Year-End 2019 BUDGET TO ACTUALS

February 11, 2020
At the year-end 2019, O&M has spent 94% of its annual budget target, while Labor has spent right at 102% of its target.

- As a comparison, at year-end of 2018 the O&M spent was 100% of budget and Labor was 101% of budget.

Capital is at 86% of total 2019 budget target at year-end. Total 2019 Capital spending was $100.2M, which was $16.7M under budget.

- As a comparison, at year-end of 2018, Capital spent was at 91% of its budget target. Total 2018 Capital spending was $99.6M, which was $9.9M under budget.

Year End net direct charges (O&M, Labor, Capital) are less than the 2019 budget by $18.1M, which is due primarily to lower than planned Capital spending.

### 2019 DIRECTS YEAR-END PROJECTION OVERVIEW

<table>
<thead>
<tr>
<th></th>
<th>2019 Budget</th>
<th>2019 YTD</th>
<th>% of Annual Budget</th>
<th>2019 Year-End Projection</th>
<th>YEP Variance $</th>
<th>YEP Variance %</th>
<th>Under Budget / Over Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct O&amp;M</td>
<td>$ 53,571,106</td>
<td>$ 50,440,469</td>
<td>94%</td>
<td>$ 50,440,469</td>
<td>$(3,130,637)</td>
<td>-6%</td>
<td>Under Budget</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>$ 70,696,771</td>
<td>$ 72,430,573</td>
<td>102%</td>
<td>$ 72,430,573</td>
<td>$ 1,733,802</td>
<td>2%</td>
<td>Over Budget</td>
</tr>
<tr>
<td>Direct Capital</td>
<td>$ 116,956,793</td>
<td>$ 100,241,960</td>
<td>86%</td>
<td>$ 100,241,960</td>
<td>$(16,714,833)</td>
<td>-14%</td>
<td>Under Budget</td>
</tr>
<tr>
<td>2019 Directs Total</td>
<td>$ 241,224,670</td>
<td>$ 223,113,001</td>
<td>92%</td>
<td>$ 223,113,001</td>
<td>$(18,111,668)</td>
<td>-8%</td>
<td>Under Budget</td>
</tr>
</tbody>
</table>
• At year-end 2019, Direct O&M has spent 94% of its annual budget target.
  • As a comparison, at the year-end 2018, Direct O&M spending was at 100% of the budget target.

• The Chief Customer Officer group: Customer Solutions down $300k, Rates & Pricing up $216k, Large Power Solutions up $410k, Wholesale Marketing up $160k, and Organization Dev. up $143k.

• The Chief Operations Officer group: Power Production down $2.9M, which is primarily Fish & Wildlife down $2.3M, and PP Engineering down $0.9M and Eng. Safety up $0.8M, Power Delivery up $1.0M.

• The Chief Financial Officer group: IT down $460k, FP&A up $249k, Internal Services down $1.0M, and Risk/Audit down $193k.
At the year-end 2019, the FTR head count is above budget target and FTE head count is above the budget target. FTR head count, as of Pay Period ending 12/12/2019, was 633.

For comparison, FTR head count was 592 at the close of 2018.

FTE is a cumulative figure that reflects part-time and seasonal employees.

For comparison, the FTE utilization at close of 2018 was 19% over the 2018 budget.

The Overtime Year End Projection is 41% (~$2.3M) over budget. Overtime is both event-dependent and used to partially cover insufficient FTR.

For comparison, at Year End 2018 Overtime was 31% or $1.35M over budget.
At year-end 2019, Direct Labor has spent 102% of its annual budget target. For comparison, at the year-end 2018, Direct Labor spending was at 101% of the budget target.

The Chief Customer Officer group: CCO office up $265k.

The Chief Operations Officer group: COO office up $2.1M, Power Delivery (PD) up $420k.

The Chief Financial Officer group: CFO office up $465k, FP&A down $276k, Internal Services down $487k, Finance/Accounting down $240k.

<table>
<thead>
<tr>
<th>Department</th>
<th>Functional Area</th>
<th>2019 Labor Budget</th>
<th>2019 Labor YTD</th>
<th>YTD % of Annual Budget</th>
<th>2019 Labor YEP</th>
<th>YEP Variance $</th>
<th>YEP Variance %</th>
<th>Under Budget / Over Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA0000</td>
<td>Board of Commission</td>
<td>$152,139</td>
<td>$190,998</td>
<td>126%</td>
<td>$190,998</td>
<td>$38,859</td>
<td>26%</td>
<td>Over Budget</td>
</tr>
<tr>
<td>BA0000</td>
<td>General Manager</td>
<td>$707,837</td>
<td>$638,800</td>
<td>90%</td>
<td>$638,800</td>
<td>$(69,038)</td>
<td>-10%</td>
<td>Under Budget</td>
</tr>
<tr>
<td>CA0000</td>
<td>Attorney</td>
<td>$362,848</td>
<td>$377,536</td>
<td>104%</td>
<td>$377,536</td>
<td>$14,688</td>
<td>4%</td>
<td>Over Budget</td>
</tr>
<tr>
<td>DA0000</td>
<td>Chief Customer Officer</td>
<td>$5,849,323</td>
<td>$6,219,024</td>
<td>106%</td>
<td>$6,219,024</td>
<td>$369,701</td>
<td>6%</td>
<td>Over Budget</td>
</tr>
<tr>
<td>EA0000</td>
<td>Chief Operating Officer</td>
<td>$49,925,854</td>
<td>$51,917,662</td>
<td>104%</td>
<td>$51,917,662</td>
<td>$1,991,807</td>
<td>4%</td>
<td>Over Budget</td>
</tr>
<tr>
<td>FA0000</td>
<td>Chief Financial Officer</td>
<td>$13,552,182</td>
<td>$12,940,067</td>
<td>95%</td>
<td>$12,940,067</td>
<td>$(612,115)</td>
<td>-5%</td>
<td>Under Budget</td>
</tr>
<tr>
<td>GA0000</td>
<td>Merchant Wholesale Telecom</td>
<td>$146,587</td>
<td>$146,487</td>
<td>100%</td>
<td>$146,487</td>
<td>$(100)</td>
<td>0%</td>
<td>Under Budget</td>
</tr>
</tbody>
</table>

