**
Type	ONAN	**Liquid Type/Volume**	Mineral Oil	10182		**L.**
Sealed X	**Conservator** / **Dry Type**	**Total Weight**	39300	**lbs.**		
Rating	5000 **kVA**	**Primary Voltage**	44	**kVolts**		
Impedance	5.87 **%**	**Secondary Voltage**	4160	**Volts**		
Phase	3 **φ**	**BIL (Primary)**	250 **kV**	**BIL (Secondary)**	95 **kV**	
Oil Temp	13 **°C**	**Max Oil Temp** 50 **°C**	**Winding Temp** **°C**	**Max Winding Temp** **°C**		

Insulation Resistance

Test Voltage Hi 10 Low 2.5 kVdc	**H to L + Grnd**	**L to H + Grnd**	**H to L**	**Core**
GΩ @ 10 °C	47.4	7.81	52	
Corrected to 20 °C	23.7	3.905	26	

Capacitance & Dissipation Factor

Test Voltage High / Low	**C_{H-L} + C_{H-G}**	**C_{H-G}**	**C_{H-L}**	**C_{L-G}**	**C_{L-H} + C_{L-G}**
Capacitance (pF)					
Current (mA)					
Watts (W)					
Power Factor					
Corrected to 20 °C					

Turns Ratio Test

Tap	**Primary Volts**	**Calculated Ratio**	**H1-H2 X0-X1**			**H2-H3 X0-X2**			**H3-H1 X0-X3**		
			Ratio	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**
1	44000										
2	42900	17.8617	17.874	0.07	2.5	17.874	0.07	2.7	17.873	0.06	2
3	41800										
4	40700										
5	39600										

Winding Resistance

Tap	**Current Scale**	**Resistance Unit**	**H1-H2**	**H2-H3**	**H3-H1**	**X0-X1**	**X0-X2**	**X0-X3**
2	5A/10A	Ω/mΩ	1.5625	1.5392	1.5336	6.773	6.8065	6.8345

Tap Position Found & Left	2/2
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER / Transformer Turn Ratio Tester / Winding Resistance Meter

Notes:

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24	
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11	**°C**
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP	
Substation	MS-1			**Approved By**	AN	
Equipment I.D.	Main Tx					

Power Transformer (Liquid Filled) - Mechanical

Mechanical Inspections						
Description of Inspection		**Status**				**Comments**
		OK/FAIR/POOR/NA				
Breather & Silica Gel		N/A				
Conservator Tank Gaskets		N/A				
Explosion Vent Gaskets		N/A				
Inspection Cover Gaskets		N/A				
Main Cover Gaskets		OK				Inspected
Primary Bushing Gaskets		OK				Inspected
Primary Bushing Porcelain		OK				Inspected
Primary Bushing Connections		OK				Inspected
Primary Throat Gaskets		N/A				
Secondary Bushing Gaskets		OK				Inspected
Secondary Bushing Porcelain		OK				Inspected
Secondary Bushing Connections		OK				Inspected
Secondary Throat Gaskets		N/A				
Pressure Relief Device		N/A				**PSI**
Gas Relay		N/A				
Fan Operation		N/A				
Control Wiring		OK				Inspected
Tap Changer		OK				Tap position 2
Paint Condition		**FAIR**				**Rusted top, conduit, control box** — **Colour** Grey
Pads		OK				Inspected
Grounding		OK				Inspected
Radiator		OK				Inspected
Oil Level		OK				Inspected
Pressure Gauge		N/A				
Oil Temperature Gauge		OK				Inspected
Winding Temperature Gauge		N/A				
Oil Temperature	**Run | Max**	13	**°C**	50	**°C**	
Winding Temperature	**Run | Max**		**°C**		**°C**	
Results Satisfactory		**FAIR**				
Test Equipment		Visual Inspection				

Notes: KPC Technicians noted there is rust on the top of the main transformer, the conduit and the control box.

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11 °C
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP
Substation	MS-1			**Approved By**	AN
Equipment I.D.	Secondary Arrestors				

Lightning Arrester Inspection

Nameplate Data

Manufacturer	ASEA			**Voltage**	39	**kVolts**
Cat #	XBC 39			**Class**	10	**kA**
Serial #	5250651	5245234	5249872	**Duty Cycle Rating**		**kVolts**

Capacitance and Power Factor Test

Insulation Tested	**Test Mode**	**kV**	**Cap (pF)**	**Power factor Measured**	**Power factor Cor. to 20°C**	**mA**	**Watts**
CH-G - Aφ	**GrndST**						
CH-G - Bφ	**GrndST**						
CH-G - Cφ	**GrndST**						

Insulation Resistance (GΩ)

@ 10 kVDC			
Ins. Type X **Solid** **Oil**	**φ A**	**φ B**	**φ C**
Insulation Res. @ 10 °C	100.6	120.3	111.3
Corrected to 20°C	40.24	48.12	44.52

Mechanical Inspections

Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Insulator Surface Condition	OK	Cleaned and Inspected
Connector Condition	OK	Cleaned and Inspected
Grounding	OK	Inspected
Support Structure	OK	Inspected

Test Conditions	Isolated
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER

Notes:

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11 °C
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP
Substation	MS-1			**Approved By**	AN
Equipment I.D.	46F1				

High Voltage Recloser

Nameplate Data				
Manufacturer	Kyle Recloser	**Voltage**	27	**kVolts**
Type	WV-27	**Current**	400	**Amps**
Style/Cat #	-	**Interrupting Cap.**	8000	**Amps**
Serial #'s	CP571125138	**B.I.L.**	150/110	**kVolts**
No. of Operations	-	**Oil Volume**	-	**gal.(US)**

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated and Inspected
Stationary Contact Surfaces	N/A	Internal
Moving Contact Surfaces	N/A	Internal
Arcing Contact Surfaces	N/A	Internal
Contact Alignment	N/A	Internal
Arc Chutes	N/A	Internal
Closing Solenoid	N/A	Reclosure requires Line Voltage to operate
Phase Barrier Condition	N/A	
Bushings	OK	Cleaned and Inspected
Connections & Terminals	OK	Cleaned, Torqued and Inspected
Tank & Head Casting Condition	OK	Inspected
Grounding	OK	Inspected
O-Ring Gasket	OK	Inspected
Oil Leaks	OK	Inspected
Lifting Strap	OK	Inspected

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	5	**kV**	**GΩ**	243	33.87	33.32	340	365	
Open Insulation Res.	**@**	5	**kV**	**GΩ**	387	228	226			
Contact Resistance	**@**		**A**	**µΩ**						

Test Conditions	Isolated
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes:

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24	
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11	**°C**
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP	
Substation	MS-1			**Approved By**	AN	
Equipment I.D.	46F2					

High Voltage Recloser

Nameplate Data				
Manufacturer	Kyle Recloser	**Voltage**	15.5	**kVolts**
Type	WV-27	**Current**	400	**Amps**
Style/Cat #	-	**Interrupting Cap.**	12000	**Amps**
Serial #'s	01426UF2	**B.I.L.**	110	**kVolts**
No. of Operations	-	**Oil Volume**	-	**gal.(US)**

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated and Inspected
Stationary Contact Surfaces	N/A	Internal
Moving Contact Surfaces	N/A	Internal
Arcing Contact Surfaces	N/A	Internal
Contact Alignment	N/A	Internal
Arc Chutes	N/A	Internal
Closing Solenoid	N/A	Reclosure requires Line Voltage to operate
Phase Barrier Condition	N/A	
Bushings	OK	Cleaned, Inspected
Connections & Terminals	OK	Cleaned, Torqued and Inspected
Tank & Head Casting Condition	OK	Inspected
Grounding	OK	Inspected
O-Ring Gasket	OK	Inspected
Oil Leaks	OK	Inspected
Lifting Strap	OK	Inspected

Electrical Tests											
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	5	**kV**	**GΩ**	180	16.66	17.82	361.7	333.1	301.8
Open Insulation Res.	**@**	5	**kV**	**GΩ**	608	374	402.8			
Contact Resistance	**@**		**A**	**μΩ**	-	-	-			

Test Conditions	Isolated
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24	
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11	**°C**
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP	
Substation	MS-1			**Approved By**	AN	
Equipment I.D.	46F3					

High Voltage Recloser

Nameplate Data

Manufacturer	Kyle Recloser	**Voltage**	27	**kVolts**
Type	WV-27	**Current**	400	**Amps**
Style/Cat #	-	**Interrupting Cap.**	8000	**Amps**
Serial #'s	CP571006418	**B.I.L.**	150	**kVolts**
No. of Operations	-	**Oil Volume**	-	**gal.(US)**

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Stationary Contact Surfaces	OK	Inspected
Moving Contact Surfaces	OK	Inspected
Arcing Contact Surfaces	OK	Inspected
Contact Alignment	OK	Inspected
Arc Chutes	N/A	
Closing Solenoid	N/A	
Phase Barrier Condition	N/A	
Bushings	**POOR**	**Damaged load side 'C' phase bushing**
Connections & Terminals	OK	Cleaned, Torqued and Inspected
Tank & Head Casting Condition	OK	Inspected
Grounding	OK	Inspected
O-Ring Gasket	OK	Inspected
Oil Leaks	OK	Inspected
Lifting Strap	OK	Inspected

Electrical Tests

Test Description					φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance	**@**	10	**kV**	**GΩ**	176.2	206.3	235.8	343.7	372.8	263.9
Open Insulation Res.	**@**	10	**kV**	**GΩ**	610	732	595			
Contact Resistance	**@**		**A**	**µΩ**	-	-	-			

Test Conditions	Isolated
Results Satisfactory	**POOR**
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11 °C
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP
Substation	MS-1			**Approved By**	AN
Equipment I.D.	46 F1				

High Voltage Air/Load Break Switch

Nameplate Data				
Manufacturer	S&C Electric	**Voltage**	7.2	**kVolt**
Type	Load Interrupter	**Current**	600	**Amps**
Style #	-	**B.I.L.**	85	**kVolt**
Cat #	36011	**Serial #**	-	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Stationary Contact Surfaces	OK	Cleaned and Inspected
Moving Contact Surfaces	OK	Cleaned and Inspected
Arcing Contact Surfaces	**POOR**	**Damaged red phase arcing contact surface**
Contact Alignment	OK	Inspected
Arcing Interrupter	OK	Inspected
Connector Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	N/A	
Grounding	OK	Inspected
Lightning Arrester	OK	Inspected
Gradient Mat	N/A	
Key Interlock	N/A	
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	OK	Inspected

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	10	**kV**	**GΩ**	340.3	365.9	278.1	243.1	33.87	36.32
Contact Resistance	**@**	10	**A**	**μΩ**	387.1	228.3	226.7			
Arc Interrupter Resistance				**Ω**	91	86	84			

Test Conditions	Outdoor/Overcast
Results Satisfactory	**POOR**
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11 °C
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP
Substation	MS-1			**Approved By**	AN
Equipment I.D.	46 F2				

High Voltage Air/Load Break Switch

Nameplate Data				
Manufacturer	S&C Electric	**Voltage**	7.2	**kVolt**
Type	Load Interrupter	**Current**	600	**Amps**
Style #	-	**B.I.L.**	85	**kVolt**
Cat #	36011	**Serial #**	-	

Mechanical Inspections

Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Stationary Contact Surfaces	OK	Cleaned and Inspected
Moving Contact Surfaces	OK	Cleaned and Inspected
Arcing Contact Surfaces	OK	Cleaned and Inspected
Contact Alignment	OK	Inspected
Arcing Interrupter	POOR	**Damaged red phase arcing contact surface**
Connector Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	N/A	
Grounding	OK	Inspected
Lightning Arrester	OK	Inspected
Gradient Mat	N/A	
Key Interlock	N/A	
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests

Test Description		**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance @ 10 kV	**GΩ**	180.4	16.66	17.82	361.7	333.1	301.8
Contact Resistance @ 10 A	**μΩ**	608	374.5	402.8			
Arc Interrupter Resistance	**Ω**	79	93	83			

Test Conditions	Outdoor/Overcast
Results Satisfactory	**POOR**
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24	
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11	**°C**
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP	
Substation	MS-1			**Approved By**	AN	
Equipment I.D.	46 F3					

High Voltage Air/Load Break Switch

Nameplate Data

Manufacturer	S&C Electric	**Voltage**	7.2	**kVolt**
Type	Load Interrupter	**Current**	600	**Amps**
Style #	-	**B.I.L.**	85	**kVolt**
Cat #	36011	**Serial #**	-	

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Stationary Contact Surfaces	OK	Cleaned and Inspected
Moving Contact Surfaces	OK	Cleaned and Inspected
Arcing Contact Surfaces	OK	Cleaned and Inspected
Contact Alignment	OK	Inspected
Arcing Interrupter	POOR	**No continuity on 'Red', 'B', or 'C' Phase**
Connector Condition	OK	Inspected
Insulator Condition	OK	Replaced 2x insulators.
Phase Barrier Condition	N/A	
Grounding	OK	Inspected
Lightning Arrester	OK	Inspected
Gradient Mat	OK	Inspected
Key Interlock	N/A	
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests

Test Description					φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance	@	5	kV	GΩ	176.2	206.3	235.8	343.7	372.8	263.9
Contact Resistance	@	10	A	μΩ	610	732	595			
Arc Interrupter Resistance				Ω	92	93	79			

Test Conditions	Outdoor/Overcast
Results Satisfactory	POOR
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11 °C
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP
Substation	MS-1			**Approved By**	AN
Equipment I.D.	Secondary PTs				

Power Transformer - Electrical

Nameplate Data

Manufacturer	General Electric		**Vector Group**	Dyn11	**NGR**		**Solid** X
Year Built	-		**Serial #**	2696691	**Res.**	56	**Ω**
Type	1 PU Pole Mount		**Liquid Type/Volume**	Mineral Oil	10182		**L.**
Sealed X	**Conservator**	**Dry Type**	**Total Weight**	75			**lbs.**
Rating	3	**kVA**	**Primary Voltage**	2400			**kVolts**
Impedance	2.4	**%**	**Secondary Voltage**	120/210			**Volts**
Phase	1	**φ**	**BIL (Primary)**	kV	**BIL (Secondary)**		**kV**
Oil Temp °C	**Max Oil Temp**	°C	**Winding Temp**	°C	**Max Winding Temp**		°C

Insulation Resistance

Test Voltage Hi 2.5 Low 2.5 kVdc	**H to L + Grnd**	**L to H + Grnd**	**H to L**	**Core**
GΩ @ 15 °C	17.8	-	22.34	
Corrected to 20 °C	8.9	-	11.17	

Capacitance & Dissipation Factor

Test Voltage High Low	**C_{H-L} + C_{H-G}**	**C_{H-G}**	**C_{H-L}**	**C_{L-G}**	**C_{L-H} + C_{L-G}**
Capacitance (pF)					
Current (mA)					
Watts (W)					
Power Factor					
Corrected to 20 °C					

Turns Ratio Test

Tap	**Primary Volts**	**Calculated Ratio**	**H1-H2 X0-X1**			**H2-H3 X0-X2**			**H3-H1 X0-X3**		
			Ratio	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**
1											
2											
3											
4											
5											

Winding Resistance

Tap	**Current Scale**	**Resistance Unit**	**H1-H2**	**H2-H3**	**H3-H1**	**X0-X1**	**X0-X2**	**X0-X3**

Tap Position Found & Left	N/A
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER / Transformer Turn Ratio Tester / Winding Resistance Meter

Notes: Both transformers were tested together W/ H2 isolated from GND.

Client Information

Customer	Rideau St. Lawrence Utilities (RSL)			**Date Tested**	10-Oct-24	
File Number	24IM-5523	**Customer Ref.**		**Ambient Temp**	11	**°C**
Location	11 Fifth St E, Morrisburg, ON			**Tested By**	CP	
Substation	MS-1			**Approved By**	AN	
Equipment I.D.	Secondary PT					

Power Transformer (Liquid Filled) - Mechanical

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Breather & Silica Gel	N/A	
Conservator Tank Gaskets	N/A	
Explosion Vent Gaskets	N/A	
Inspection Cover Gaskets	N/A	
Main Cover Gaskets	OK	Inspected
Primary Bushing Gaskets	OK	Inspected
Primary Bushing Porcelain	OK	Inspected
Primary Bushing Connections	OK	Inspected
Primary Throat Gaskets	N/A	
Secondary Bushing Gaskets	OK	Inspected
Secondary Bushing Porcelain	OK	Inspected
Secondary Bushing Connections	OK	Inspected
Secondary Throat Gaskets	N/A	
Pressure Relief Device	N/A	**PSI** -
Gas Relay	N/A	
Fan Operation	N/A	
Control Wiring	OK	Inspected
Tap Changer	OK	Tap position 2
Paint Condition	FAIR	Rusting **Colour** Grey/Green
Pads	OK	Inspected
Grounding	OK	Inspected
Radiator	N/A	
Oil Level	N/A	
Pressure Gauge	N/A	
Oil Temperature Gauge	N/A	
Winding Temperature Gauge	N/A	
Oil Temperature **Run | Max**	°C °C	
Winding Temperature **Run | Max**	°C °C	

Results Satisfactory	FAIR
Test Equipment	Visual Inspection

Notes: Recommended to re-paint the transformers.

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

REPORT

2024 Substation Maintenance
101 Churchill Rd. Prescott

Rideau ST. Lawrence

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

January 8, 2025

Rideau ST. Lawrence
985 Industrial Rd, Prescott
ON K0E 1T0

Attention	**Joe Kramaric**
Project	**Substation Maintenance**
Location	**101 Churchill Rd. Prescott**
Job #	**24IM-5558**

Dear Joe,

K.P.C. Power Electrical Ltd. (KPC Power) has completed the Substation Maintenance program as requested at Rideau ST. Lawrence located at 101 Churchill Rd. Prescott on November 27, 2024.

Included in this report are the Observations, Recommendations and Test Results.

Please feel at liberty to contact our office should you have any questions or concerns.

Thank you for the opportunity to have been of service.

Thank you,

Ram Vellaichamy, C.E.T., M.E.
Field Supervisor, Industrial Maintenance Group

K.P.C. POWER ELECTRICAL LTD.
395 Westney Road S., Ajax ON L1S 6M6 **T** 905.683.6636 **(24-Hour Emergency Response)**
kpcpower.com

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KPC Power

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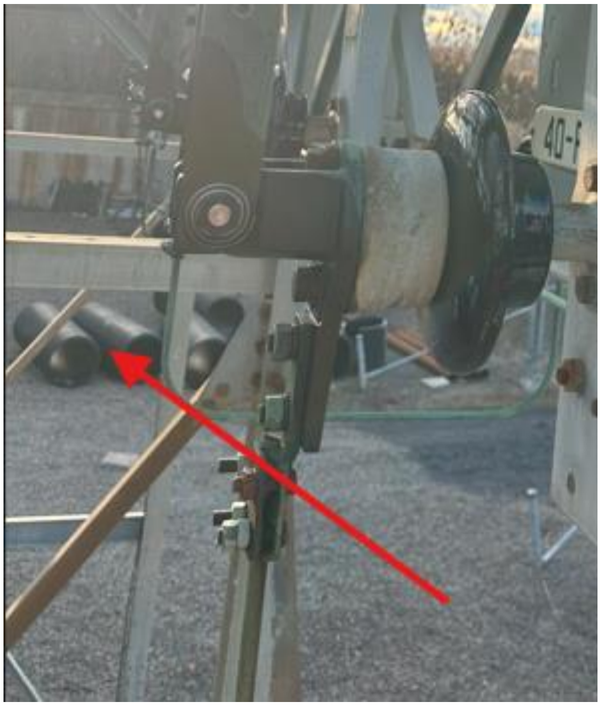
Observations & Recommendations

101 Churchill Rd. Prescott



Observation:

While conducting inspections of the Substation Yard, KPC Technicians noted that there was foreign material stored on site and part of the barbed wire was missing.

Recommendation:

It is our recommendation to replace the missing barbed wire.

It is also our recommendation to remove any foreign materials for safety.

Observation:

While conducting inspections of the Incoming Tower, KPC Technicians noted no spare fuses on site.

Recommendation:

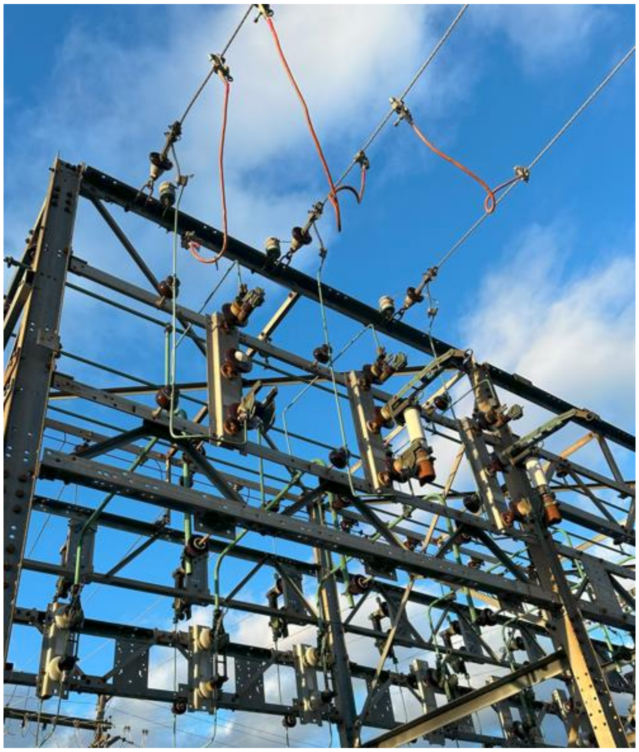
It is our recommendation to acquire a minimum of 3 spare fuses on site for emergency situations.

Observation:

While conducting inspections of the Transformer, KPC Technicians noted that the oil temperature gauge is not working and will not reset.

Recommendation:

It is our recommendation to replace the faulty temperature gauge.



Observation:

While conducting inspections of the High Voltage Switches, KPC Technicians noted issues on all 3 Switches (40-F3, 40-F2, 40-F1).

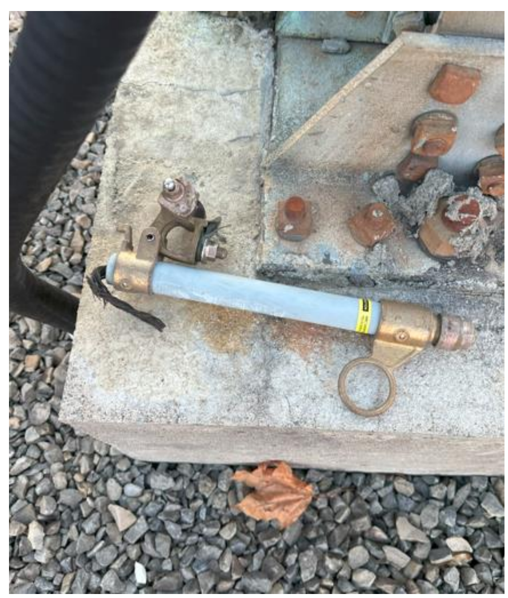
On 40-F3, KPC Technicians noted that the Arcing Interrupter has high resistance on 'A' phase, and no continuity on 'B' and 'C' phase.

On 40-F2, KPC Technicians noted no continuity on 'B' and 'C' phase.

On 40-F1, KPC Technicians noted no continuity on 'C' Phase.

Recommendation:

It is our recommendation to replace the faulty Arcing Interrupters.

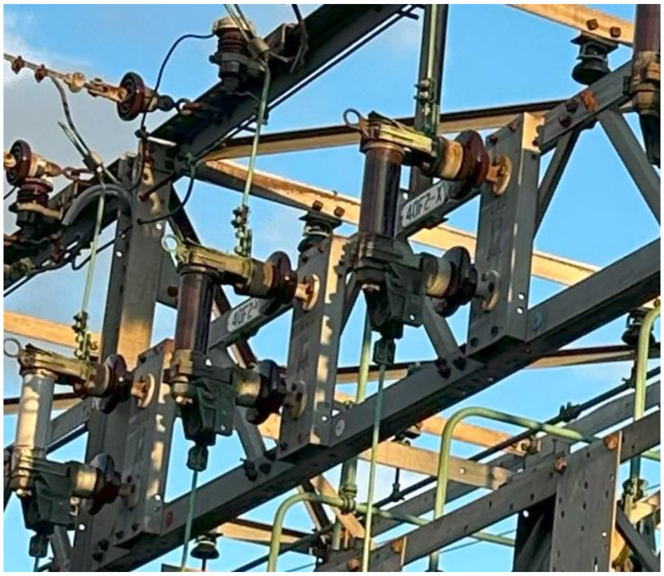


Observation:

While conducting inspections of the High Voltage Break Switches, KPC Technicians noted the contact surfaces on 40-F1 are deteriorating.

Recommendation:

It is our recommendation to replace the faulty contact surfaces on the one effected area.



Observation:

While conducting inspections of the High Voltage Power Fuses, KPC Technicians noted that on 40-F1-X, the phases were labelled incorrectly.

Recommendation:

It is our recommendation to Label the phases correctly.

Observation:

While conducting testing of the 40F1 and 40F2 Lightning Arresters, KPC Technicians noted low insulation resistance results.

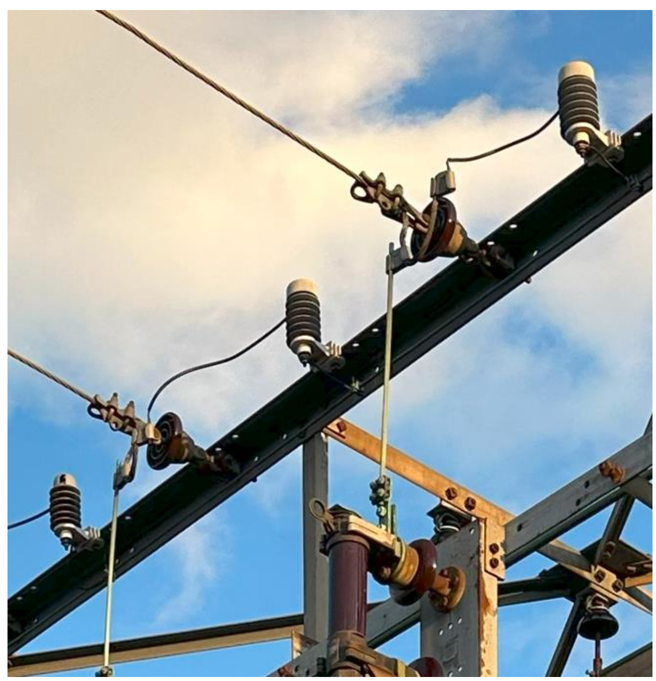
Recommendation:

It is our recommendation to replace the 6 old porcelain Lightning Arrestors with new non-fragmenting polymer arrestors.

40F1 Lightning Arrestors

40F2 Lightning Arrestors

40F3 Lightning Arrestors for Reference:

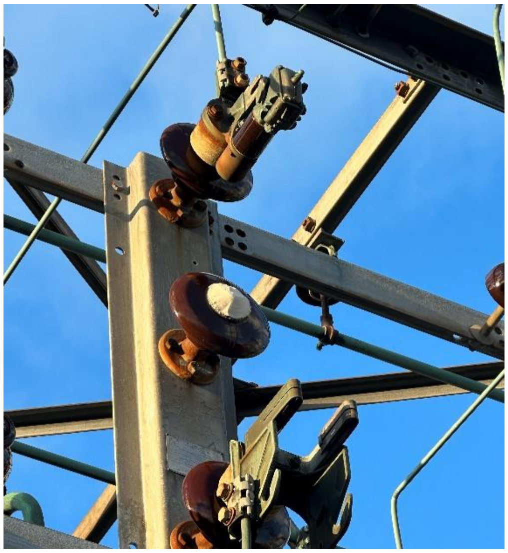


Observation:

During insulation resistance testing of the secondary bus, it was noted that there was very low insulation resistance on the red phase.

Actions/Recommendations:

KPC Technicians sectionalized the various insulators on the secondary bus to determine which was the cause of this poor insulation resistance. It was determined that the line side red phase of the 40F2 switch was yielding an insulation resistance value of 4Mohm when isolated from the bus. KPC Technicians removed the problem insulator and replaced it with one of the same voltage class/dimensions, provided by RSL staff. Once installed, the switch was re-tested to confirm satisfactory contact resistance, as well as insulation resistance on the bus, and with this new insulator installed from the bus, insulation resistance results increased from 4Mohm to 10.39Gohm



Observation:

It was noted that the tie switches between MS2/MS1 is presently broken and removed. As a result, KPC Technicians were unable to test this switch

Recommendations:

It is recommended to repair the switch for future use.

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Inspection Sheets

101 Churchill Rd. Prescott

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	5 °C
Location	101 Churchill Rd. Prescott			**Tested By**	RV
Substation	Main Substation MS 2			**Approved By**	VG
Equipment I.D.	Main Substaiton Yard				

Substation Yard General Inspection

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Tower Structure	OK	Inspected
Metal Enclosed Switchgear	N/A	
Identification Signs	OK	Inspected
Warning Signs	OK	Inspected
Yard Debris	**FAIR**	**Foreign material stored on site.**
Weed Control	OK	Inspected
Ground Connections on Tower	OK	Inspected
Ground Connections on Switchgear	N/A	
Ground Connections on Fence	OK	Inspected
Ground Connections on Gates	OK	Inspected
Ground Connections on Arresters	OK	Inspected
Ground Connections on Transformer(s)	OK	Inspected
Ground Grid + Rods Intact	OK	Inspected
Gradient Mat	OK	Inspected
Fence Assembly	OK	Inspected
Barbed Wire	**FAIR**	**Missing barbed wire on some part**
Crushed Stone Depth	OK	Inspected

Lightning Arresters				
Manufacturer	Ohio Brass	**Voltage**	44	**kVolts**
Type/Cat #	30039	**MCOV**	39	**kVolts**

Electrical Tests			
Test Description			
Ground Resistance	**Ω**		

Test Conditions	Outdoor
Results Satisfactory	**POOR**
Test Equipment	Visual

Notes: Foreign material stored on site. Missing barbed wire on some part of the fence. It is our recommendation to remove foreign materials from site and install barbed wire on missing areas.

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24	
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	5	°C
Location	101 Churchill Rd. Prescott			**Tested By**	MW	
Substation	Main Substation MS 2			**Approved By**	VG	
Equipment I.D.	Incoming Tower Fuses					

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C Electric	**Max Voltage**	46	**kVolt**
Type	Mounting Type	**Max Current**	200	**Amps**
Style/Cat #	186705R1	**Serial #**		
Fuse Link Nameplate Data				
Type	S&C Electric	**TCC**	153-1	
Style/Cat #	445080R1	**Amps**	80E	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated, Cleaned, Greased and Inspected
Contact Surfaces	OK	Cleaned and Inspected
Contact Penetration	OK	Cleaned, Greased and Inspected
Contact Alignment	OK	Inspected
Expulsion-Limiting Filters	N/A	
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	N/A	
Support Structure	OK	Inspected
Heaters & Thermostat	N/A	
Spare Fuse Quality	**POOR**	**No spare fuse found on site**
Spare Fuse Quantity	**POOR**	**No spare fuse found on site**

Electrical Tests											
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	10	**kV**	**GΩ**	238.7	367.9	272.5			
Contact Resistance	**@**	10	**A**	**μΩ**	71	71	70			

Test Conditions	Isolated
Results Satisfactory	**POOR**
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes: It is our recommendation to acquire a minimum of 3 spare fuses on site for emergency situations.