$70,696,771 | $72,430,573 | 102% | $72,430,573 | $1,733,802 | 2% | Over Budget |

2/5/2020
## 2019 YEAR-END DIRECT CAPITAL BY PROJECT

<table>
<thead>
<tr>
<th>Project Title</th>
<th>2019 Budget</th>
<th>2019 YTD</th>
<th>YTD % of Annual Budget</th>
<th>2019 YEP</th>
<th>YEP Variance</th>
<th>Under Budget / Over Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR Turbine Upgrade</td>
<td>$18,011,594</td>
<td>$21,084,464</td>
<td>117%</td>
<td>$21,084,464</td>
<td>$3,072,871</td>
<td>Over Budget</td>
</tr>
<tr>
<td>Fiber Expansion</td>
<td>$15,300,000</td>
<td>$12,801,467</td>
<td>84%</td>
<td>$12,801,467</td>
<td>(2,498,533)</td>
<td>Under Budget</td>
</tr>
<tr>
<td>PR Generator Rewind</td>
<td>$11,052,111</td>
<td>$7,926,134</td>
<td>72%</td>
<td>$7,926,134</td>
<td>(3,125,977)</td>
<td>Under Budget</td>
</tr>
<tr>
<td>PR Embankment Improvements</td>
<td>$8,792,000</td>
<td>$2,083,296</td>
<td>24%</td>
<td>$2,083,296</td>
<td>(6,708,704)</td>
<td>Under Budget</td>
</tr>
<tr>
<td>PR Spillway Stability Improvements</td>
<td>$5,850,000</td>
<td>$1,441,566</td>
<td>25%</td>
<td>$1,441,566</td>
<td>(4,408,434)</td>
<td>Under Budget</td>
</tr>
<tr>
<td>WAN Generator Upgrade</td>
<td>$5,771,290</td>
<td>$7,006,513</td>
<td>121%</td>
<td>$7,006,513</td>
<td>1,235,222</td>
<td>Under Budget</td>
</tr>
<tr>
<td>WAN Spillgate Rehab</td>
<td>$4,115,940</td>
<td>$3,757,408</td>
<td>91%</td>
<td>$3,757,408</td>
<td>(358,532)</td>
<td>Under Budget</td>
</tr>
<tr>
<td>Randolph Road Substation Expansion - Substation</td>
<td>$3,896,222</td>
<td>$3,113,296</td>
<td>80%</td>
<td>$3,113,296</td>
<td>(782,926)</td>
<td>Under Budget</td>
</tr>
<tr>
<td>Broadband Customer Connectivity</td>
<td>$3,100,000</td>
<td>$5,365,170</td>
<td>173%</td>
<td>$5,365,170</td>
<td>2,265,170</td>
<td>Over Budget</td>
</tr>
<tr>
<td>Fleet Replacement Program</td>
<td>$2,810,000</td>
<td>$3,603,682</td>
<td>128%</td>
<td>$3,603,682</td>
<td>793,682</td>
<td>Over Budget</td>
</tr>
<tr>
<td>Class 4000 breakout - Distribution Feeder Lines</td>
<td>$2,750,000</td>
<td>$2,553,687</td>
<td>93%</td>
<td>$2,553,687</td>
<td>(196,313)</td>
<td>Under Budget</td>
</tr>
<tr>
<td>10.13 Firewall Replacements</td>
<td>$2,653,132</td>
<td>$1,063,746</td>
<td>40%</td>
<td>$1,063,746</td>
<td>(1,589,386)</td>
<td>Under Budget</td>
</tr>
<tr>
<td>9.1 Access Control and Video Management System</td>
<td>$2,267,056</td>
<td>$567,333</td>
<td>25%</td>
<td>$567,333</td>
<td>(1,699,723)</td>
<td>Under Budget</td>
</tr>
<tr>
<td>Mountain View Lineups 10 &amp; 20</td>
<td>$2,193,566</td>
<td>$4,030,280</td>
<td>184%</td>
<td>$4,030,280</td>
<td>1,836,714</td>
<td>Over Budget</td>
</tr>
<tr>
<td>11.1 ESRI ArcGIS Implementation for Power Delivery</td>
<td>$2,009,004</td>
<td>$22,405</td>
<td>1%</td>
<td>$22,405</td>
<td>(1,986,598)</td>
<td>Under Budget</td>
</tr>
</tbody>
</table>

| Total                                             | $116,956,793 | $100,241,960 | 86% | $100,241,960 | (16,714,833) | Under Budget |

- The table shows projects with a $2M or larger budget. As of year-end 2019, Direct Capital spending is at 86% of targeted budget.
- At the year-end 2018, Capital spending was at 91% of budget.
2019 YEAR-END PROJECTION LOADED O&M & CAPITAL