Client Information

Customer	Rideau ST. Lawrence			Date Tested	27-Nov-24	
File Number	24IM-5558	Customer Ref.	Darryl Reynolds	Ambient Temp	5	°C
Location	101 Churchill Rd. Prescott			Tested By	MW	
Substation	Main Substation MS 2			Approved By	VG	
Equipment I.D.	Tower					

High Voltage Air/Load Break Switch

Nameplate Data

Manufacturer	Canadian Line Material	Voltage	46	kVolt
Type	Delta Star Product	Current	600	Amps
Style #		B.I.L.		kVolt
Cat #	115452SP	Serial #		

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated, Lubricated and Inspected
Stationary Contact Surfaces	OK	Cleaned, Greased and Inspected
Moving Contact Surfaces	OK	Cleaned, Greased, Lubricated and Inspected
Arcing Contact Surfaces	OK	Cleaned, Greased and Inspected
Contact Alignment	OK	Cleaned and Inspected
Arcing Interrupter	N/A	
Connector Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	N/A	
Grounding	OK	Inspected
Lightning Arrester	OK	Tested and Inspected
Gradient Mat	OK	Inspected
Key Interlock	N/A	
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests

Test Description					φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance	@	10	kV	GΩ	238.7	367.9	272.5			
Contact Resistance	@	10	A	µΩ	211	219	190			
Arc Interrupter Resistance				Ω						

Test Conditions	Isolated
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	5 °C
Location	101 Churchill Rd. Prescott			**Tested By**	MW
Substation	Main Substation MS 2			**Approved By**	VG
Equipment I.D.	Tower Main L.A.s				

Lightning Arrester Inspection

Nameplate Data

Manufacturer	Ohio Brass			**Voltage**	44	**kVolts**
Cat #	30039			**MCOV**	39	**kVolts**
Serial #	M34602	M56874	M34603	**Duty Cycle Rating**	48	**kVolts**

Capacitance and Power Factor Test

Insulation Tested	**Test Mode**	**kV**	**Cap (pF)**	**Power factor Measured**	**Power factor Cor. to 20°C**	**mA**	**Watts**
CH-G - Aϕ	GrndST						
CH-G - Bφ	GrndST						
CH-G - Cφ	GrndST						

Insulation Resistance (GΩ)

@ 10 kVDC			
Ins. Type X Solid ☐ Oil	**φ A**	**φ B**	**φ C**
Insulation Res. @ 5 °C	272.5	253.2	126.7
Corrected to 20°C	136.25	126.6	63.35

Mechanical Inspections

Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Insulator Surface Condition	OK	Inspected
Connector Condition	OK	Inspected
Grounding	OK	Inspected
Support Structure	OK	Inspected

Test Conditions	Isolated
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	0 °C
Location	101 Churchill Rd. Prescott			**Tested By**	RV
Substation	Main Substation MS 2			**Approved By**	VG
Equipment I.D.	T1				

Power Transformer - Electrical

Nameplate Data

Manufacturer	Archer		**Vector Group**	Dyn1	**NGR**	**Solid**	x
Year Built	1963		**Serial #**		**Res.**		**Ω**
Type	ONAN		**Liquid Type/Volume**	Mineral Oil	870	**gal.(imp)**	
Sealed X	**Conservator**	**Dry Type**	**Total Weight**	28100	**lbs.**		
Rating	5000	**kVA**	**Primary Voltage**	44	**kVolts**		
Impedance	6.3	**%**	**Secondary Voltage**	4.16/2.4	**Volts**		
Phase	3	**φ**	**BIL (Primary)**	250 **kV**	**BIL (Secondary)**	25	**kV**
Oil Temp	0 **°C**	**Max Oil Temp** 60 **°C**	**Winding Temp**	**°C**	**Max Winding Temp**		**°C**

Insulation Resistance

Test Voltage **Hi** 10 **Low** 5 **kVdc**	**H to L + Grnd**	**L to H + Grnd**	**H to L**	**Core**
GΩ @ 5 °C	9.08	11.2	9.1	
Corrected to 20 °C	2.27	2.8	2.275	

Capacitance & Dissipation Factor

Test Voltage **High** 10 **Low** 5	**C_{H-L} + C_{H-G}**	**C_{H-G}**	**C_{H-L}**	**C_{L-G}**	**C_{L-H} + C_{L-G}**
Capacitance (pF)	7340.5	1776.9	5564.3	8454.3	14019.5
Current (mA)	27.68	6.71	20.98	31.88	52.86
Watts (W)	1299.9	480.42	841.77	2267.96	3179.5
Power Factor	0.467	0.7159	0.401	0.711	0.601
Corrected to 20 °C	0.73319	1.123963	0.62957	1.11627	0.94357

Turns Ratio Test

Tap	**Primary Volts**	**Calculated Ratio**	**H1-H2 X0-X2**			**H2-H3 X0-X3**			**H3-H1 X0-X1**		
			Ratio	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**
1											
2											
3	440000	17.8201	17.6232	-1.11	3.1	17.6298	-1.07	2.5	17.621	-1.12	2.05
4											
5											

Winding Resistance

Tap	**Current Scale**	**Resistance Unit**	**H1-H2**	**H2-H3**	**H3-H1**	**X0-X1**	**X0-X2**	**X0-X3**
3	5A/5A	Ω/mΩ	1.81	1.82	1.82	42.3	42.2	42.23

Tap Position Found & Left	3/3
Results Satisfactory	OK
Test Equipment	Testrano 600/ 10kV MEGOHMMETER

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	0 °C
Location	101 Churchill Rd. Prescott			**Tested By**	RV
Substation	Main Substation MS 2			**Approved By**	AN
Equipment I.D.	T1				

Power Transformer (Liquid Filled) - Mechanical

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Breather & Silica Gel	N/A	
Conservator Tank Gaskets	OK	Inspected
Explosion Vent Gaskets	OK	Inspected
Inspection Cover Gaskets	OK	Inspected
Main Cover Gaskets	OK	Inspected
Primary Bushing Gaskets	OK	Inspected
Primary Bushing Porcelain	OK	Cleaned and Inspected
Primary Bushing Connections	OK	Torqued and Inspected
Primary Throat Gaskets	N/A	
Secondary Bushing Gaskets	OK	Inspected
Secondary Bushing Porcelain	OK	Cleaned and Inspected
Secondary Bushing Connections	OK	Torqued and Inspected
Secondary Throat Gaskets	OK	Inspected
Pressure Relief Device	OK	Inspected — **PSI**
Gas Relay	N/A	
Fan Operation	N/A	
Control Wiring	N/A	
Tap Changer	OK	Inspected
Paint Condition	OK	Inspected — **Colour** Grey
Pads	OK	Inspected
Grounding	OK	Inspected
Radiator	OK	Inspected
Oil Level	OK	Inspected
Pressure Gauge	N/A	
Oil Temperature Gauge	**POOR**	**Will not reset**
Winding Temperature Gauge	N/A	
Oil Temperature — **Run | Max**	0 **°C** 60 **°C**	
Winding Temperature — **Run | Max**	**°C** **°C**	
Results Satisfactory	**POOR**	
Test Equipment	Visual	

Notes: Oil Temp gauge not working, will not reset.

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	0 °C
Location	101 Churchill Rd. Prescott			**Tested By**	CP
Substation	Main Substation MS 2			**Approved By**	VG
Equipment I.D.	40-F3				

High Voltage Air/Load Break Switch

Nameplate Data

Manufacturer	S&C Electric	**Voltage**	7.5	**kVolt**
Type	BS	**Current**	400	**Amps**
Style #		**B.I.L.**	95	**kVolt**
Cat #	36001	**Serial #**		

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Stationary Contact Surfaces	OK	Inspected
Moving Contact Surfaces	OK	Inspected
Arcing Contact Surfaces	OK	Inspected
Contact Alignment	OK	Inspected
Arcing Interrupter	POOR	High resistance on 'A' phase. No continuity on 'B' & 'C'.
Connector Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	N/A	
Grounding	OK	Inspected
Lightning Arrester	N/A	
Gradient Mat	N/A	
Key Interlock	N/A	
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests

Test Description		φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance @ 5 kV	MΩ	10.39	11.64	12.01			
Contact Resistance @ 10 A	μΩ	93	103	99			
Arc Interrupter Resistance	OK	OK	FAIL	FAIL			

Test Conditions	Outdoor/Clear
Results Satisfactory	POOR
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes: High resistance on 'A' phase. No continuity on 'B' & 'C'. It is our recommendation to replace the Arcing Interrupters.

Client Information

Customer	Rideau ST. Lawrence			Date Tested	27-Nov-24	
File Number	24IM-5558	Customer Ref.	Darryl Reynolds	Ambient Temp	0	°C
Location	101 Churchill Rd. Prescott			Tested By	CP	
Substation	Main Substation MS 2			Approved By	VG	
Equipment I.D.	40-F2					

High Voltage Air/Load Break Switch

Nameplate Data				
Manufacturer	S&C Electric	Voltage	7.5	kVolt
Type	BS	Current	400	Amps
Style #		B.I.L.	95	kVolt
Cat #	36001	Serial #		

Mechanical Inspections		
Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Stationary Contact Surfaces	OK	Inspected
Moving Contact Surfaces	OK	Inspected
Arcing Contact Surfaces	OK	Inspected
Contact Alignment	OK	Inspected
Arcing Interrupter	POOR	No continuity on 'B' & 'C'.
Connector Condition	OK	Inspected
Insulator Condition	FAIR	Older porcelian style, Replaced line side red phase insulator
Phase Barrier Condition	N/A	
Grounding	OK	Inspected
Lightning Arrester	N/A	
Gradient Mat	N/A	
Key Interlock	N/A	
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests										
Test Description					φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance	@	5	kV	MΩ	10.39	11.64	12.01			
Contact Resistance	@	10	A	µΩ	113	102	109			
Arc Interrupter Resistance				OK	OK	FAIL	FAIL			

Test Conditions	Outdoor/Clear
Results Satisfactory	POOR
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes: No continuity on 'B' & 'C'. It is our recommendation to replace the faulty Arcing Interrupters.
KPC Technicians replaced the load side switch support insulator during maintenance.

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24	
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	0	**°C**
Location	101 Churchill Rd. Prescott			**Tested By**	CP	
Substation	Main Substation MS 2			**Approved By**	VG	
Equipment I.D.	40-F1					

High Voltage Air/Load Break Switch

Nameplate Data				
Manufacturer	S&C Electric	**Voltage**	7.5	**kVolt**
Type	BS	**Current**	400	**Amps**
Style #		**B.I.L.**	95	**kVolt**
Cat #	36001	**Serial #**		

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Stationary Contact Surfaces	**FAIR**	**Stationary contact surfaces deteriorating.**
Moving Contact Surfaces	**FAIR**	**Signs of minor arcing damage on 'A' phase.**
Arcing Contact Surfaces	**POOR**	**Contact surface completely deteriorated.**
Contact Alignment	OK	Inspected
Arcing Interrupter	**POOR**	**No continuity on 'C' Phase.**
Connector Condition	OK	Inspected
Insulator Condition	**FAIR**	**Older porcelian style**
Phase Barrier Condition	N/A	
Grounding	OK	Inspected
Lightning Arrester	N/A	
Gradient Mat	N/A	
Key Interlock	N/A	
Heaters & Thermostat	N/A	
Support Structure Condition	OK	Inspected
Potential Indicators	N/A	

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**	5	**kV**	**MΩ**	10.39	11.69	12.01			
Contact Resistance	**@**	10	**A**	**µΩ**	89	102	88			
Arc Interrupter Resistance				**OK**	OK	OK	FAIL			

Test Conditions	Outdoor/Clear
Results Satisfactory	**POOR**
Test Equipment	10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes: No continuity on 'C' Phase. It is our recommendation to replace the faulty Arcing Interrupter.
Contact surfaces are deteriorating. It is our recommendation to replace the effected areas.

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	0 °C
Location	101 Churchill Rd. Prescott			**Tested By**	CP
Substation	Main Substation MS 2			**Approved By**	VG
Equipment I.D.	40 F1 - X				

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C Electric	**Max Voltage**	7.5	**kVolt**
Type	SMD-1	**Max Current**	400	**Amps**
Style/Cat #	86151	**Serial #**		

Fuse Link Nameplate Data			
Type	SMD-1	**TCC**	119-4
Style/Cat #	261600R4	**Amps**	400E

Mechanical Inspections

Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated and Inspected
Contact Surfaces	OK	Inspected, Greased and Cleaned
Contact Penetration	OK	Inspected, Greased and Cleaned
Contact Alignment	OK	Inspected, Greased and Cleaned
Expulsion-Limiting Filters	N/A	
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	N/A	
Support Structure	N/A	
Heaters & Thermostat	OK	Inspected
Spare Fuse Quality	OK	2 spare fuses on site
Spare Fuse Quantity	OK	2 spare fuses on site

Electrical Tests

Test Description						**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**		**kV**	**GΩ**		10.39	11.69	12.01			
Contact Resistance	**@**	10	**A**	**μΩ**		311	301	334			

Test Conditions	Outdoor/Clear
Results Satisfactory	FAIR
Test Equipment	10A MICRO-OHMMETER

Notes: It is our recommendation to acquire a minimum 3 spare fuses on site for emergency situations.
Phase labeled incorrectly on 40FX-1, Blue & White Phase indicator in wrong locations. Insulation resistance tested with common BUS.

Client Information

Customer	Rideau ST. Lawrence			Date Tested	27-Nov-24	
File Number	24IM-5558	Customer Ref.	Darryl Reynolds	Ambient Temp	0	°C
Location	101 Churchill Rd. Prescott			Tested By	CP	
Substation	Main Substation MS 2			Approved By	VG	
Equipment I.D.	40 F2 - X					

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C Electric	Max Voltage	7.5	kVolt
Type	SMD-1	Max Current	400	Amps
Style/Cat #	86151	Serial #		
Fuse Link Nameplate Data				
Type	SMD-1	TCC	119-4	
Style/Cat #	261600R4	Amps	400E	

Mechanical Inspections		
Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated and Inspected
Contact Surfaces	OK	Inspected, Greased and Cleaned
Contact Penetration	OK	Inspected, Greased and Cleaned
Contact Alignment	OK	Inspected, Greased and Cleaned
Expulsion-Limiting Filters	N/A	
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	N/A	
Support Structure	N/A	
Heaters & Thermostat	OK	Inspected
Spare Fuse Quality	OK	2 spare fuses on site
Spare Fuse Quantity	OK	2 spare fuses on site

Electrical Tests										
Test Description				φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance	@	kV	GΩ						
Contact Resistance	@ 10	A	μΩ	222	239	282			

Test Conditions	Outdoor/Clear
Results Satisfactory	OK
Test Equipment	10A MICRO-OHMMETER

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24	
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	0	**°C**
Location	101 Churchill Rd. Prescott			**Tested By**	CP	
Substation	Main Substation MS 2			**Approved By**	VG	
Equipment I.D.	40 F3 - X					

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	S&C Electric	**Max Voltage**	7.5	**kVolt**
Type	SMD-1	**Max Current**	400	**Amps**
Style/Cat #	86151	**Serial #**		
Fuse Link Nameplate Data				
Type	SMD-1	**TCC**	119-4	
Style/Cat #	261600R4	**Amps**	400E	

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Operated and Inspected
Contact Surfaces	OK	Inspected, Greased and Cleaned
Contact Penetration	OK	Inspected, Greased and Cleaned
Contact Alignment	OK	Inspected, Greased and Cleaned
Expulsion-Limiting Filters	N/A	
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Inspected
Phase Barrier Condition	N/A	
Support Structure	N/A	
Heaters & Thermostat	OK	Inspected
Spare Fuse Quality	OK	2 spare fuses on site
Spare Fuse Quantity	OK	2 spare fuses on site

Electrical Tests										
Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	**@**		**kV**	**GΩ**						
Contact Resistance	**@**	10	**A**	**μΩ**	477	440	250			

Test Conditions	Outdoor/Clear
Results Satisfactory	OK
Test Equipment	10A MICRO-OHMMETER

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	0 °C
Location	101 Churchill Rd. Prescott			**Tested By**	CP
Substation	Main Substation MS 2			**Approved By**	VG
Equipment I.D.	40 F3 - Arrestor				

Lightning Arrester Inspection

Nameplate Data

Manufacturer		**Voltage**	
Cat #		**MCOV**	kVolts
Serial #		**Duty Cycle Rating**	kVolts

Capacitance and Power Factor Test

Insulation Tested	Test Mode	kV	Cap (pF)	Power factor Measured	Power factor Cor. to 20°C	mA	Watts
CH-G - Aϕ	GrndST						
CH-G - Bφ	GrndST						
CH-G - Cφ	GrndST						

Insulation Resistance (Ω)

@ 2.5 kVDC	φ A	φ B	φ C
Ins. Type: X Solid / Oil			
Insulation Res. @ 0 °C	4.48	4.67	12.33
Corrected to 20°C	1.792	1.868	4.932

Mechanical Inspections

Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Insulator Surface Condition	OK	Inspected
Connector Condition	OK	Inspected
Grounding	OK	Inspected
Support Structure	OK	Inspected

Test Conditions	Outdoors/Disconnected
Results Satisfactory	OK
Test Equipment	10kV MEGOHMMETER

Notes: No Nameplate.

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	0 °C
Location	101 Churchill Rd. Prescott			**Tested By**	CP
Substation	Main Substation MS 2			**Approved By**	VG
Equipment I.D.	40 F2 - Arrestor				

Lightning Arrester Inspection

Nameplate Data

Manufacturer				**Voltage**		**kVolts**
Cat #				**MCOV**		**kVolts**
Serial #				**Duty Cycle Rating**		**kVolts**

Capacitance and Power Factor Test

Insulation Tested	**Test Mode**	**kV**	**Cap (pF)**	**Power factor Measured**	**Power factor Cor. to 20°C**	**mA**	**Watts**
CH-G - Aϕ	**GrndST**						
CH-G - Bφ	**GrndST**						
CH-G - Cφ	**GrndST**						

Insulation Resistance (mΩ)

@ 2.5 kVDC			
Ins. Type X **Solid** _ **Oil**	**φ A**	**φ B**	**φ C**
Insulation Res. @ 0 °C	562	301	293
Corrected to 20°C	224.8	120.4	117.2

Mechanical Inspections

Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Insulator Surface Condition	OK	Inspected
Connector Condition	OK	Inspected
Grounding	OK	Inspected
Support Structure	OK	Inspected

Test Conditions	Outdoors/Disconnected
Results Satisfactory	FAIR
Test Equipment	10kV MEGOHMMETER

Notes: No Nameplate. Older pocelain Lightning Arrestors.

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	27-Nov-24	
File Number	24IM-5558	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	0	**°C**
Location	101 Churchill Rd. Prescott			**Tested By**	CP	
Substation	Main Substation MS 2			**Approved By**	VG	
Equipment I.D.	40 F1 - Arrestor					

Lightning Arrester Inspection

Nameplate Data						
Manufacturer				**Voltage**		**kVolts**
Cat #				**MCOV**		**kVolts**
Serial #				**Duty Cycle Rating**		**kVolts**

Capacitance and Power Factor Test

Insulation Tested	**Test Mode**	**kV**	**Cap (pF)**	**Power factor Measured**	**Power factor Cor. to 20°C**	**mA**	**Watts**
CH-G - Aϕ	**GrndST**						
CH-G - Bφ	**GrndST**						
CH-G - Cφ	**GrndST**						

Insulation Resistance (mΩ)

@ 2.5 kVDC	**φ A**	**φ B**	**φ C**
Ins. Type X **Solid** **Oil**			
Insulation Res. @ 0 °C	201	367	1016
Corrected to 20°C	80.4	146.8	406.4

Mechanical Inspections

Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Insulator Surface Condition	OK	Inspected
Connector Condition	OK	Inspected
Grounding	OK	Inspected
Support Structure	OK	Inspected

Test Conditions	Outdoors/Disconnected
Results Satisfactory	FAIR
Test Equipment	10kV MEGOHMMETER

Notes: No Nameplate. Older pocelain Lightning Arrestors.

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

REPORT

2024 Substation Maintenance Prescott MS4

Rideau ST. Lawrence

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

January 9, 2025

Rideau ST. Lawrence
985 Industrial Rd, Prescott
ON K0E 1T0

Attention	**Joe Kramaric**
Project	**Substation Maintenance**
Location	**Prescott MS4 - 898 Boundary St. Prescott**
Job #	**24IM-5559**

Dear Joe,

K.P.C. Power Electrical Ltd. (KPC Power) has completed the Substation Maintenance program as requested at Rideau ST. Lawrence Prescott MS3 located at 898 Boundary St. Prescott on November 28, 2024.

Included in this report are the Observations, Recommendations and Test Results.

Please feel at liberty to contact our office should you have any questions or concerns.

Thank you for the opportunity to have been of service.

Thank you,

Ram Vellaichamy, C.E.T., M.E.
Field Supervisor, Industrial Maintenance Group

K.P.C. POWER ELECTRICAL LTD.
395 Westney Road S., Ajax ON L1S 6M6 **T** 905.683.6636 **(24-Hour Emergency Response)**
kpcpower.com

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KPC Power

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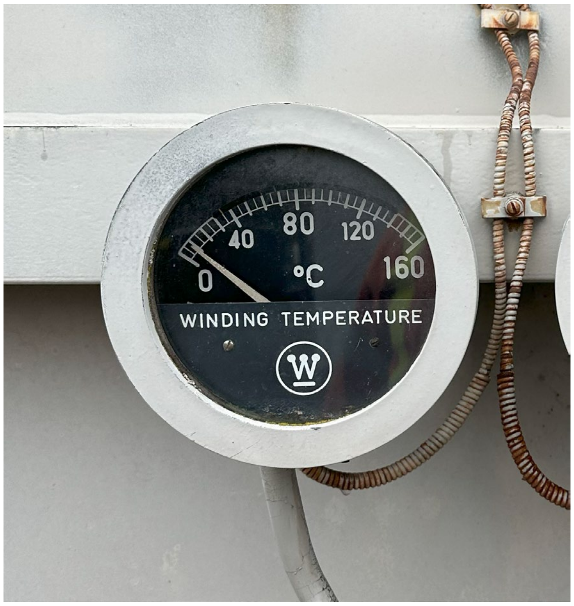
Observations & Recommendations

898 Boundary St. Prescott



Observation:

While conducting inspections of the T1-2L30 Transformer, KPC Technicians noted that the Max. needle in winding temperature gauge was missed.

Recommendation:

It is our recommendation to replace the faulty winding temperature gauge.

Observation:

While conducting inspections of the T1-2L30 Transformer, KPC Technicians noted that there were also minor oil leaks from the secondary Red Phase bushings.

Recommendation:

It is also our recommendation to continue to monitor for further leaking.

Observation:

While conducting inspections of the Feeder Cables, KPC Technicians noted low insulation resistance on ‘C’ Phase of 30F2.

Recommendation:

It is our recommendation to conduct the insulation resistance test on the 30F2 feeder cable after disconnecting the Line side Lightning Arrestors.

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

Inspection Sheets

898 Boundary St. Prescott

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	Nov. 28, 2024
File Number	24IM-5559	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	1 °C
Location	898 Boundary St. Prescott			**Tested By**	RV
Substation	Main Substation MS3			**Approved By**	AN
Equipment I.D.	Substation Yard				

Substation Yard General Inspection

Mechanical Inspections		
Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Tower Structure	OK	Inspected
Metal Enclosed Switchgear	N/A	
Identification Signs	OK	Inspected
Warning Signs	OK	Inspected
Yard Debris	OK	Inspected
Weed Control	OK	Inspected
Ground Connections on Tower	OK	Inspected
Ground Connections on Switchgear	OK	Inspected
Ground Connections on Fence	OK	Inspected
Ground Connections on Gates	OK	Inspected
Ground Connections on Arresters	OK	Inspected
Ground Connections on Transformer(s)	OK	Inspected, 2x Points
Ground Grid + Rods Intact	OK	Inspected
Gradient Mat	OK	Inspected
Fence Assembly	OK	Inspected
Barbed Wire	OK	Inspected
Crushed Stone Depth	OK	Inspected

Lightning Arresters				
Manufacturer		**Voltage**		**kVolts**
Type/Cat #		**MCOV**		**kVolts**

Electrical Tests			
Test Description			
Ground Resistance	**Ω**		

Test Conditions	Isolated
Results Satisfactory	OK
Test Equipment	Visual Inspection

Notes:

KPC

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	Nov. 28, 2024	
File Number	24IM-5559	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	1	**°C**
Location	898 Boundary St. Prescott			**Tested By**	RV	
Substation	Main Substation MS3			**Approved By**	AN	
Equipment I.D.	T1 - 2L30					

Power Transformer - Electrical

Nameplate Data

Manufacturer	Reliance Power		**Vector Group**	Dyn11	**NGR**		**Solid** X
Year Built	1991		**Serial #**	292867	**Res.**		**Ω**
Type	ONAN		**Liquid Type/Volume**	Mineral Oil	1100		**gal.(imp)**
Sealed	**Conservator** X	**Dry Type**	**Total Weight**	33650	**lbs.**		
Rating	5000	**kVA**	**Primary Voltage**	44	**kVolts**		
Impedance	8.31	**%**	**Secondary Voltage**	4160	**Volts**		
Phase	3	**φ**	**BIL (Primary)**	**kV**	**BIL (Secondary)**		**kV**
Oil Temp 15 **°C**	**Max Oil Temp** 40	**°C**	**Winding Temp**	**°C**	**Max Winding Temp**		**°C**

Insulation Resistance

Test Voltage **Hi** 10 **Low** 5 **kVdc**	**H to L + Grnd**	**L to H + Grnd**	**H to L**	**Core**
GΩ @ 0 °C	1.98	1.02	1.72	
Corrected to 20 °C	0.495	0.255	0.43	

Capacitance & Dissipation Factor

Test Voltage **High** 10 **Low** 2	$C_{H-L} + C_{H-G}$	C_{H-G}	C_{H-L}	C_{L-G}	$C_{L-H} + C_{L-G}$
Capacitance (pF)	6995.6	2141.9	4852.9	4722.2	9574
Current (mA)	26.39	8.09	18.3	17.81	36.11
Watts (W)	3.442	1.32	2.115	1.49	3.503
Power Factor	1.3	1.63	1.15	0.83	0.97
Corrected to 20 °C	1.56	1.956	1.38	0.996	1.164

Turns Ratio Test

Tap	**Primary Volts**	**Calculated Ratio**	**H1-H2 X0-X1**			**H2-H3 X0-X2**			**H3-H1 X0-X3**		
			Ratio	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**
1											
2											
3	42952	17.8834	17.8802	-0.02	1.664	17.8801	-0.02	1.873	17.8815	-0.01	1.238
4											
5											

Winding Resistance

Tap	**Current Scale**	**Resistance Unit**	**H1-H2**	**H2-H3**	**H3-H1**	**X0-X1**	**X0-X2**	**X0-X3**
3	5A/5A	Ω/mΩ	1.892	1.83	1.83	40.976	40.357	40.9

Tap Position Found & Left	3/3
Results Satisfactory	OK
Test Equipment	TESTRANO 600 / AEMC 10kV MEGOHMMETER

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	Nov. 28, 2024
File Number	24IM-5559	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	1 °C
Location	898 Boundary St. Prescott			**Tested By**	RV
Substation	Main Substation MS3			**Approved By**	AN
Equipment I.D.	T1-2L30				

Power Transformer (Liquid Filled) - Mechanical

Mechanical Inspections					
Description of Inspection		**Status**			**Comments**
		OK/FAIR/POOR/NA			
Breather & Silica Gel		N/A			
Conservator Tank Gaskets		OK			Inspected
Explosion Vent Gaskets		OK			Inspected
Inspection Cover Gaskets		OK			Inspected
Main Cover Gaskets		OK			Inspected
Primary Bushing Gaskets		OK			Inspected
Primary Bushing Porcelain		OK			Cleaned and Inspected
Primary Bushing Connections		OK			Inspected
Primary Throat Gaskets		N/A			
Secondary Bushing Gaskets		**FAIR**			**Inspected, minor oil leaks**
Secondary Bushing Porcelain		OK			Cleaned and Inspected
Secondary Bushing Connections		OK			Cleaned and Inspected
Secondary Throat Gaskets		N/A			
Pressure Relief Device		N/A			**PSI**
Gas Relay		N/A			
Fan Operation		N/A			
Control Wiring		OK			Inspected
Tap Changer		OK			Inspected
Paint Condition		OK			Inspected **Colour** Grey
Pads		OK			Inspected
Grounding		OK			Inspected
Radiator		OK			Inspected
Oil Level		OK			Inspected
Pressure Gauge		N/A			
Oil Temperature Gauge		OK			Inspected
Winding Temperature Gauge		**POOR**			**Missing Maximum Needle**
Oil Temperature	**Run | Max**	10 °C		20 °C	
Winding Temperature	**Run | Max**	°C		°C	
Results Satisfactory		**POOR**			
Test Equipment		Visual Inspection			

Notes: Winding temp gauge has no max. needle-need to be replaced.
Minor oil leaks from secondary red phase bushing-keep monitoring.

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	Nov. 28, 2024	
File Number	24IM-5559	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	3	°C
Location	898 Boundary St. Prescott			**Tested By**	CP	
Substation	Main Substation MS3			**Approved By**	AN	
Equipment I.D.	Station PT					

Power Transformer - Electrical

Nameplate Data

Manufacturer	English Electric		**Vector Group**	N/A	**NGR**		**Solid**	X	
Year Built	N/A		**Serial #**	283437	**Res.**		**Ω**		
Type	Pole Mount		**Liquid Type/Volume**	Mineral Oil	N/A	**gal.(imp)**			
Sealed	X	**Conservator**		**Dry Type**		**Total Weight**	195	**Kg**	
Rating	3	**kVA**	**Primary Voltage**	4800/2400	**Volts**				
Impedance	N/A	**%**	**Secondary Voltage**	120	**Volts**				
Phase	1	**φ**	**BIL (Primary)**	75	**kV**	**BIL (Secondary)**	N/A	**kV**	
Oil Temp	N/A	**°C**	**Max Oil Temp**	N/A	**°C**	**Winding Temp**	N/A	**°C**	**Max Winding Temp** N/A **°C**

Insulation Resistance

Test Voltage	**Hi**	**2.5**	**Low**		**kVdc**	**H to L + Grnd**	**L to H + Grnd**	**H to L**	**Core**
MΩ @ 5 °C						396			
Corrected to 20 °C						142.56			

Capacitance & Dissipation Factor

Test Voltage	**High**		**Low**		**C_{H-L} + C_{H-G}**	**C_{H-G}**	**C_{H-L}**	**C_{L-G}**	**C_{L-H} + C_{L-G}**
Capacitance (pF)									
Current (mA)									
Watts (W)									
Power Factor									
Corrected to 20 °C									

Turns Ratio Test

Tap	**Primary Volts**	**Calculated Ratio**	**H1-H2 X0-X1**			**H2-H3 X0-X2**			**H3-H1 X0-X3**		
			Ratio	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**	**Ratio**	**Dev%**	**mA**
1											
2											
3											
4											
5											

Winding Resistance

Tap	**Current Scale**	**Resistance Unit**	**H1-H2**	**H2-H3**	**H3-H1**	**X0-X1**	**X0-X2**	**X0-X3**

Tap Position Found & Left	N/A
Results Satisfactory	OK
Test Equipment	Ratech Transformer Turns Ratio Tester / AEMC 10kV MEGOHMMETER

Notes: Accuracy = 0.62. 2 Transformers tested together.

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	Nov. 28, 2024	
File Number	24IM-5559	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	1	**°C**
Location	898 Boundary St. Prescott			**Tested By**	RV	
Substation	Main Substation MS3			**Approved By**	AN	
Equipment I.D.						

Common Bus Inspection & Testing

Nameplate Data				
Manufacturer	N/A	**Voltage**	4.16	**kVolts**
Insulation Type	Grey Porcelain Insulators	**Ambient Temp**	1	**°C**
Conductor Type	AL Bus	**Humidity**	46	**%**

Mechanical Inspection

Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Visible Insulation	OK	Inspected
Grounding	OK	Inspected
Phase Marking	OK	Inspected
Visual All Bolted Connections	OK	Inspected
Connections Torqued	OK	Inspected

Electrical Tests

Bus Identification	**Insulation Resistance (MΩ) @ 5 kV**		
	Aφ	**Bφ**	**Cφ**
Secondary Bus (phase to ground)	197	217	220
	A-B	B-C	C-A
Secondary Bus (phase to phase)	401	333	371

Test Conditions	Humid/Raining
Results Satisfactory	OK
Test Equipment	AEMC 10kV MEGOHMMETER

Notes: Low insulation resistance due to rainy weather conditions.

Client Information

Customer	Rideau ST. Lawrence			Date Tested	Nov. 28, 2024	
File Number	24IM-5559	Customer Ref.	Darryl Reynolds	Ambient Temp	1	°C
Location	898 Boundary St. Prescott			Tested By	CP	
Substation	Main Substation MS3			Approved By	AN	
Equipment I.D.	PT Fuses					

High Voltage Power Fuse

Fuse Holder Nameplate Data				
Manufacturer	ABB	Max Voltage	15	kVolt
Type	N/A	Max Current	100	Amps
Style/Cat #	N/A	Serial #	N/A	
Fuse Link Nameplate Data				
Type	N/A	TCC	N/A	
Style/Cat #	N/A	Amps	100	

Mechanical Inspections		
Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	Inspected
Contact Surfaces	OK	Greased, Cleaned and Inspected
Contact Penetration	OK	Cleaned and Inspected
Contact Alignment	OK	Inspected
Expulsion-Limiting Filters	N/A	
Fuse Barrel Condition	OK	Inspected
Connecter Condition	OK	Inspected
Insulator Condition	OK	Polymer
Phase Barrier Condition	N/A	
Support Structure	OK	Inspected
Heaters & Thermostat	N/A	
Spare Fuse Quality	N/A	None on site
Spare Fuse Quantity	N/A	None on site

Electrical Tests											
Test Description					φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance	@	5	kV	MΩ	396		396			
Contact Resistance	@	10	A	mΩ	10.49		10.31			

Test Conditions	Outdoor/Rain
Results Satisfactory	OK
Test Equipment	AEMC 10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes: Nameplate very faded on both fuses and it is our recommendation to prepare 2 spare fuses for emergency situation.
Low insulation resistance due to weather conditions (Insulation resistance tested with PT Transformers).