<table>
<thead>
<tr>
<th>Year End Projection Components</th>
<th>O&amp;M</th>
<th>Capital</th>
<th>Labor</th>
<th>Benefits*</th>
<th>Capitalized G&amp;A</th>
<th>Inventory</th>
<th>Loaded YEP†</th>
</tr>
</thead>
<tbody>
<tr>
<td>O&amp;M Elec</td>
<td>$ 19,579,243</td>
<td>$</td>
<td>-</td>
<td>$ 25,529,864</td>
<td>$ 10,146,655</td>
<td>$(2,699,100)</td>
<td>$(1,576,573)</td>
</tr>
<tr>
<td>O&amp;M PRP</td>
<td>$ 30,861,226</td>
<td>$</td>
<td>-</td>
<td>$ 34,401,828</td>
<td>$ 13,672,751</td>
<td>$(3,261,705)</td>
<td>$</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>$ 50,440,469</td>
<td>$</td>
<td>-</td>
<td>$ 59,931,692</td>
<td>$ 23,819,406</td>
<td>$(5,960,804)</td>
<td>$(1,576,573)</td>
</tr>
<tr>
<td>Cap Elec</td>
<td>$</td>
<td>$ 46,437,490</td>
<td>$ 5,739,748</td>
<td>$ 2,281,220</td>
<td>$ 2,699,100</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Cap PRP</td>
<td>$</td>
<td>$ 53,804,470</td>
<td>$ 6,759,132</td>
<td>$ 2,686,367</td>
<td>$ 3,261,705</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Capital</td>
<td>$</td>
<td>$ 100,241,960</td>
<td>$ 12,498,881</td>
<td>$ 4,967,587</td>
<td>$ 5,960,804</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Total Expenditures</td>
<td>$ 50,440,469</td>
<td>$ 100,241,960</td>
<td>$ 72,430,573</td>
<td>$ 28,786,993</td>
<td>$</td>
<td>$(1,576,573)</td>
<td>$ 250,323,421</td>
</tr>
</tbody>
</table>

†other factors will influence the O&M & Labor loaded YEPs in Financial Forecast such as other revenues & expenses

- Total O&M, Capital, and Labor figures are solid, but the Elec / PRP splits and Benefits figures are preliminary
- Year-End labor splits 83% O&M / 17% Capital
- 2019 Budget labor splits 78% O&M / 22% Capital
Questions?
Construction and Maintenance Update
February 2020

Powering our way of life.
Results Driven Achievements from C&M for 2019

Issue: Pole fires (wood poles) have been a prevalent issue to the District’s reliable service for many years

Task: Identify cause and develop a mitigation plan

Solution: Specific utility pole hardware and installation practices contribute to pole fires. These installations either allowed voltage creep across metal mounting brackets or included non-vertically installed porcelain fuse holders that increased the likelihood of contamination and insulator flashover. Current standard fiberglass and polymer hardware were procured. Line crews have upgraded 536 of each, brackets and insulators. This will be a multi-year effort.

Results: Results of these efforts are very weather dependent. Weather data, along with other conditions that are factors of pole fires can be difficult to formulize. As seasonal weather is experienced and more upgrades are completed, we hope to see a noticeable reduction in pole fires.
Results Driven Achievements from C&M for 2019

Issue: Lack of an electronic asset database, need for capturing more comprehensive information when performing substation maintenance and inspections, and need to replace an unsupported Microsoft Access process.

Task: Customize and populate MinMax software to fulfill many C&M needs

Solution: C&M staff worked tirelessly with the developers of MinMax to design data structure and processes to allow MinMax to function as a repository for C&M maintenance and assets. Once designed, historical asset data from all substations was loaded. To date, there have been over 294,881 data points that were populated in MinMax. The next phase of this project will incorporate line assets and require the incorporation of thousands of additional data points. Configuration of hand-held iPads was completed so that crews can utilize mobile devices to update activities from the field. Reporting processes will continue to be developed to allow data to be presented in various formats throughout Power Delivery.

Results: A comprehensive data set is now available and maintained. Crews utilize hand-held devices to access data and resources in the field. Data uploaded from the field can be immediately accessed on the system. Data and reports are used by Dispatch to assist in emergency operations. Reports and data from MinMax are also proving to be a more efficient means to provide required maintenance evidence in support of NERC Reliability Standard PRC-005.
Results Driven Achievements from C&M for 2019

Issue: The District has spent hundreds of millions of dollars in past years to address tree trimming needs. The vast majority of these costs were re-occurring costs as trimmed trees grow and require subsequent trimming.

Task: Determine a more economical means to address tree trimming while preserving system reliability and maintaining compliance with NERC Reliability Standard FAC-003 4.

Solution: The C&M Department has determined that obtaining owner permission to remove trees at District expense is more economical than annually trimming the same trees. As such, tree removal emphasis has been increased with each successive tree trimming contract since 2017. The most recent tree trimming contract was expanded from an annual contract to a 2-year contract. This reduced overhead costs of administering an annual contract and allowed for potential bidders to provide more competitive bids due to a longer contract duration. Although the recent bid solicitation resulted in one submitted bid, the sense that competition is present may have influenced the bid price submitted.

Results: The long-term savings of tree removal are beginning to be realized as trimming crews this year will have slightly fewer trees to trim, allowing more emphasis on additional removals.
**Results Driven Achievements from C&M for 2019**

Issue: The District was performing meter reading with 10 full-time meter readers that physically visited each meter throughout the county. Some meter reads were “estimated” due to account classification, access,…

Task: Determine a more economical means to perform accurate meter reading tasks.

Solution: The Advanced Metering Infrastructure (AMI) project involved replacing the District’s nearly 52,000 meters with electronic meters capable of communicating reads to a meter system. This approximately $15 million dollar project was an investment in revenue sourcing, customer service, system reliability, economic efficiency, and safety. This new system provides accurate real-time meter data (eliminating estimated reads), allows for remote disconnects and service trouble shooting, provides more privacy to customers, and has eliminated crew exposure to dangerous customer environments such as trip hazards, dangerous animals, and other safety concerns. C&M staff worked tirelessly with the MinMax software producers and the District’s IT staff, without using 3rd party consultants nor additional development expenses, to develop a meter exchange program to transport meter data and support the AMI project. Leveraging additional value-added benefits of this system will be pursued as manpower allows.