Client Information

Customer	Rideau ST. Lawrence			Date Tested	Nov. 28, 2024	
File Number	24IM-5559	Customer Ref.	Darryl Reynolds	Ambient Temp	1	°C
Location	898 Boundary St. Prescott			Tested By	CP	
Substation	Main Substation MS3			Approved By	AN	
Equipment I.D.	30F1 - 3 Phase Reclosure					

High Voltage Recloser

Nameplate Data						
Manufacturer	Kyle Reclosure			Voltage	15.5	kVolts
Type	Type 'W'			Current	400	Amps
Style/Cat #				Interrupting Cap.	12000	Amps
Serial #'s	12178			B.I.L.	110	kVolts
No. of Operations				Closing Solenoid	4.16-4.8kV	

Mechanical Inspections		
Description of Inspection	Status	Comments
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	
Stationary Contact Surfaces	N/A	Enclosed
Moving Contact Surfaces	N/A	Enclosed
Arcing Contact Surfaces	N/A	Enclosed
Contact Alignment	N/A	Enclosed
Arc Chutes	N/A	Enclosed
Phase Barrier Condition	N/A	
Stationary & Moving Bus Stabs	N/A	
Ground Bus Stab	N/A	
Racking Mechanism	N/A	
Electrical & Manual Operation	OK	Operated
Cell Alignment	N/A	
Interlocks	N/A	
Oil Leaks	N/A	
Lifting Strap	N/A	

Electrical Tests											
Test Description					φ A	φ B	φ C	A/B	B/C	C/A
Insulation Resistance	@	5	kV	MΩ	271.9	306.4	407.1	456	328	379
Open Insulation Res.	@	5	kV	GΩ	1.23	0.997	1.56			
Contact Resistance	@	10	A	μΩ	272	283	378			

Test Conditions	Outdoor/Raining
Results Satisfactory	OK
Test Equipment	AEMC 10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	Nov. 28, 2024	
File Number	24IM-5559	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	1	**°C**
Location	898 Boundary St. Prescott			**Tested By**	CP	
Substation	Main Substation MS3			**Approved By**	AN	
Equipment I.D.	30F2 - 3 Phase Reclosure					

High Voltage Recloser

Nameplate Data

Manufacturer	Kyle Reclosure			**Voltage**	15.5	**kVolts**
Type	Type 'W'			**Current**	400	**Amps**
Style/Cat #				**Interrupting Cap.**	12000	**Amps**
Serial #'s	12178			**B.I.L.**	110	**kVolts**
No. of Operations				**Closing Solenoid**	4.16-4.8kV	

Mechanical Inspections

Description of Inspection	**Status**	**Comments**
	OK/FAIR/POOR/NA	
Operating Mechanism	OK	
Stationary Contact Surfaces	N/A	Enclosed
Moving Contact Surfaces	N/A	Enclosed
Arcing Contact Surfaces	N/A	Enclosed
Contact Alignment	N/A	Enclosed
Arc Chutes	N/A	Enclosed
Phase Barrier Condition	N/A	
Stationary & Moving Bus Stabs	N/A	
Ground Bus Stab	N/A	
Racking Mechanism	N/A	
Electrical & Manual Operation	OK	Operated
Cell Alignment	N/A	
Interlocks	N/A	
Oil Leaks	N/A	
Lifting Strap	N/A	

Electrical Tests

Test Description					**φ A**	**φ B**	**φ C**	**A/B**	**B/C**	**C/A**
Insulation Resistance	@	5	kV	MΩ	482	300	327	595	433	416
Open Insulation Res.	@	5	kV	GΩ	2.07	1.56	0.802			
Contact Resistance	@	10	A	μΩ	311	314	303			

Test Conditions	Outdoor/Raining
Results Satisfactory	OK
Test Equipment	AEMC 10kV MEGOHMMETER / 10A MICRO-OHMMETER

Notes:

Client Information

Customer	Rideau ST. Lawrence			**Date Tested**	Nov. 28, 2024
File Number	24IM-5559	**Customer Ref.**	Darryl Reynolds	**Ambient Temp**	1 °C
Location	898 Boundary St. Prescott			**Tested By**	CP
Substation	Main Substation MS3			**Approved By**	AN
Equipment I.D.	Feeder Cables				

Power Cable Inspection

Nameplate Data				
Manufacturer	Canada Wire	**Voltage**	15	**kVolts**
Insulation Type	TR-XLPF	**Ambient Temp**	1	**°C**
Conductor Type	350MCM CV	**Humidity**	93	**%**

Electrical Tests

Feeder Identification	**Cables Per φ**	**Insulation Resistance (MΩ)**				**Tested @ 5 kV**	
		Aφ	**Bφ**	**Cφ**	**A/B**	**B/C**	**C/A**
30F2	1	918	455	70.6			
30F1	1	1715	310	911			

Test Conditions	Raining/Humid
Results Satisfactory	**POOR**
Test Equipment	AEMC 10kV MEGOHMMETER

Notes: Low insulation resistance on C Phase of 30F2. Further investigation is recommended.

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

REPORT 25IM-5107

2025 Oil Analysis

Various Substations

Rideau St. Lawrence Distribution Inc.

March 25, 2025

KPC Power
A DIVISION OF KPC UTILITY SOLUTIONS GROUP

Rideau St. Lawrence Distribution Inc.
985 Industrial Road
Prescott, ON
K0E 1T0

Attention	**Layne Scott**
Project	**Oil Report**
Location	**Various Substations**
Job #	**25IM-5107**

Dear Layne,

K.P.C. Power Electrical Ltd. (KPC Power) has completed the Oil Sampling and Analysis program as requested on the ten transformers within your various substations on March 24th, 2025.

Included in this report are the Oil Sample Results.

Please feel at liberty to contact our office should you have any questions or concerns.

Thank you for the opportunity to have been of service.

Thank you,

Ben Nguyen
Infrared Thermographer (Level III), Industrial Maintenance Group

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

Oil Analysis

Rideau St. Lawrence Distribution Inc.

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TEST REPORT
01-7823076-743593-00

KPC Power Electrical Ltd	**Serial#:** C5201	**Mfr:** RELIANCE	**Control#:** 7823076
	Location: 209 DURHAM ST N	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 44	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1990	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** SEAL	**Syringe ID:** 8006907	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **USGal:** 1080	**Sampled By:** PK	
Customer ID: T1			

	Lab Control Number:	7823076	7799718	7678696	7627732	6974955
	Date Sampled:	03/10/2025	11/27/2024	09/18/2023	03/16/2023	11/15/2016
	Order Number:	743593	737635	708271	696115	525171
	Oil Temp:	21	25	30	20	45
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.48	0.48	0.45	0.5	0.45
ASTM	**Transformer Age (yrs):**	35	34	33	33	26
D-3612[1]	**Hydrogen (H2) (µL/L):**	3	4	6	<2	7
	Methane (CH4) (µL/L):	3	2	3	2	4
	Ethane (C2H6) (µL/L):	2	2	3	2	2
	Ethylene (C2H4) (µL/L):	6	5	5	6	3
	Acetylene (C2H2) (µL/L):	<1	<1	<1	<1	<1
	Carbon Monoxide (CO) (µL/L):	92	84	129	73	193
	Carbon Dioxide (CO2) (µL/L):	1625	1433	1835	1435	1732
	Nitrogen (N2) (µL/L):	59984	43432	58762	48943	68884
	Oxygen (O2) (µL/L):	29070	20692	26735	24454	30701

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		Gas Level Deltas(µL/L) (2 most recent samples)		Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	3	Normal (<= 40)	-1		0	No active gassing (<= 10)
Methane (CH4)	3	Normal (<= 20)	1	Normal Variation (<= 10)	0	No active gassing (<= 3)
Ethane (C2H6)	2	Normal (<= 15)	0	Normal Variation (<= 7)	0	No active gassing (<= 2)
Ethylene (C2H4)	6	Normal (<= 60)	1	Normal Variation (<= 20)	0	No active gassing (<= 5)
Acetylene (C2H2)	<1	Normal (<= 2)	0	Normal Variation (<= 0)	0	No active gassing (<= 0)
Carbon Monoxide (CO)	92	Normal (<= 500)	8	Normal Variation (<= 175)	-2	No active gassing (<= 80)
Carbon Dioxide (CO2)	1625	Normal (<= 5500)	192	Normal Variation (<= 1750)	-14	No active gassing (<= 800)

DGA Diagnostics	**Roger's Ratio**	Diagnostic not applicable - Gas levels normal.
	Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
	Duval Pentagons	Diagnostic not applicable - Gas levels normal.
	Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
	DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
	Resampling Protocol	Routine Screening
	AVO Resampling Recommendation	Resample within 1 year.

Comment:

General Oil Quality (GOQ)

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823076-743593-00

KPC Power Electrical Ltd	**Serial#:**	C5201	**Mfr:**	RELIANCE	**Control#:**	7823076
	Location:	209 DURHAM ST N	**kV:**	44	**Order#:**	743593
	Equipment:	TRANSFORMER	**kVA:**	44	**Account:**	6541
AJAX, ON L1S 6M6 CA	**Compartment:**	MAIN(BOTTOM)	**Year Mf'd:**	1990	**Received:**	03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:**	SEAL	**Syringe ID:**	8006907	**Reported:**	03/24/2025
PO#: 25IM-5107	**Bank:**	**Phase:** 3	**Bottle ID:**			
Project ID:	**Fluid:** MIN	**USGal:** 1080	**Sampled By:**	PK		
Customer ID: T1						

		Lab Control Number:	7823076	7799718	7678696	7627732	6974955
		Date Sampled:	03/10/2025	11/27/2024	09/18/2023	03/16/2023	11/15/2016
		Order Number:	743593	737635	708271	696115	525171
		Oil Temp:	21	25	30	20	45
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	8	9	25	10	31
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	35.92	35.56	36.89	37.28	40.91
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	0.026	0.023	0.021	0.025	0.019
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L1.0	L1.0	L1.0	L1.0	L1.0
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS	PASS	PASS	PASS	PASS
			CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	ND	ND	ND	ND
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	56 (21°C)	57 (23°C)	26 (22°C)	57 (23°C)	56 (23°C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.867	0.8665	0.8669	0.8671	0.8672
ASTM D-2668	**Oxidation Inhibitor**	**(wt. %)**					0.292

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Acceptable for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).

Comment:

Furanic Compound	**2-Furaldehyde (µg/L):**	165
ASTM D-5837	**5-Hydroxy-methyl-furaldehyde (µg/L):**	< 10
	2-Acetylfuran (µg/L):	< 10
	5-Methyl-2-furaldehyde (µg/L):	< 10
	2-Furyl alcohol (µg/L):	< 10

Furanic Compound Diagnostics (most recent sample):

New insulation with a high degree of mechanical strength will typically have a Degree of Polymerization (DP) of 1000-1300. "Middle Aged" paper is approximately 500 and paper with less than 250 is in its "Old Age." Severely degraded insulation with a DP of 150 or less will have very little mechanical strength and may result in a transformer failure. The above estimations are based on a study by Chendong of GSU transformers filled with mineral oil.

Estimated Average Degree of Polymerization (DP):

Estimated Operating Age of the Equipment:

Notations:

Comment:

PCB	**Concentration (mg/kg):**	< 1.0 mg/kg
ASTM Method D-4059[1]	**PCB Type (Arocolor):**	ND
	Reporting Limit:	1.0

Comment:

End of Test Report

Authorized By: ____________________

JANET KAROLAT
SUPV CHEMIST

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823075-743593-00

KPC Power Electrical Ltd	**Serial#:** 292867	**Mfr:** RELIANCE	**Control#:** 7823075
	Location:	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 5000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:**	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** CONS	**Syringe ID:** 8000898	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **IMPGal:** 1100	**Sampled By:** PK	
Customer ID: Q230 T1			

	Lab Control Number:	7823075	7799719	7678698	7627734
	Date Sampled:	03/10/2025	11/28/2024	09/18/2023	03/16/2023
	Order Number:	743593	737635	708271	696115
	Oil Temp:	12	10	30	10
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.48	0.48	0.46	0.5
ASTM	**Transformer Age (yrs):**	Unknown	Unknown	Unknown	Unknown
D-3612[1]	**Hydrogen (H2) (µL/L):**	10	14	15	11
	Methane (CH4) (µL/L):	1	1	2	<1
	Ethane (C2H6) (µL/L):	<1	<1	<1	<1
	Ethylene (C2H4) (µL/L):	3	2	3	2
	Acetylene (C2H2) (µL/L):	<1	<1	<1	<1
	Carbon Monoxide (CO) (µL/L):	59	63	79	54
	Carbon Dioxide (CO2) (µL/L):	1063	1032	1256	1066
	Nitrogen (N2) (µL/L):	60526	52177	62424	55985
	Oxygen (O2) (µL/L):	29330	25013	28888	27736

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		**Gas Level Deltas(µL/L) (2 most recent samples)**		**Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)**	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	10	Normal (<= 40)	-4		0	No active gassing (<= 10)
Methane (CH4)	1	Normal (<= 20)	0	Normal Variation (<= 10)	0	No active gassing (<= 3)
Ethane (C2H6)	0	Normal (<= 15)	0	Normal Variation (<= 7)	0	No active gassing (<= 2)
Ethylene (C2H4)	3	Normal (<= 50)	1	Normal Variation (<= 20)	0	No active gassing (<= 5)
Acetylene (C2H2)	<1	Normal (<= 2)	0	Normal Variation (<= 0)	0	No active gassing (<= 0)
Carbon Monoxide (CO)	59	Normal (<= 500)	-4		-1	No active gassing (<= 80)
Carbon Dioxide (CO2)	1063	Normal (<= 5000)	31	Normal Variation (<= 1750)	-47	No active gassing (<= 800)

DGA Diagnostics **Roger's Ratio**	Diagnostic not applicable - Gas levels normal.
Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
Duval Pentagons	Diagnostic not applicable - Gas levels normal.
Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
Resampling Protocol	Routine Screening
AVO Resampling Recommendation	Resample within 1 year.

Comment:

General Oil Quality (GOQ)

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823075-743593-00

KPC Power Electrical Ltd	**Serial#:** 292867	**Mfr:** RELIANCE	**Control#:** 7823075
	Location:	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 5000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:**	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** CONS	**Syringe ID:** 8000898	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **IMPGal:** 1100	**Sampled By:** PK	
Customer ID: Q230 T1			

		Lab Control Number:	7823075	7799719	7678698	7627734
		Date Sampled:	03/10/2025	11/28/2024	09/18/2023	03/16/2023
		Order Number:	743593	737635	708271	696115
		Oil Temp:	12	10	30	10
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	6	6	21	8
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	37.84	33.47	38.53	21.6
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	0.018	0.020	0.017	0.067
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L1.0	L1.0	L1.0	L2.0
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS	PASS	PASS	PASS
			CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	TRACE	TRACE	ND
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	44 (22°C)	50 (23°C)	33 (23°C)	53 (22°C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.8499	0.8495	0.8495	0.8863

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Acceptable for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).

Comment:

PCB	**Concentration (mg/kg):**	16.6 mg/kg
ASTM Method D-4059[1]	**PCB Type (Arocolor):**	1260
	Reporting Limit:	1.0

Comment:

End of Test Report

Authorized By:

JANET KAROLAT
SUPV CHEMIST

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823077-743593-00

KPC Power Electrical Ltd	**Serial#:** 103CHURCHILL	**Mfr:**	**Control#:** 7823077
	Location: 103 CHURCHILL RD E	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 5000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1963	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** CONS	**Syringe ID:** 8005538	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **IMPGal:** 870	**Sampled By:** PK	
Customer ID: T2 Q40			

	Lab Control Number:	7823077	7678700
	Date Sampled:	03/10/2025	09/19/2023
	Order Number:	743593	708271
	Oil Temp:		30
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.46	0.41
ASTM	**Transformer Age (yrs):**	62	60
D-3612[1]	**Hydrogen (H2) (µL/L):**	4	11
	Methane (CH4) (µL/L):	2	2
	Ethane (C2H6) (µL/L):	<1	<1
	Ethylene (C2H4) (µL/L):	11	12
	Acetylene (C2H2) (µL/L):	<1	<1
	Carbon Monoxide (CO) (µL/L):	124	228
	Carbon Dioxide (CO2) (µL/L):	1791	2064
	Nitrogen (N2) (µL/L):	68301	63767
	Oxygen (O2) (µL/L):	31098	25874

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		**Gas Level Deltas(µL/L) (2 most recent samples)**		**Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)**	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	4	Normal (<= 40)	-7			
Methane (CH4)	2	Normal (<= 20)	0	Normal Variation (<= 10)		
Ethane (C2H6)	0	Normal (<= 15)	0	Normal Variation (<= 7)		
Ethylene (C2H4)	11	Normal (<= 60)	-1			
Acetylene (C2H2)	<1	Normal (<= 2)	0	Normal Variation (<= 0)		
Carbon Monoxide (CO)	124	Normal (<= 500)	-104			
Carbon Dioxide (CO2)	1791	Normal (<= 5500)	-273			

DGA Diagnostics Roger's Ratio	Diagnostic not applicable - Gas levels normal.
Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
Duval Pentagons	Diagnostic not applicable - Gas levels normal.
Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
Resampling Protocol	Routine Screening
AVO Resampling Recommendation	Resample within 1 year.

Comment: LARGE BUBBLE IN SYRINGE AS RECEIVED, MAY AFFECT DGA RESULT.