Results: The District can now safety acquire timely, accurate meter reads in addition to value added services.
Results Driven Achievements from C&M for 2019

Issue: The District was performing substation inspections utilizing a manual, labor intensive and time consuming process.

Task: Determine a more efficient means to perform substation inspections.

Solution: C&M staff worked with MinMax developers to utilize their software, in conjunction with mobile workforce tools (such as iPads), to develop a process where substation inspectors can perform inspections utilizing customized inspection lists. This allows inspections to be consistent and reduces the likelihood of missing important aspects of the inspection. The District’s 9 “non-SCADA” enabled substations are inspected bi-weekly (SCADA enabled substations are inspected monthly) utilizing iPads that allow for instant uploading of substation data. C&M staff also configured MinMax to display this substation inspection data in various formats for use in all Power Delivery Departments. The elimination of “paper” processes also included the importation of historical substation inspection data.

Results: The District now performs substation inspections more efficiently, consistently, and more comprehensively utilizing MinMax and mobile devices.
Results Driven Achievements from C&M for 2019

Issue: The District’s Supervisory Control and Data Acquisition (SCADA) system utilized an obsolete and unsupported UCA protocol.

Task: Upgrade the obsolete SCADA protocol to a more current and supported protocol.

Solution: Electronic Technicians have reconfigured 10 of the 23 Remote Terminal Units (RTU’s) so far from the obsolete UCA protocol to the popular DNP 3.0 protocol. This work also included updating the low-impact substations to conform to mandatory NERC Critical Infrastructure Protection (CIP) standards and functional test verification. This work also afforded the District to incorporate Multiple Change Detection (MCD) allowing the detection of fast state changes of substation and line devices. The inability to detect such changes was cause for operational challenges and safety concerns.

Results: This project is on-going, but has already resulted in complete compliance with NERC CIP Standards, increased SCADA reliability, and more efficient and safe operation of the District’s communication and electric systems.
Issue: From February 2019 to present, the District’s 20 Gigabit fiber system saw an increase in internet upstream traffic nearly double. The District’s fiber system was predicted to reach its full bandwidth.

Task: Upgrade the District’s fiber system to allow more bandwidth (internet usage) before maximum capacity is reached, resulting in slower data transmission for all fiber users.

Solution: Upgrading the District’s fiber backbone from 20 Gigabit to 100 Gigabit bandwidth will allow for more data transfer (internet traffic) and satisfy customer service requests for higher data transfer rates. The work to upgrade fiber bandwidth includes the replacement of approximately 200 fiber connectors. In preparation of this project, thousands of dollars worth of necessary test equipment was purchased to allow for testing and verification of 100 Gigabit fiber circuits. Electronic Technicians continue to be trained on this equipment to become more proficient. Upgrade and verification efforts are expected to be completed in 2020.

Results: This fiber upgrade allows more users and data traffic to utilize the District’s fiber system without impacting performance. Upgrading to a 100 Gigabit fiber system allows for the development of a redundant system that increases fiber system reliability and the ability for the District satisfying customer requests for a fiber service that includes increased data rates.
Results Driven Achievements from C&M for 2019

Issue: Workload of C&M Maintenance Engineering hinders abilities to address important issues.

Task: Allow the C&M Maintenance Engineer time to address some important issues

Solution: A new C&M Engineer was hired and is being brought up to speed. The existing C&M Engineer has been diligently addressing some important issues as time allows. Additional support will allow further availability to address issues.

Results: Since some C&M Engineer time has become available, numerous issues have been addressed that result in safer and more efficient work practices. These efforts have potentially avoided significant damage to equipment and potential harm to employees and the public. C&M Maintenance Engineer analytics have literally saved the District millions of dollars in the form of more efficient contracts (battery purchases, pole test and treat, tree trimming, tree removal, dock crews, equipment procurement, …). Additional savings were realized with the initiation of safer and more cost effective work practices and material (Belleville washers, high accuracy current transformers, polymer insulators, fiberglass cross arms, …).
The C & M staff would like to thank the Commissioners and Executive Staff for their continued support.
Vision & Mission – Enterprise Technology

**Vision:** To be invisible and indispensable in the delivery of GCPUD’s services to the people of Grant County.

**Mission:** To enable cost-efficient, error-free operation and timely decision making through technology that anticipates needs, silently solves everyday issues, and presents highly consumable, relevant information to stakeholders and users, regardless of where they are, when they need it, or how they wish to access it.
Significant Accomplishments since last update (August 2019)

• Successfully deployed Ultipro Human Capital Management System (HCMS) Phase 1 including migration of payroll processing by YE. This solution provides significant improvements in employee access to payroll data, HR business processes and related data via mobile application and web devices.

  Next steps – Complete automated integrations to key partners, timesheet improvements and other trailing cleanup work, then launch Phase 2.

• Deployed Office 365 enabling cloud hosted email services, enhanced records management, advanced eDiscovery tools, enterprise integrated Single Sign On (SSO) and advanced Team collaboration.

  Next steps – Migrate on premise SharePoint to cloud with re-branding, content clean-up and simplified workflows.
Significant Accomplishments since last update (August 2019)

• Completed CIP required Transient Cyber Asset Upgrades and Hardening by YE deadline, migrating from outdated Windows 7 devices to Windows 10 with full disk encryption.

  Next Steps – Complete Enterprise-wide migration of user computers to Windows 10 following our new enhanced hardening configuration to reduce cyber threats.

• Deployed ARCOS Mobile Workbench replacing legacy Trouble Reporting System and enabling basic but effective crew dispatch and work management through mobile devices / tablets.

  Next steps – Improve and expand automated data interfaces eliminating manual data entry of work orders from customer service.

• Deployed enterprise VPN access enabling secure remote working for all computer users.

• Upgraded and deployed new Akwire Maximo scheduling tool for Power Production.
# KPI Dashboard: 2019 Mid-Q3 Review

## Notes

- **Financial** – We under ran our capital budget significantly. See next slide.
- **Operational** – System stability, availability and performance remain high. Help Desk continues to receive great feedback.
- **Compliance** – Processes to access server rooms not followed in multiple cases requiring self-report.
- **Workforce** – We continue to emphasize cooperation between engineering and craft with improved clarity on roles and responsibilities.

## IT Performance Scorecard –2019 (Full Year)

<table>
<thead>
<tr>
<th>Key Result Area</th>
<th>KPI</th>
<th>KPI Measure</th>
<th>Quarterly Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Q1</td>
</tr>
<tr>
<td><strong>Financial</strong></td>
<td>F-1</td>
<td>O&amp;M Budget to Actuals</td>
<td><img src="green" alt="Green" /></td>
</tr>
<tr>
<td></td>
<td>F-2</td>
<td>Capital Budget to Actuals</td>
<td><img src="green" alt="Green" /></td>
</tr>
<tr>
<td></td>
<td>F-3</td>
<td>Labor Budget to Actuals</td>
<td><img src="green" alt="Green" /></td>
</tr>
<tr>
<td><strong>Operational</strong></td>
<td>O-1</td>
<td>Customer Satisfaction</td>
<td><img src="green" alt="Green" /></td>
</tr>
<tr>
<td></td>
<td>O-3</td>
<td>Help Desk First Contact Resolution</td>
<td><img src="green" alt="Green" /></td>
</tr>
<tr>
<td><strong>Compliance</strong></td>
<td>C-1</td>
<td>CIP Compliance</td>
<td><img src="yellow" alt="Yellow" /></td>
</tr>
<tr>
<td></td>
<td>C-2</td>
<td>Annual State Audit</td>
<td><img src="red" alt="Red" /></td>
</tr>
<tr>
<td></td>
<td>C-3</td>
<td>Annual Independent Audit</td>
<td><img src="red" alt="Red" /></td>
</tr>
<tr>
<td><strong>Workforce</strong></td>
<td>W-1</td>
<td>Labor Relations</td>
<td><img src="red" alt="Red" /></td>
</tr>
<tr>
<td></td>
<td>W-3</td>
<td>Safety Culture</td>
<td><img src="green" alt="Green" /></td>
</tr>
</tbody>
</table>

---

*Q3 is projected based on current status

---

*CIP, Annual State Audit, and Independent Audit indicators reflect last fully completed audits.*
# Financial Performance, FY 2019

## Key Capital Variance Items

<table>
<thead>
<tr>
<th>Description</th>
<th>2019 Budget</th>
<th>2019 Actual</th>
<th>% Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.13 Firewall Replacements</td>
<td>$2,653,132</td>
<td>$1,139,351</td>
<td>57.1%</td>
</tr>
<tr>
<td>10.10 Office 365 Migration</td>
<td>$362,400</td>
<td>$136,692</td>
<td>62.3%</td>
</tr>
<tr>
<td>10.15 Ubiquitous Business Wireless</td>
<td>$168,200</td>
<td>$136,605</td>
<td>18.8%</td>
</tr>
<tr>
<td>10.1 Data Management and Modeling</td>
<td>$1,280,100</td>
<td>$71,129</td>
<td>94.4%</td>
</tr>
<tr>
<td>10.12 SharePoint O365 Migration</td>
<td>$52,800</td>
<td>$51,728</td>
<td>2.0%</td>
</tr>
<tr>
<td>IT Project Pool, Small Projects</td>
<td>$200,000</td>
<td>$30,005</td>
<td>85.0%</td>
</tr>
<tr>
<td>10.14 Network Core Replacements</td>
<td>$1,704,600</td>
<td>-</td>
<td>100.0%</td>
</tr>
<tr>
<td>Copy Machine Replacements</td>
<td>$51,000</td>
<td>-</td>
<td>100.0%</td>
</tr>
<tr>
<td>SAN Components</td>
<td>$36,000</td>
<td>-</td>
<td>100.0%</td>
</tr>
<tr>
<td>Server Replacements</td>
<td>$200,000</td>
<td>-</td>
<td>100.0%</td>
</tr>
<tr>
<td>14-1 Develop a Reporting Strategy</td>
<td>$113,712</td>
<td>-</td>
<td>100.0%</td>
</tr>
<tr>
<td>10-4 Technology Work and Capacity Management</td>
<td>$466,080</td>
<td>-</td>
<td>100.0%</td>
</tr>
<tr>
<td>14-2 Develop an Enterprise Data Governance Strategy</td>
<td>$334,512</td>
<td>-</td>
<td>100.0%</td>
</tr>
<tr>
<td>10-7 Analytics Platform Evaluation</td>
<td>$266,400</td>
<td>-</td>
<td>100.0%</td>
</tr>
<tr>
<td>10-8 Develop a Technology Retirement Strategy</td>
<td>$259,600</td>
<td>-</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>$8,148,536</td>
<td>$1,565,510</td>
<td></td>
</tr>
</tbody>
</table>
Key Projects by Function

Customer
• Human Capital Management Solution (Phases 2 & 3)
• Implement a Time-Tracking Solution
• Upgrade CC&B

Operations
• Substation SCADA build-out
• Integrated Generation Control
• Energy Management System Replacement
• Trouble Reporting System Modernization
• ARCOS Crew Management
• ESRI ArcGIS for Power Delivery
• Mobile Workforce Management (Phase 2)

Finance
• Assetworks Fleet Management
  • Vehicle Telematics
• Physical Access Control
• Warehouse Barcoding and Inventory Control
• Core Financial System Replacement
• Standard Financial Reporting