General Oil Quality (GOQ)

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

KPC Power Electrical Ltd	**Serial#:** 103CHURCHILL	**Mfr:**	**Control#:** 7823077
	Location: 103 CHURCHILL RD E	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 5000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1963	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** CONS	**Syringe ID:** 8005538	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **IMPGal:** 870	**Sampled By:** PK	
Customer ID: T2 Q40			

		Lab Control Number:	7823077	7678700
		Date Sampled:	03/10/2025	09/19/2023
		Order Number:	743593	708271
		Oil Temp:		30
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	7	18
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	28.7	29.05
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	0.058	0.052
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L2.0	L2.0
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS	PASS
			CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	ND
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	43 (22°C)	37 (23°C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.8566	0.8563

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Acceptable for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).

Comment:

PCB	**Concentration (mg/kg):**	141.0 mg/kg
ASTM Method D-4059[1]	**PCB Type (Arocolor):**	1260
	Reporting Limit:	1.0

Comment:

End of Test Report

Authorized By:

JANET KAROLAT
SUPV CHEMIST

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TEST REPORT
01-7823078-743593-00

KPC Power Electrical Ltd	**Serial#:**	149836	**Mfr:**	MOLONEY ELECTRIC	**Control#:**	7823078
	Location:	3038 JOHN ST	**kV:**	44	**Order#:**	743593
	Equipment:	TRANSFORMER	**kVA:**	3000	**Account:**	6541
AJAX, ON L1S 6M6 CA	**Compartment:**	MAIN(BOTTOM)	**Year Mf'd:**	1952	**Received:**	03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:**	SEAL	**Syringe ID:**	8006798	**Reported:**	03/24/2025
PO#: 25IM-5107	**Bank:**	**Phase:** 3	**Bottle ID:**			
Project ID:	**Fluid:** MIN	**IMPGal:** 1453	**Sampled By:**	PK		
Customer ID: T2L						

	Lab Control Number:	7823078	7799720	7677030	7634860	7627736
	Date Sampled:	03/10/2025	11/29/2024	09/15/2023	04/18/2023	03/16/2023
	Order Number:	743593	737635	707885	698027	696115
	Oil Temp:					
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.35	0.37	0.3	0.36	0.39
ASTM	**Transformer Age (yrs):**	73	72	71	71	71
D-3612[1]	**Hydrogen (H2) (µL/L):**	**96**	122	743	2216	2408
	Methane (CH4) (µL/L):	**34**	30	107	206	200
	Ethane (C2H6) (µL/L):	12	11	21	55	61
	Ethylene (C2H4) (µL/L):	**108**	104	240	383	361
	Acetylene (C2H2) (µL/L):	**710**	576	1651	2921	2762
	Carbon Monoxide (CO) (µL/L):	186	168	231	179	162
	Carbon Dioxide (CO2) (µL/L):	2646	2407	3062	2713	2542
	Nitrogen (N2) (µL/L):	59278	46136	63617	57849	53701
	Oxygen (O2) (µL/L):	20973	16877	18912	21020	21032

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		**Gas Level Deltas(µL/L) (2 most recent samples)**		**Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)**	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	96	High (> 90)	-26		-1106	No active gassing (<= 10)
Methane (CH4)	34	High (> 30)	4	Normal Variation (<= 10)	-88	No active gassing (<= 3)
Ethane (C2H6)	12	Normal (<= 15)	1	Normal Variation (<= 7)	-23	No active gassing (<= 2)
Ethylene (C2H4)	108	Elevated (> 60)	4	Normal Variation (<= 20)	-139	No active gassing (<= 5)
Acetylene (C2H2)	710	High (> 7)	134	Excessive Variation (> 0)	-1131	No active gassing (<= 0)
Carbon Monoxide (CO)	186	Normal (<= 500)	18	Normal Variation (<= 175)	-2	No active gassing (<= 80)
Carbon Dioxide (CO2)	2646	Normal (<= 5500)	239	Normal Variation (<= 1750)	-91	No active gassing (<= 800)

DGA Diagnostics	**Roger's Ratio**	Not Determined
	Duval Triangles	Triangle 1: Low energy discharge (sparking) Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
	Duval Pentagons	Pentagon 1: Low energy discharge (sparking) Pentagon 2: Low energy discharge (sparking)
	Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
	DGA Status	Status 3 - High gas levels and/or probable active gassing. Probably suspicious - perform fault identification and transformer assessment. Take appropriate action based on transformer assessment results and company policy.
	Resampling Protocol	Surveillance
	AVO Resampling	Increase frequency to verify gassing rates. Consider online monitoring and comprehensive engineering assessment.

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823078-743593-00

KPC Power Electrical Ltd	**Serial#:** 149836	**Mfr:** MOLONEY ELECTRIC	**Control#:** 7823078
	Location: 3038 JOHN ST	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 3000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1952	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** SEAL	**Syringe ID:** 8006798	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **IMPGal:** 1453	**Sampled By:** PK	
Customer ID: T2L			

		Lab Control Number:	7823078	7799720	7677030	7634860	7627736
		Date Sampled:	03/10/2025	11/29/2024	09/15/2023	04/18/2023	03/16/2023
		Order Number:	743593	737635	707885	698027	696115
		Oil Temp:					
Recommendation							
Comment:							
General Oil Quality (GOQ)							
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	10	6	27	18	13
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	**23.11**	22.78	22.92	23.02	23.31
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	0.048	0.049	0.049	0.058	0.048
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L1.5	L1.5	L1.5	L1.5	L1.5
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS	PASS	PASS	PASS	PASS
			CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	ND	ND	TRACE	ND
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	40 (22°C)	35 (23°C)	26 (23°C)	34 (22°C)	44 (22°C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.8814	0.8807	0.8813	0.8809	0.8797

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Below limit for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).
Comment:		

PCB	**Concentration (mg/kg):**	5.3 mg/kg
ASTM Method D-4059[1]	**PCB Type (Arocolor):**	1260-1254
	Reporting Limit:	1.0
Comment:		

End of Test Report

Authorized By:

JANET KAROLAT
SUPV CHEMIST

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TEST REPORT
01-7823079-743593-00

KPC Power Electrical Ltd	**Serial#:** C197	**Mfr:** BROWN BOVERI	**Control#:** 7823079
	Location: CARDINAL DS1	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 3000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1953	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** CONS	**Syringe ID:** 8006760	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **Liters:** 8500	**Sampled By:** PK	
Customer ID: T1			

	Lab Control Number:	7823079	7799723	7677031	7627741
	Date Sampled:	03/10/2025	11/29/2024	09/15/2023	03/16/2023
	Order Number:	743593	737635	707885	696115
	Oil Temp:		10		
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.35	0.33	0.32	0.37
ASTM	**Transformer Age (yrs):**	72	71	70	70
D-3612[1]	**Hydrogen (H2) (µL/L):**	17	25	29	23
	Methane (CH4) (µL/L):	9	9	7	9
	Ethane (C2H6) (µL/L):	5	5	6	6
	Ethylene (C2H4) (µL/L):	6	8	8	10
	Acetylene (C2H2) (µL/L):	<1	<1	<1	<1
	Carbon Monoxide (CO) (µL/L):	227	233	282	197
	Carbon Dioxide (CO2) (µL/L):	2735	3036	3642	2876
	Nitrogen (N2) (µL/L):	63108	54081	65049	58687
	Oxygen (O2) (µL/L):	22324	17757	20504	21496

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		**Gas Level Deltas(µL/L) (2 most recent samples)**		**Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)**	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	17	Normal (<= 40)	-8		-3	No active gassing (<= 10)
Methane (CH4)	9	Normal (<= 20)	0	Normal Variation (<= 10)	0	No active gassing (<= 3)
Ethane (C2H6)	5	Normal (<= 15)	0	Normal Variation (<= 7)	-1	No active gassing (<= 2)
Ethylene (C2H4)	6	Normal (<= 60)	-2		-1	No active gassing (<= 5)
Acetylene (C2H2)	<1	Normal (<= 2)	0	Normal Variation (<= 0)	0	No active gassing (<= 0)
Carbon Monoxide (CO)	227	Normal (<= 500)	-6		2	No active gassing (<= 80)
Carbon Dioxide (CO2)	2735	Normal (<= 5500)	-301		-164	No active gassing (<= 800)

DGA Diagnostics	**Roger's Ratio**	Diagnostic not applicable - Gas levels normal.
	Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
	Duval Pentagons	Diagnostic not applicable - Gas levels normal.
	Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
	DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
	Resampling Protocol	Routine Screening
	AVO Resampling Recommendation	Resample within 1 year.

Comment:

General Oil Quality (GOQ)

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm^2/s = cSt

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TEST REPORT
01-7823079-743593-00

KPC Power Electrical Ltd	**Serial#:** C197	**Mfr:** BROWN BOVERI	**Control#:** 7823079
	Location: CARDINAL DS1	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 3000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1953	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** CONS	**Syringe ID:** 8006760	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **Liters:** 8500	**Sampled By:** PK	
Customer ID: T1			

		Lab Control Number:	7823079	7799723	7677031	7627741
		Date Sampled:	03/10/2025	11/29/2024	09/15/2023	03/16/2023
		Order Number:	743593	737635	707885	696115
		Oil Temp:		10		
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	10	17	27	15
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	**21.4**	21.47	21.44	38.4
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	0.057	0.056	0.062	0.022
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L2.0	L2.0	L2.0	L0.5
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS	PASS	PASS	PASS
			CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	ND	ND	ND
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	51 (22°C)	37 (23°C)	25 (23°C)	62 (22°C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.8864	0.8857	0.8861	0.8495

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Below limit for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).

Comment:

PCB	**Concentration (mg/kg):**	1.4 mg/kg
ASTM Method D-4059[1]	**PCB Type (Arocolor):**	1260
	Reporting Limit:	1.0

Comment:

End of Test Report

Authorized By:

JANET KAROLAT
SUPV CHEMIST

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823072-743593-00

KPC Power Electrical Ltd	**Serial#:** 152707	**Mfr:** NORTHERN	**Control#:** 7823072
	Location: IROQUOIS DS	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 3000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 2015	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** SEAL	**Syringe ID:** 8006258	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **Liters:** 3273	**Sampled By:** PK	
Customer ID: T2			

	Lab Control Number:	7823072	7799726	7678697	7627735
	Date Sampled:	03/10/2025	11/29/2024	09/13/2023	03/16/2023
	Order Number:	743593	737635	708271	696115
	Oil Temp:	25	25	40	20
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.23	0.21	0.22	0.26
ASTM	**Transformer Age (yrs):**	10	9	8	8
D-3612[1]	**Hydrogen (H2) (µL/L):**	9	9	10	8
	Methane (CH4) (µL/L):	6	6	6	4
	Ethane (C2H6) (µL/L):	2	2	2	1
	Ethylene (C2H4) (µL/L):	8	8	6	6
	Acetylene (C2H2) (µL/L):	<1	<1	<1	<1
	Carbon Monoxide (CO) (µL/L):	496	505	477	326
	Carbon Dioxide (CO2) (µL/L):	1792	1894	2168	1326
	Nitrogen (N2) (µL/L):	67215	61135	70338	54807
	Oxygen (O2) (µL/L):	15231	13044	15519	14273

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		**Gas Level Deltas(µL/L) (2 most recent samples)**		**Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)**	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	9	Normal (<= 40)	0	Normal Variation (<= 25)	0	No active gassing (<= 10)
Methane (CH4)	6	Normal (<= 20)	0	Normal Variation (<= 10)	1	No active gassing (<= 3)
Ethane (C2H6)	2	Normal (<= 15)	0	Normal Variation (<= 7)	0	No active gassing (<= 2)
Ethylene (C2H4)	8	Normal (<= 60)	0	Normal Variation (<= 20)	1	No active gassing (<= 5)
Acetylene (C2H2)	<1	Normal (<= 2)	0	Normal Variation (<= 0)	0	No active gassing (<= 0)
Carbon Monoxide (CO)	496	Normal (<= 500)	-9		71	No active gassing (<= 80)
Carbon Dioxide (CO2)	1792	Normal (<= 5500)	-102		128	No active gassing (<= 800)

DGA Diagnostics	**Roger's Ratio**	Diagnostic not applicable - Gas levels normal.
	Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
	Duval Pentagons	Diagnostic not applicable - Gas levels normal.
	Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
	DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
	Resampling Protocol	Routine Screening
	AVO Resampling Recommendation	Resample within 1 year.

Comment:

General Oil Quality (GOQ)

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

KPC Power Electrical Ltd	**Serial#:** 152707	**Mfr:** NORTHERN	**Control#:** 7823072
	Location: IROQUOIS DS	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 3000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 2015	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** SEAL	**Syringe ID:** 8006258	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **Liters:** 3273	**Sampled By:** PK	
Customer ID: T2			

		Lab Control Number:	7823072	7799726	7678697	7627735
		Date Sampled:	03/10/2025	11/29/2024	09/13/2023	03/16/2023
		Order Number:	743593	737635	708271	696115
		Oil Temp:	25	25	40	20
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	3	3	6	3
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	43.18	43.13	43.71	43.86
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	0.008	0.003	0.008	0.012
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L0.5	L0.5	L0.5	L0.5
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS	PASS	PASS	PASS
			CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	ND	ND	ND
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	62 (21°C)	58 (23°C)	41 (22°C)	58 (22°C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.8733	0.8723	0.8728	0.8731

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Acceptable for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).
Comment:		

PCB	**Concentration (mg/kg):**	< 1.0 mg/kg
ASTM Method D-4059[1]	**PCB Type (Arocolor):**	ND
	Reporting Limit:	1.0
Comment:		

End of Test Report

Authorized By:

JANET KAROLAT
SUPV CHEMIST

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823070-743593-00

KPC Power Electrical Ltd	**Serial#:**	C199	**Mfr:**	BROWN BOVERI	**Control#:**	7823070
	Location:	IROQUOIS DS	**kV:**	44	**Order#:**	743593
	Equipment:	TRANSFORMER	**kVA:**	3000	**Account:**	6541
AJAX, ON L1S 6M6 CA	**Compartment:**	MAIN(BOTTOM)	**Year Mf'd:**	1953	**Received:**	03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:**	CONS	**Syringe ID:**	8007449	**Reported:**	03/24/2025
PO#: 25IM-5107	**Bank:**	**Phase:** 3	**Bottle ID:**			
Project ID:	**Fluid:** MIN	**Liters:** 8500	**Sampled By:**	PK		
Customer ID: T1						

	Lab Control Number:	7823070	7799727	7678699	7627733
	Date Sampled:	03/10/2025	11/29/2024	09/18/2023	03/16/2023
	Order Number:	743593	737635	708271	696115
	Oil Temp:	26	20	30	20
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.41	0.38	0.28	0.44
ASTM	**Transformer Age (yrs):**	72	71	70	70
D-3612[1]	**Hydrogen (H2) (µL/L):**	8	15	30	<2
	Methane (CH4) (µL/L):	4	4	5	3
	Ethane (C2H6) (µL/L):	4	3	3	3
	Ethylene (C2H4) (µL/L):	4	4	4	5
	Acetylene (C2H2) (µL/L):	<1	<1	<1	<1
	Carbon Monoxide (CO) (µL/L):	196	235	365	161
	Carbon Dioxide (CO2) (µL/L):	2066	2132	2582	1957
	Nitrogen (N2) (µL/L):	58798	49989	59585	47443
	Oxygen (O2) (µL/L):	24167	18800	16589	20705

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		**Gas Level Deltas(µL/L) (2 most recent samples)**		**Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)**	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	8	Normal (<= 40)	-7		0	No active gassing (<= 10)
Methane (CH4)	4	Normal (<= 20)	0	Normal Variation (<= 10)	0	No active gassing (<= 3)
Ethane (C2H6)	4	Normal (<= 15)	1	Normal Variation (<= 7)	0	No active gassing (<= 2)
Ethylene (C2H4)	4	Normal (<= 60)	0	Normal Variation (<= 20)	0	No active gassing (<= 5)
Acetylene (C2H2)	<1	Normal (<= 2)	0	Normal Variation (<= 0)	0	No active gassing (<= 0)
Carbon Monoxide (CO)	196	Normal (<= 500)	-39		-11	No active gassing (<= 80)
Carbon Dioxide (CO2)	2066	Normal (<= 5500)	-66		-45	No active gassing (<= 800)

DGA Diagnostics	**Roger's Ratio**	Diagnostic not applicable - Gas levels normal.
	Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
	Duval Pentagons	Diagnostic not applicable - Gas levels normal.
	Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
	DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
	Resampling Protocol	Routine Screening
	AVO Resampling Recommendation	Resample within 1 year.