Technology
• Firewall Modernization
• Network Modernization
• Office 365 Migration including SharePoint, OneDrive and Teams
• Establish an Enterprise Architecture Practice
• Enterprise Asset Management Strategy
• Enterprise Data Governance Strategy
Key Projects for 2020

• (On Track) Complete migration from on-premise Oracle Customer Care & Billing (CC&B) system to Oracle Customer Cloud Services (CCS) adding new Meter Data Management (MDM) capabilities.
  - Target completion by August 2020

• (On Track) Formally launch the project to replace legacy Electric design tools and GIS with ESRI based integrated tools from Schneider Electric and ESRI.
  - Target launch late Q1 or early Q2
    - Significant 2-year project will have transformational impacts on utility

• (On Track) Finish HCMS Roll-out (Phases 2-4) including Performance Management, Benefits Management, and Learning Management
  - Target completion Q3
Key Projects for 2020

• (In Planning) Enterprise Data Lake and reporting will provide KPI dashboards atop broad reporting and analytics capabilities. (Q3 targeted)

• (Behind) Complete Assetworks Fleet Management System Deployment (Q2 Targeted)

• (Behind) Complete Genetec Physical Access Control System Deployment (Q2 Targeted)
Significant Challenges

New: ePPM/PMO functional maturity

- Lack of working intake is causing technology demand to “stack and veer”
- Technology project status is not rolling up to portfolio view (fragmented)

Continuing: Acquisition and retention of Technology resources with the capabilities needed to execute the technology roadmap

- Turn-over is a “bar raising” activity, but can affect moral

Continuing: Sheer volume of projects underway while we are maturing virtually every function and delivering results at a historic pace

- Success breeds more success, but change stresses staff
Personnel Changes / Staffing

HR process throughput has greatly improved, enabling positions to be quickly approved and posted, giving us the best opportunity to fill openings.

**Telecom** –
*IT Operations Manager filled (external)*
*Telecom Engineer position filled (external)*

**Platform Ops** – *Evaluating additional need*

**Software Engineering & Architecture** -
*Supervisor candidate filled (external)*
*Senior SW Engineer resigned (position posted)*
*Manager returned to SW Engineer role*
*Manager role open (position posted)*
Powering our way of life.
Rate Schedule 17
2019 Update #2

Process Co-Leads:
Clark Kaml and Louis Szablya

Presented by:
Louis Szablya and Baxter Gillette, Large Power Solutions
February 11, 2020
# RS17 2019 Update - Project Charter

## Project Name:
Rate Schedule 17 – 2019 Annual Refresh

### Business Value Proposition – Problem to be Solved

- Rate Schedule 17 was developed to help Grant PUD deal with the risk associated with energy intensive industries that have the potential to impact the rates of Grant PUD’s existing core customers and other existing customers. Industry groups that consume and could consume (based on expectations) more than 5% of Grant PUD’s total load are to be considered in this group. Additional screens determine if the identified industry group meets certain criteria to be considered as an Evolving Industry.

## Business Strategy Reference (Select all that apply)

- Safety for both public and employees
- Maintain a strong financial position
- Provide long term low rates
- Operate responsibly by attaining environmental, cultural, resource and regulatory compliance

## Improvement Opportunity Summary

- Review Grant PUD’s service area and identify industries that are growing rapidly and exceed, or may in the nearby future, 5% of Grant PUD’s total energy load (Concentration). Include public input if possible.
- Update pricing model(s) used in 2018 with 2019 information to establish RS 17, determine if the trajectory or any underlying rate components need to be updated.

## Goals and Objectives (How much and by when)

- Study and assess the Concentration of industries identified with the potential to have enough aggregate kWh per year to represent 5% or more of Grant PUD total load.
- Review and update if necessary, the rates in the current RS 17 and provide recommendations.
- Seek public comment on appropriate elements of the RS 17 2019 Annual Refresh

## Dependencies

- Availability of system load data
- Accurate Identification of Evolving Industry accounts
- Billing information and data extraction from CC&B and SSN Operational Data

## Summary Measurable Benefits

- Grant PUD is required to update RS 17 each year using a team that can assess the potential impacts of various Evolving Industries.

## Project Contacts & Stakeholders

**Executive Sponsor:** Dave Churchman

**Project Leads:** Louis Szablya - Prime-LPS, Clark Kaml – Co-lead-Rates

**Responsible Mgr.:** Baxter Gillette

**Responsible Sr. Mgr.:** Louis Szablya

**Key Stakeholders or Team Members:**
- Devon Williams – Risk Management
- Terry McKenzie – Customer Solutions
- Mike Facey – Accounting
- Jesus Lopez - Engineering
- Bonnie Overfield – continuity

## Project Milestone Dates

- **Charter Adoption:** Sep 9
- **Assignments:** Sep 10
- **Kick-Off:** Sep 11
- **Public Input:** Sep [17]
- **Incorporate into rate process:** Oct 1

## In Scope

- Identify new potential Evolving Industries and assess Concentration
- Solicit public input regarding Concentrations and Assumptions
- Assess all industry groups whose collective energy loads exceed 5%
- Update RS 17 rate calculations including reviewing and vetting assumptions
- Recommend update to rates if needed

## Out of Scope

- Changing Rate 17 design
- Material changes to implementation of Rate Schedule 17 other than updating the billing components