Comment:

General Oil Quality (GOQ)

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823070-743593-00

KPC Power Electrical Ltd	**Serial#:** C199	**Mfr:** BROWN BOVERI	**Control#:** 7823070
	Location: IROQUOIS DS	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 3000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1953	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** CONS	**Syringe ID:** 8007449	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **Liters:** 8500	**Sampled By:** PK	
Customer ID: T1			

		Lab Control Number:	7823070	7799727	7678699	7627733
		Date Sampled:	03/10/2025	11/29/2024	09/18/2023	03/16/2023
		Order Number:	743593	737635	708271	696115
		Oil Temp:	26	20	30	20
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	11	10	24	12
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	**18.59**	17.97	18.76	19.15
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	**0.220**	0.204	0.193	0.212
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L3.0	L3.0	L3.0	L3.0
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS	PASS	PASS	PASS
			CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	ND	TRACE	ND
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	54 (20°C)	51 (22°C)	56 (23°C)	65 (22°C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.8874	0.8866	0.8865	0.8868

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Below limit for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Exceeds limit for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).
Comment:		

PCB	**Concentration (mg/kg):**	1.3 mg/kg
ASTM Method D-4059[1]	**PCB Type (Arocolor):**	1260
	Reporting Limit:	1.0
Comment:		

End of Test Report

Authorized By: ____________________

JANET KAROLAT
SUPV CHEMIST

KPC Power Electrical Ltd	**Serial#:** 5261221	**Mfr:** STEIN	**Control#:** 7823073
	Location: 11 FIFTH ST EAST	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 5000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 2023	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** SEAL	**Syringe ID:** 8004824	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **Liters:** 4719	**Sampled By:** PK	
Customer ID: MS1-T2			

	Lab Control Number:	7823073	7799724
	Date Sampled:	03/11/2025	11/29/2024
	Order Number:	743593	737635
	Oil Temp:	25	20
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.08	0.08
ASTM	**Transformer Age (yrs):**	2	1
D-3612[1]	**Hydrogen (H2) (µL/L):**	3	4
	Methane (CH4) (µL/L):	<1	<1
	Ethane (C2H6) (µL/L):	<1	<1
	Ethylene (C2H4) (µL/L):	<1	<1
	Acetylene (C2H2) (µL/L):	<1	<1
	Carbon Monoxide (CO) (µL/L):	33	30
	Carbon Dioxide (CO2) (µL/L):	175	198
	Nitrogen (N2) (µL/L):	64335	56488
	Oxygen (O2) (µL/L):	5244	4315

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		Gas Level Deltas(µL/L) (2 most recent samples)		Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	3	Normal (<= 75)	-1			
Methane (CH4)	0	Normal (<= 45)	0	Normal Variation (<= 30)		
Ethane (C2H6)	0	Normal (<= 30)	0	Normal Variation (<= 25)		
Ethylene (C2H4)	0	Normal (<= 20)	0	Normal Variation (<= 20)		
Acetylene (C2H2)	<1	Normal (<= 1)	0	Normal Variation (<= 0)		
Carbon Monoxide (CO)	33	Normal (<= 900)	3	Normal Variation (<= 250)		
Carbon Dioxide (CO2)	175	Normal (<= 5000)	-23			

DGA Diagnostics **Roger's Ratio**	Diagnostic not applicable - Gas levels normal.
Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
Duval Pentagons	Diagnostic not applicable - Gas levels normal.
Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
Resampling Protocol	Routine Screening
AVO Resampling Recommendation	Resample within 1 year.

Comment:

General Oil Quality (GOQ)

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823073-743593-00

KPC Power Electrical Ltd	**Serial#:** 5261221	**Mfr:** STEIN	**Control#:** 7823073
	Location: 11 FIFTH ST EAST	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 5000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 2023	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** SEAL	**Syringe ID:** 8004824	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **Liters:** 4719	**Sampled By:** PK	
Customer ID: MS1-T2			

		Lab Control Number:	7823073	7799724
		Date Sampled:	03/11/2025	11/29/2024
		Order Number:	743593	737635
		Oil Temp:	25	20
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	<2	<2
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	44.89	44.4
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	0.006	0.003
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L0.5	L0.5
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS	PASS
			CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	ND
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	63 (21°C)	56 (23°C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.828	0.8275

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Acceptable for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).

Comment:

PCB	**Concentration (mg/kg):**	< 1.0 mg/kg
ASTM Method D-4059[1]	**PCB Type (Arocolor):**	ND
	Reporting Limit:	1.0

Comment:

End of Test Report

Authorized By: J. Karolat

JANET KAROLAT
SUPV CHEMIST

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823074-743593-00

KPC Power Electrical Ltd	**Serial#:** 12445	**Mfr:**	**Control#:** 7823074
	Location: QL2	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 3000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1965	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** CONS	**Syringe ID:** 8007918	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **Liters:** 7850	**Sampled By:** PK	
Customer ID: T1			

	Lab Control Number:	7823074	7799721	7677033	7677032	7627738
	Date Sampled:	03/10/2025	11/29/2024	09/15/2023	09/15/2023	03/16/2023
	Order Number:	743593	737635	707885	707885	696115
	Oil Temp:	30	10	65	40	30
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.48	0.48	0.42	0.47	0.49
ASTM	**Transformer Age (yrs):**	60	59	58	58	58
D-3612[1]	**Hydrogen (H2) (µL/L):**	7	11	<2	135	8
	Methane (CH4) (µL/L):	1	1	<1	<1	1
	Ethane (C2H6) (µL/L):	<1	<1	<1	<1	<1
	Ethylene (C2H4) (µL/L):	<1	<1	<1	3	2
	Acetylene (C2H2) (µL/L):	<1	<1	<1	<1	<1
	Carbon Monoxide (CO) (µL/L):	62	66	3	92	61
	Carbon Dioxide (CO2) (µL/L):	1062	926	91	1524	1320
	Nitrogen (N2) (µL/L):	64376	43725	13996	62139	57845
	Oxygen (O2) (µL/L):	30872	21074	5865	28990	28609

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		**Gas Level Deltas(µL/L) (2 most recent samples)**		**Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)**	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	7	Normal (<= 40)	-4		-17	No active gassing (<= 10)
Methane (CH4)	1	Normal (<= 20)	0	Normal Variation (<= 10)	0	No active gassing (<= 3)
Ethane (C2H6)	0	Normal (<= 15)	0	Normal Variation (<= 7)	0	No active gassing (<= 2)
Ethylene (C2H4)	0	Normal (<= 60)	0	Normal Variation (<= 20)	-1	No active gassing (<= 5)
Acetylene (C2H2)	<1	Normal (<= 2)	0	Normal Variation (<= 0)	0	No active gassing (<= 0)
Carbon Monoxide (CO)	62	Normal (<= 500)	-4		6	No active gassing (<= 80)
Carbon Dioxide (CO2)	1062	Normal (<= 5500)	136	Normal Variation (<= 1750)	-42	No active gassing (<= 800)

DGA Diagnostics	**Roger's Ratio**	Diagnostic not applicable - Gas levels normal.
	Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
	Duval Pentagons	Diagnostic not applicable - Gas levels normal.
	Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
	DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
	Resampling Protocol	Routine Screening
	AVO Resampling Recommendation	Resample within 1 year.

Comment:

General Oil Quality (GOQ)

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm^2/s = cSt

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TEST REPORT
01-7823074-743593-00

KPC Power Electrical Ltd	**Serial#:** 12445	**Mfr:**	**Control#:** 7823074
	Location: QL2	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 3000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1965	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** CONS	**Syringe ID:** 8007918	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **Liters:** 7850	**Sampled By:** PK	
Customer ID: T1			

		Lab Control Number:	7823074	7799721	7677033	7677032	7627738
		Date Sampled:	03/10/2025	11/29/2024	09/15/2023	09/15/2023	03/16/2023
		Order Number:	743593	737635	707885	707885	696115
		Oil Temp:	30	10	65	40	30
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	7	5	10	17	12
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	46.05	45.87	48.27	36.86	36.59
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	0.005	0.003	< 0.001	0.017	0.023
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L1.0	L1.0	L0.5	L1.0	L1.0
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS	PASS	PASS	PASS	PASS
			CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	ND	ND	ND	TRACE
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	46 (21°C)	35 (22°C)	25 (23°C)	35 (23°C)	40 (22°C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.8656	0.865	0.8656	0.856	0.8555

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Acceptable for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).
Comment:		

PCB	**Concentration (mg/kg):**	11.3 mg/kg				292.0 mg/kg
ASTM Method D-4059[1]	**PCB Type (Arocolor):**	1254-1260				1254-1260
	Reporting Limit:	1.0				1.0
Comment:						

End of Test Report

Authorized By:

JANET KAROLAT
SUPV CHEMIST

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

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TEST REPORT
01-7823071-743593-00

KPC Power Electrical Ltd	**Serial#:** 222011	**Mfr:** PORTER	**Control#:** 7823071
	Location: MORRISBURG DS1	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 5000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1976	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** SEAL	**Syringe ID:** 8006286	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **IMPGal:** 1184	**Sampled By:** PK	
Customer ID: T1			

	Lab Control Number:	7823071	7799725	7678695	7627740
	Date Sampled:	03/11/2025	11/29/2024	09/18/2023	03/16/2023
	Order Number:	743593	737635	708271	696115
	Oil Temp:	24	20	40	20
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.52	0.5	0.47	0.51
ASTM	**Transformer Age (yrs):**	49	48	47	47
D-3612[1]	**Hydrogen (H2) (µL/L):**	<2	<2	<2	<2
	Methane (CH4) (µL/L):	<1	<1	1	<1
	Ethane (C2H6) (µL/L):	<1	<1	<1	<1
	Ethylene (C2H4) (µL/L):	2	2	2	1
	Acetylene (C2H2) (µL/L):	<1	<1	<1	<1
	Carbon Monoxide (CO) (µL/L):	7	11	24	5
	Carbon Dioxide (CO2) (µL/L):	530	518	644	537
	Nitrogen (N2) (µL/L):	60348	51023	59129	60439
	Oxygen (O2) (µL/L):	31453	25490	27992	31009

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		**Gas Level Deltas(µL/L) (2 most recent samples)**		**Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)**	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	<2	Normal (<= 40)	0	Normal Variation (<= 25)	0	No active gassing (<= 10)
Methane (CH4)	0	Normal (<= 20)	0	Normal Variation (<= 10)	0	No active gassing (<= 3)
Ethane (C2H6)	0	Normal (<= 15)	0	Normal Variation (<= 7)	0	No active gassing (<= 2)
Ethylene (C2H4)	2	Normal (<= 60)	0	Normal Variation (<= 20)	0	No active gassing (<= 5)
Acetylene (C2H2)	<1	Normal (<= 2)	0	Normal Variation (<= 0)	0	No active gassing (<= 0)
Carbon Monoxide (CO)	7	Normal (<= 500)	-4		-2	No active gassing (<= 80)
Carbon Dioxide (CO2)	530	Normal (<= 5500)	12	Normal Variation (<= 1750)	-28	No active gassing (<= 800)

DGA Diagnostics **Roger's Ratio**	Diagnostic not applicable - Gas levels normal.
Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
Duval Pentagons	Diagnostic not applicable - Gas levels normal.
Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
Resampling Protocol	Routine Screening
AVO Resampling Recommendation	Resample within 1 year.

Comment:

General Oil Quality (GOQ)

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TEST REPORT
01-7823071-743593-00

KPC Power Electrical Ltd	**Serial#:** 222011	**Mfr:** PORTER	**Control#:** 7823071
	Location: MORRISBURG DS1	**kV:** 44	**Order#:** 743593
	Equipment: TRANSFORMER	**kVA:** 5000	**Account:** 6541
AJAX, ON L1S 6M6 CA	**Compartment:** MAIN(BOTTOM)	**Year Mf'd:** 1976	**Received:** 03/13/2025
ATTN: SAMANTHA MACKEY	**Breathing:** SEAL	**Syringe ID:** 8006286	**Reported:** 03/24/2025
PO#: 25IM-5107	**Bank:** **Phase:** 3	**Bottle ID:**	
Project ID:	**Fluid:** MIN **IMPGal:** 1184	**Sampled By:** PK	
Customer ID: T1			

		Lab Control Number:	7823071	7799725	7678695	7627740
		Date Sampled:	03/11/2025	11/29/2024	09/18/2023	03/16/2023
		Order Number:	743593	737635	708271	696115
		Oil Temp:	24	20	40	20
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	9	4	7	10
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	40.0	38.69	39.99	38.4
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	0.009	0.008	0.008	0.012
ASTM D-1500[1]	**Color Number**	**(ASTM):**	L1.0	L1.0	L1.0	L0.5
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	FAIL	PASS	PASS	PASS
			H2O	CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	ND	ND	ND
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	47 (21°C)	47 (23°C)	21 (22°C)	64 (22°C)
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.858	0.8568	0.8574	0.857

GOQ Diagnostics	**Moisture in Oil:**	Acceptable for in-service oil (35 mg/kg max).
PER IEEE C57.106-2015	**Interfacial Tension:**	Acceptable for in-service oil (25 mN/m min).
(most recent sample)	**Acid Number:**	Acceptable for in-service oil (0.2 mg KOH/g max).
	Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
	Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).

Comment:

PCB	**Concentration (mg/kg):**	< 1.0 mg/kg
ASTM Method D-4059[1]	**PCB Type (Arocolor):**	ND
	Reporting Limit:	1.0

Comment:

End of Test Report

Authorized By:

JANET KAROLAT
SUPV CHEMIST

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Subcontracted laboratory has received ISO Standard 17025 accreditation for this test. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

KPC Power

A DIVISION OF KPC UTILITY SOLUTIONS GROUP

Appendix A

RSLU - Substation Condition Assessment

Substation	CARDINAL DS1
Address	715 County Rd. #2, Cardinal, ON

Transformers

Transformers Data

Device #	Manufacturer	Primary Voltage (kV)	Primary Config.	Secondary Voltage (V)	Secondary Config.	Size (kVA)	Age	Refurb.
T1	Brown Boveri	44	Delta	4160	Wye	3000	72	N/A

Condition Assessment

Device #	Mechanical	TTR	Winding Resistance	DAT	Cap.	DGA	Spare	Overall
T1	2	4	1	2	1	4	1	2.8

Comments: Low oil level in conservator tank, significant rust present on surface of the TX.

Switching Equipment

	Switching Equipment Data							Fuse Equipment Data			
Device #	Manufacturer	Nom. Voltage (kV)	Max. Voltage (kV)	Age	Refurb.	Rating (A)	Load Break (Y/N)	Fuseholder	Fuse Type	Fuse Size	Spare Qty
23T1L-X	Delta Star	46	48.3	N/A	N/A	600	N	S&C SMD-2C	Tower Mount	65E	3
23F1	S&C	4.16	4.8	9	N/A	600	Y	S&C SM-5	SM5	400E	6
23F2	S&C	4.16	4.8	9	N/A	600	Y	S&C SM-5	SM5	400E	6

Comments: TX replacement scheduled already. Main 44kV pole is split and highly aged. Low tension on the line as an in-line pole, though recommend replacement for reliability (if possible during TX replacement)

Condition Assessment

Device #	Mech. Op.	Insulation Res.	Contact Res.	Fuse Res.	Spares	Overall
23TIL-X	4	4	5	4	4	4.29
23F1	5	5	4	4	4	4.29
23F2	5	3	4	4	4	4.00

Comments:
-23TIL-X not tested due to use as isolation point. Scoring provided herein is assumed from the 2018 Condition Assessment. Recommend new maintenance activity to include isolation from Hydro One for switch testing.

Station Infrastructure Score

	Condition	Comments
Building	4	
Fencing	4	
Ground Grid	3	Recommend weed treatment, maintenance of grid surface.
Structures	5	
Foundations	5	
Security	3	Lock is old and needs to be updated with RSLU standard.
Safety	3	
Conductors	5	
Redundancy	4	
Total Score	3.32	

Recommendations:
Ground grid should be topped up with new crushed stone with weed treatment.
Consider replacement of Cardinal DS1 or DS2 transformer due to age.

Substation	CARDINAL DS2
Address	3039 John St., Cardinal, ON

Transformers

Device #	Manufacturer	Primary Voltage (kV)	Primary Config.	Secondary Voltage (V)	Secondary Config.	Size (kVA)	Age	Refurb.
	Transformers Data							
T2	Maloney Electric Co.	44kV	Delta	4160	Wye	3000	73	N/A

Comments: TX Liquid temperature gauge not functional, gasket is highly aged. Sign of oil leak.

Condition Assessment

Device #	Mechanical	TTR	Winding Resistance	DAT	Cap.	DGA	Spare	Overall
T2	3	5	3	3	1	2	1	2.1

Comments: Cracked X3 recommended to be replaced. Continue DGA on 6 month cycle.