## Project SharePoint Site:
Large Power Solutions>Site Contents>RS17 2019 Update

## Cost Estimate:
No Capital Required
# RS17 Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dave Churchman</td>
<td>Executive Sponsor**</td>
</tr>
<tr>
<td>Louis Szablya*/Clark Kaml</td>
<td>Co-Lead Large Power Solutions/Rates &amp; Pricing</td>
</tr>
<tr>
<td>Baxter Gillette</td>
<td>Update Manager**</td>
</tr>
<tr>
<td>Paul Dietz</td>
<td>Risk Management** and Subject Matter Expert</td>
</tr>
<tr>
<td>Terry McKenzie</td>
<td>Customer Service</td>
</tr>
<tr>
<td>Mike Facey</td>
<td>Accounting</td>
</tr>
<tr>
<td>Jesus Lopez</td>
<td>Engineering</td>
</tr>
<tr>
<td>Bonnie Overfield</td>
<td>Finance</td>
</tr>
</tbody>
</table>

* Prime
** Not required per the Rate Schedule
Industry or Use Assessment
Concentration Risk
Evolving Industry Assessment - Status

- Porters Five Forces analysis complete
- Updating detailed calculations to reflect final numbers from pricing update
Pricing Model Review
Rate Schedule 17 Billing Rates
## Input Refresh for Rate Schedule 17

<table>
<thead>
<tr>
<th>Complete By</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wed 1/29</td>
<td>Methodology reviewed and updated to reflect current information</td>
</tr>
<tr>
<td>Thu 1/30</td>
<td>Spreadsheets updated and vetted</td>
</tr>
<tr>
<td>Thu 1/30</td>
<td>Calculations being completed and verified</td>
</tr>
<tr>
<td>Thu 1/30</td>
<td>Quality check of data and spreadsheets</td>
</tr>
<tr>
<td>Fri 1/31</td>
<td>Final Committee Review next week</td>
</tr>
<tr>
<td>Tue 2/4</td>
<td>Post findings on Grant PUD website for public comment</td>
</tr>
<tr>
<td>Wed 2/5</td>
<td>Present findings to CXO Team</td>
</tr>
<tr>
<td>Mon 2/11</td>
<td>Consider public comment and complete presentation and documentation</td>
</tr>
<tr>
<td>Tue 2/12</td>
<td>Prepare final recommendation and Resolution</td>
</tr>
<tr>
<td>Wed 2/13</td>
<td>Submit for inclusion in commission packet</td>
</tr>
<tr>
<td>Tue 2/25</td>
<td>Present recommendation to commission</td>
</tr>
</tbody>
</table>
2020 Federal & State Legislative Update

February 11, 2020 Commission Presentation

External Affairs & Communications
Andrew Munro, Senior Manager
Cliff Sears, Senior Policy Analyst
This update will cover

- Broadband Funding Update
  - Federal & State
- WA Legislative Schedule
- Hydro Tax Parity
- WA Legislative Session Bills
- Review Carbon Principles & CETA
- CETA Rulemaking Priorities
Rural Broadband Funding -

Grants & Budget Efforts:

- **USDA Rural Utility Service (RUS)** $15-20M
  - Speeds 10 x 1 mbps or less
  - 6 week application window; 9 mo. wait time.
  - High risk of strings attached to federal grant programs that we can’t work around.
  - Shift to state grant programs

- **WA State Grant Program**
  - Speeds $\geq 10 \times 1$ mbps, but $\leq 25 \times 3$ mbps
  - $1-2$M maximum.
  - Working with Public Works Board on rulemaking.

- **WA Supplemental Budget Reallocation**
  - Current $23$M ($25\%$ grants / $75\%$ loans)
  - Flip to $75\%$ grants / $25\%$ loans $+$ $10$M
  - Challenges: Budget shortfall; PWB perspective.

- **New WA Broadband Dir.: Russ Elliott**
  - Precision Ag tour in Quincy a huge success.

- **Repurpose previously appropriated $ to WA**
  - Align federal programs w/ WA programs
  - e.g. FCC - Rural Digital Opportunity Funds (RDOF) so WA utilities can participate
2020 WA Legislative Session

Schedule: January 13 – March 11, 2020 (60 days)

Key Cutoff Dates:

- **FEB 7**: Last day to be out of the policy committee in the house of origin
- **FEB 11**: Last day to be out of the fiscal committee in the house of origin
- **FEB 19**: Last day for bills to be out of the house of origin
- **FEB 28**: Last day for bills in opposite house to be out of policy committee
- **MAR 2**: Last day for bills in opposite house to be out of fiscal committee
- **MAR 6**: Last day to consider opposite house bills
- **MAR 11**: End of regular session
Win or Lose, Hydro Tax Parity is a good bill to talk about Hydro

- On the senate floor, with a floor striker that includes tax breaks for existing hydro contracts
  - Goal: Get it out of the Senate and then be open to some changes in the House.
- Coordinated utility efforts ongoing.
- Message points:
  - Tax fairness
  - Jobs
  - Hydro is key for implementation of CETA
Bills we support:

- SB 6479 / HB 2458 – Protects PUD VEBA accounts from higher administrative charges.
- **Budget/funding increases** – For fiber and WA Broadband Office.

Bills with concerns:

- HB 2311 / SB 6272 – Modifies GHG limits:
  - 2030 = 45% below 1990
  - 2040 = 70% below 1990
  - 2050 = 95% below 1990 (50% below 1990 is current goal)
- HB 2414 – **Digital equity** bill.
- **HB 2362** – 2% tax on electric business within cities to fund local transportation projects. (I-976 fixes likely deferred).
- HB 2331 / SB 6272 - Mandates **posting agendas and notices** of special meetings 72 hours in advance under the OPMA.
- SB 6260 - New or amended **water rights** require finding of no adverse effect on tribal historical or cultural interests.
- HB 2472 - **GHG emissions** from fossil fuels (global warming potential) to be used in SEPA environmental reviews.
Bills we support:

- **SB 6135** – Accelerates **reliability study** by Commerce (Jan. 1, 2022).
  - Commerce to make recommendations to legislature if CETA goals can’t be met without violating reliability
- **SB 6012** – **Hydro Tax Parity**
- **HB 2285** – **Tax incentive** for Oil-free turbine technology
- **HB 2694 / SB 6420** – Creates **safety committee** for protection of underground utilities.