Switching Equipment

	Switching Equipment Data							Fuse Equipment Data			
Device #	Manufacturer	Nom. Voltage	Max. Voltage	Age	Refurb.	Rating (A)	Load Break (Y/N)	Fuseholder	Fuse Type	Fuse Size	Spare Qty
CS2-T2-L	Kearny	46kV	48.3kV	N/A	N/A	600	Y	S&C SMD-2C	S&C SMD-2C	65E	Yes
33F4	S&C	4.2kV	4.8kV	29	N/A	600	Y	S&C SM5S	S&C SM-5S	300E	4
33F5	S&C	4.2kV	4.8kV	29	N/A	600	Y	S&C SM5S	S&C SM-5S	300E	Yes

Comments: CS2-T2-L fuse barrel severely weathered, corroded lug connections, no spare fuses.

Condition Assessment

Device #	Mech. Op.	Insulation Res.	Contact Res.	Fuse Res.	Spares	Overall
CS2-T2-L	4	2	4	3	4	3.43
33F4	2	3	4	5	4	3.86
33F5	2	5	2	3	4	3.00

Comments: CS2-T2-L (Namplate is faded, CR is high). No insulation resistance testing done on CS2-T2-L, recommend to test next time with isolation from Hydro One.

Station Infrastructure Score

	Condition	Comments
Building	5	No building.
Fencing	2	Fence is out of alignment and shorter than current code requirements. Signage is faded. Cross members also snapped.
Ground Grid	4	
Structures	4	
Foundations	5	
Security	3	Should change to RSLU lock as old lock from previous utility
Safety	5	
Conductors	4	
Redundancy	4	
Total Score	2.75	

Recommendations:
Fence should be replaced or maintained to restore physical security of the substation.
Consider replacement of Cardinal DS1 or DS2 transformer due to age.

Substation	IROQUOIS DS
Address	5799 Carman Rd., Iroquois, ON

	Transformers							
	Transformers Data							
Device #	Manufacturer	Primary Voltage (kV)	Primary Config.	Secondary Voltage (kV)	Secondary Config.	Size (kVA)	Age	Refurb.
T1	Brown, Boveri & Cie	44	Delta	8.32/4.16	Wye	3000	72	N/A
T2	Northern Transformer	44	Delta	8.32/4.16	Wye	3000	15	N/A
Comments: T1 is unloaded spare. Maintenance report should identify TX configurations.								

	Condition Assessment							
Device #	Mechanical	TTR	Winding Resistance	DAT	Cap.	DGA	Spare	Overall
T1	1	5	5	3	1	4	4	3.7
T2	5	5	5	5	1	4	4	4.1
Comments: T1 tank is out of oil due to oil leak.								

	Switching Equipment										
	Switching Equipment Data							Fuse Equipment Data			
Device #	Manufacturer	Nom. Voltage (kV)	Max. Voltage (kV)	Age	Refurb.	Rating (A)	Load Break (Y/N)	Fuseholder	Fuse Type	Fuse Size	Spare Qty
T1-L	Eastern Power	44	46	66	N/A	600	N	S&C BMD	S&C 119-1	100E	Yes
T2-L	S&C Electric	44	46	N/A	N/A	600	Y	S&C SMD-2C	Power Fuse	100E	Yes
11-F1	S&C Alduti Rupter	7.2	8.3		N/A	600	Y	S&C	SM-5	200A	Yes
PADMOUNT Switchgear	S&C	13.8	15	8	N/A	600	Y	S&C		200A	Yes
Comments: 11-F1 and Padmount switchgear were not included in 2024 KPC report.											

4

	Condition Assessment					
Device #	Mech. Op.	Insulation Res.	Contact Res.	Fuse Res.	Spares	Overall
T1-L	3	5	3	2	4	3.14
T2-L	5	3	3	4	4	3.71
11-F1	4	2	4	4	4	3.71
PADMOUNT	5	4	5	5	4	4.71
Comments: -No test data provided for the padmount, assumed similar results to 2018 testing. -No insulation testing performed on 11-F1.						

	Recloser(s)						
	Switching Equipment Data						
Device #	Manufacturer	Nom. Voltage	Max. Voltage	Age	Refurb.	Rating (A)	Rating (MV,sym)
11F2	McGraw Edison	4800	8320	2	N/A	100A	5 KA
Comments: Recloser change (2023), New recloser is missing operating mechanism.							

	3.32				
Device #	Ops. Counter	Mech. Op.	Contact Res. (Closed)	Contact Res. (Open)	Overall
11F2	N/A	5	5	5	5
Comments: New recloser, default score of 5.					

Station Infrastructure Score		
	Condition	Comments
Building	3	Rusty storage container
Fencing	3	Gap at gate
Ground Grid	2	Requires maintenance to eliminate weeds
Structures	4	
Foundations	3	Deteoroation of a footing for the lattice structure to be addressed.
Security	3	Gap at gate
Safety	3	
Conductors	4	
Redundancy	4	T1 is unloaded backup to T2.
Total Score	3.82	

Substation	Morrisburg MS1
Address	11 Fifth Street East, Morrisburg, ON

Transformers

	Transformers Data							
Device #	Manufacturer	Primary Voltage (kV)	Primary Config.	Secondary Voltage	Secondary Config.	Size (kVA)	Age	Refurb.
T1	HK Porter Company Canada LTD	44	Delta	4160	Wye	5000	49	N/A

Condition Assessment

Device #	Mechanical	TTR	Winding Resistance	DAT	Cap.	DGA	Spare	Overall
T1	3	5	3	3	4	4	1	3.25

Comments: Rusted top, conduit, control box. Signs of new oil leak.

Switching Equipment

	Switching Equipment Data							Fuse Equipment Data			
Device #	Manufacturer	Nom. Voltage (kV)	Max. Voltage (kV)	Age	Refurb.	Rating (A)	Load Break (Y/N)	Fuseholder	Fuse Type	Fuse Size	Spare Qty
46T1-L	Easton Power Devices	46	48.3	1	2024	600	N	S&C SMD	S&C SMD-1A	150E	3
46F1	S&C	7.2	27	N/A	N/A	600	Y	Kyle Recloser	WV-27	N/A	N/A
46F2	S&C	7.2	15.5	N/A	N/A	600	Y	Kyle Recloser	WV-27	N/A	N/A
46F3	S&C	7.2	27	N/A	N/A	600	Y	Kyle Recloser	WV-27	N/A	N/A

Comments:

Condition Assessment

Device #	Mech. Op.	Insulation Res.	Contact Res.	Fuse Res.	Spares	Overall
46T1-L	5	3	4	3	4	3.71
46F1	5	3	4	5	5	4.43
46F2	5	3	3	5	5	4.14
46F3	0	5	4	4	5	3.71

Comments: 46T1-L high contact resistance on A & B phases, continue to monitor. No operating mechanisms for the reclosers. 46F3 is cracked.

Station Infrastructure Score

	Condition	Comments
Building	2	Storage shed is leaning, however not critical to operations.
Fencing	4	Relatively new.
Ground Grid	3	Recommend weed treatment
Structures	4	
Foundations	4	
Security	3	Fence gate has large gap when closed.
Safety	5	
Conductors	4	
Redundancy	4	
Total Score	3.51	

Recommendations: Old lock from previous utility, should change to RSLU lock

Substation	Morrisburg MS2
Address	11 Fifth Street East, Morrisburg, ON

	Transformers							
	Transformers Data							
Device #	Manufacturer	Primary Voltage (kV)	Primary Config.	Secondary Voltage (kV)	Secondary Config.	Size (kVA)	Age	Refurb.
T2	Stein Industries	44	Delta	4.16/2.4	Wye Ground	5000	2	N/A

	Condition Assessment							
Device #	Mechanical	TTR	Winding Resistance	DAT	Cap.	DGA	Spare	Overall
T2	5	5	5	5	5	5	1	4.2

	Switching Equipment										
	Switching Equipment Data							Fuse Equipment Data			
Device #	Manufacturer	Nom. Voltage (kV)	Max. Voltage (kV)	Age	Refurb.	Rating (A)	Load Break (Y/N)	Fuseholder	Fuse Type	Fuse Size	Spare Qty
46T2-L	S&C	44	48.3	2	N/A						

	Condition Assessment					
Device #	Mech. Op.	Insulation Res.	Contact Res.	Fuse Res.	Spares	Overall
46T2-L						0.00

	Recloser(s)						
	Switching Equipment Data						
Device #	Manufacturer	Nom. Voltage	Max. Voltage	Age	4	Rating (A)	Rating (MV,sym)
MS2-F1							
MS2-F2							
MS2-F3							
Comments: Recloser change (2023), New recloser is missing operating mechanism.							

	Condition Assessment				
Device #	Ops. Counter	Mech. Op.	Contact Res. (Closed)	Contact Res. (Open)	Overall
MS2-F1	N/A	5	5	5	5
MS2-F2	N/A	5	5	5	5
MS2-F3	N/A	5	5	5	5
Comments: New recloser, default score of 5.					

Station Infrastructure Score		
	Condition	Comments
Building	2	Storage shed is leaning, however not critical to operations.
Fencing	4	Relatively new. Vegetation overgrowth from neighbouring property
Ground Grid	3	Recommend weed treatment
Structures	4	
Foundations	4	
Security	3	Fence gate has large gap when closed.
Safety	5	
Conductors	4	
Redundancy	4	
Total Score	4.28	

Substation	Prescott MS1
Address	675 Corrine St, Prescott, ON
Designation	QL2

	Transformers							
	Transformers Data							
Device #	Manufacturer	Primary Voltage (kV)	Primary Config.	Secondary Voltage (kV)	Secondary Config.	Size (kVA)	Age	Refurb.
B20IT1-X	Ferranti Packard	44	Delta	4.8	Wye	3000	60	N/A

	Condition Assessment							
Device #	Mechanical	TTR	Winding Resistance	DAT	Cap.	DGA	Spare	Overall
B20IT1-X	4	4	4	3	3	4	1	3.25
Comments: Oil leak visible on bottom of TX. Nameplate is faded.								

	Switching Equipment										
	Switching Equipment Data							Fuse Equipment Data			
Device #	Manufacturer	Nom. Voltage (kV)	Max. Voltage (kV)	Age	Refurb.	Rating (A)	Load Break (Y/N)	Fuseholder	Fuse Type	Fuse Size	Spare Qty
Tower Switch	Dominion Cutout	44	48.3	N/A	N/A	600	Y	S&C SMD-50	SMD-50	100E	Yes
MAIN	S&C	4.2	4.8	N/A	N/A	600	Y	N/A	N/A	N/A	Yes
2F1-B	S&C	4.2	4.8	N/A	N/A	600	Y	S&C SMD-40	SMU-40	250E	Yes
2F2-B	S&C	4.2	4.8	N/A	N/A	600	Y	S&C SMD-40	SMU-40	250E	Yes
2F3-B	S&C	4.2	4.8	N/A	N/A	600	Y	S&C SMD-40	SMU-40	250E	Yes

	Condition Assessment					
Device #	Mech. Op.	Insulation Res.	Contact Res.	Fuse Res.	Spares	Overall
Tower Switch	4	3	4	4	4	3.86
MAIN	5	3	5	5	4	4.57
2F1-B	5	3	5	5	4	4.57
2F2-B	5	3	5	5	4	4.57
2F3-B	5	3	5	5	4	4.57
Comments: High voltage fuses are bent, should be replaced. No Insulation resistance values in any report, assumption of 3 is given.						

Station Infrastructure Score		
	Condition	Comments
Building	4	
Fencing	4	
Ground Grid	4	
Structures	4	
Foundations	4	
Security	4	
Safety	5	
Conductors	5	No test reports available, score from previous report used
Redundancy	4	
Total Score	3.66	

Substation	Prescott MS2
Address	103 Churchill East, Prescott, ON
Designation	QL20

	Transformers							
	Transformers Data							
Device #	Manufacturer	Primary Voltage (kV)	Primary Config.	Secondary Voltage (kV)	Secondary Config.	Size (kVA)	Age	Refurb.
T1	Reliance Power Equipment	44	Delta	4.16/2.4	Wye Ground	5000	33	N/A

	Condition Assessment							
Device #	Mechanical	TTR	Winding Resistance	DAT	Cap.	DGA	Spare	Overall
T1	4	4	4	3	2	4	1	3.2
Comments: Main TX oil temperature gauge not functioning.								

Station Infrastructure Score		
	Condition	Comments
Building	3	
Fencing	3	Leaning losts, gate misaligned, gap under fence
Ground Grid	3	vegetation management and stone top up required
Structures	3	
Foundations	4	
Security	3	
Safety	4	
Conductors	4	No new report, previous test report/score
Redundancy	4	
Total Score	2.66	

Substation	Prescott MS3
Address	103 Churchill East, Prescott, ON
Designation	QL40

	Transformers							
	Transformers Data							
Device #	Manufacturer	Primary Voltage (kV)	Primary Config.	Secondary Voltage (kV)	Secondary Config.	Size (kVA)	Age	Refurb.
T1	Archer	44	Delta	4.16/2.4	Wye	5000	61	N/A

	Condition Assessment							
Device #	Mechanical	TTR	Winding Resistance	DAT	Cap.	DGA	Spare	Overall
T1	3	5	5	3	1	4	1	3.2
Comments: oil temp guage not working, will not reset.								

	Switching Equipment											
	Switching Equipment Data							Fuse Equipment Data				
Device #	Manufacturer	Nom. Voltage (kV)	Max. Voltage (kV)	Age	Refurb.	Rating (A)	Load Break (Y/N)	Fuseholder	Fuse Type	Fuse Size	Spare Qty
Incoming Tower Fuses	Canadian Line Material	46		N/A	N/A	600	Y	S&C	S&C	80E	Yes
40-F1	S&C Electric BS	7.5		N/A	N/A	400	Y	S&C	SMD-1	400E	2
40-F2	S&C Electric BS	7.5		N/A	N/A	400	Y	S&C	SMD-1	400E	2
40-F3	S&C Electric BS	7.5		N/A	N/A	400	Y	S&C	SMD-1	400E	Yes

	Condition Assessment					
Device #	Mech. Op.	Insulation Res.	Contact Res.	Fuse Res.	Spares	Overall
Incoming Tower Fuses	4	3	5	5	4	4.43
40-F1	2	5	4	4	4	3.86
40-F2	3	5	5	3	4	4.00
40-F3	3	5	4	2	4	3.43
Comments: Replace the faulty arcing interrupters. Replace faulty contact surfaces of 40-F1						

Station Infrastructure Score		
	Condition	Comments
Building	3	
Fencing	2	Fence maintenance required.
Ground Grid	3	Vegetation management and stone top up required
Structures	3	Signs of rust.
Foundations	3	
Security	3	
Safety	3	
Conductors	4	
Redundancy	4	
Total Score	3.41	

Substation	Prescott MS4
Address	800 Boundary Rd., Prescott, ON
Designation	QL30

	Transformers							
	Transformers Data							
Device #	Manufacturer	Primary Voltage (kV)	Primary Config.	Secondary Voltage (kV)	Secondary Config.	Size (kVA)	Age	Refurb.
T1 - 2L30	Reliance Power	44	Delta	4.16/2.4	Wye-G	5000	34	N/A

	Condition Assessment							
Device #	Mechanical	TTR	Winding Resistance	DAT	Cap.	DGA	Spare	Overall
T1 - 2L30	2	5	1	4	1	4	1	3.05
Comments: Max. needle in winding temperature gauge missing. Minor oil leaks from secondary red phase bushings.								

	Switching Equipment										
	Switching Equipment Data							Fuse Equipment Data			
Device #	Manufacturer	Nom. Voltage (kV)	Max. Voltage (kV)	Age	Refurb.	Rating (A)	Load Break (Y/N)	Fuseholder	Fuse Type	Fuse Size	Spare Qty
H20IT-L	S&C	44	46	39	N/A	600	Y	Dominion	N/A	N/A	X2 65A, X2 125A
30F1 Reclosure	Kyle Reclosure	14.4	15.5	33	N/A	400					
30F2 Reclosure	Kyle Reclosure	14.4	15.5	33	N/A	400					

	Condition Assessment					
Device #	Mech. Op.	Insulation Res.	Contact Res.	Fuse Res.	Spares	Overall
H20IT-L	4	2	5	4	4	4.00
30F1 Reclosure	4	5	3	5	5	4.29
30F2 Reclosure	4	3	5	5	5	4.57
Comments: Low insulation resistance on 'C' phase of 30F2. Minor recloser leak (30F1 through eyeglass location, 30F2 through sampling valve)						

Station Infrastructure Score		
	Condition	Comments
Building	5	No building
Fencing	4	
Ground Grid	4	Some weed growth near foundation, recommend vegetation management and weed spray.
Structures	3	Rust
Foundations	4	
Security	3	
Safety	5	
Conductors	2	Low insulation resistance on phase C of 30F2, further investigation is recommended.
Redundancy	4	
Total Score	3.46	