Bills with concerns:

- **HB 1110/ SB 5412** - **Low carbon Fuel Standards**
- **SB 5981** - **Cap and Trade** Legislation
  - It is unclear if bill will be considered this session.
- **HB 2248 / SB 6223** - Comm. **solar tax breaks** & net metering
- **SB 6380** - Study **removal of Ballard locks & Skagit River dams**
- **HB 2586** - **Incentives to switch customers to electricity** in light of WA constitutional prohibition in Art. VIII, Sec. 10.
- **Clean Air Rule Fix** - On 1/16/2020, the WA Supreme Court held Ecology had authority under the WA law to **regulate direct emissions**, but not indirect emissions (e.g. fuel distribution companies). May impact local companies that emit GHGs. Legislation may be proposed to provide regulatory authority over indirect emissions.
Carbon Principles Review

- **Least Cost**: Achieve carbon goals at the least cost to electric customers.
- **Performance Based**: Utilities have flexibility of tools to achieve carbon goals & maintain electric reliability.
- **Technology Neutral**: That hydro generation is treated the same as other carbon-free resources through eligibility & tax parity.
- **Cost Cap**: Cost protections to electric consumers.
- **Reliability**: System reliability is maintained.
- **I-937 Harmonization**: There is harmonization between requirements under I-937 and this bill by not requiring utilities to acquire more than 100% carbon-free resources.
Clean Energy Transformation Act (CETA)

Passsed 2019 WA Legislative Session

CETA Overview (SB 5116):

- **2025**: No coal-fired resource costs can be allocated in rates – Unspecified purchases are exempt from this requirement.
- **2030 – 2033** (and each 4-year period thereafter): 100% carbon neutral standard for service to retail electric load
  - 80% delivered carbon-free power (includes hydro & non-carbon emitting generation).
  - 20% alternative compliance through either:
    - $60/MWh fee (for CCNG unit)
    - Investment in energy transformation activities
    - Renewable Energy Credits (RECs)
  - Hydropower creates bankable unbundled RECs; nuclear does not.
  - **Cost Cap**: Incremental cost of compliance, including I-937 costs, ≥ 2% over a 4-year compliance period of a utility’s retail electric revenue requirement.
- **2045**: 100% absolute zero carbon standard, but no penalty.
CETA Implementation Priorities:

- Demonstration of 4-year Compliance Period –
  - Banking RECs v. averaging (4-year) to meet clean standards.
- Treatment of unspecified power.
- Ensuring all customers benefit from the transition to clean energy (equity requirements).
  - Defining low income, energy burden and energy assistance need & types of households
- Commerce Authority over integrated resource plans and 10-year clean energy action plans.
- Energy Transformation Projects – GHG emission calculation by WDOE
Powering our way of life.
GCPD SUBSTATION TRANSFORMER ASSESSMENT

Date: October 29, 2019
William L. Coe

Public Utility District No. 2 of Grant County, WA

2019 SUBSTATION TRANSFORMER ASSESSMENT
PURPOSE OF THE ASSESSMENT
The District has two “standard” sizes of substation transformers:

- 25 MVA (~25 MW’s) primarily used in residential and rural locations
- 41 MVA (~41 MW’s) primarily used to serve industrial locations

The District currently possesses two mobile substations:

- 18 MVA transformer that can only connect to the 115kV transmission system
- 24 MVA transformer that can connect to either 115kV or 230kV transmission system

Note that if a 41 MVA transformer is loaded beyond 24 MVA, mobile substations are not a suitable replacement.
Per ANSI C57.96, transformers are designed for a normal life expectancy of _____?

180,000 hours (~20 years)
The average age, based on year of manufacture, of the District’s transformers is 24.2 years. Of the 87 District transformers, 28 are older than 30 years, 4 are over 60 years, with the oldest at 69 years of age.
CAUSES OF TRANSFORMER FAILURE

Fig. 1: Causes of Transformer Failure

- Lightning: 22%
- Through Faults: 13%
- Insulation Deterioration: 12%
- Inadequate Maintenance: 11%
- Moisture: 6%
- Loose Connections: 6%
- Workmanship: 5%
- Overloading: 4%
- All Others: 3%

Location of Transformer Failure

- Main Tank 30%
- OLTC 35%
- Bushing 15%
- Cooling System 5%
- Others 15%

Source of data: The Hartford Steam Boiler Inspection and Insurance Co.
Dissolved Gas Analysis (DGA)

### ASTM D3812C Dissolved Gas Analysis (Expressed in ppm's)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetylene (C2H2)</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Hydrogen (H2)</td>
<td>&lt;10</td>
<td>&lt;10</td>
<td>&lt;10</td>
<td>&lt;10</td>
<td>&lt;10</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Ethylene (C2H4)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Methane (CH4)</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Ethane (C2H6)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Carbon Dioxide (CO2)</td>
<td>469</td>
<td>318</td>
<td>659</td>
<td>371</td>
<td>371</td>
<td>371</td>
</tr>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>&lt;10</td>
<td>&lt;10</td>
<td>&lt;10</td>
<td>&lt;10</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Oxygen (O2)</td>
<td>812</td>
<td>1733</td>
<td>202</td>
<td>411</td>
<td>130</td>
<td>617</td>
</tr>
<tr>
<td>Nitrogen (N2)</td>
<td>48539</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Combustible Gas (%)</td>
<td>6</td>
<td>23</td>
<td>13</td>
<td>15</td>
<td>39</td>
<td>25</td>
</tr>
<tr>
<td>% Combustible Gas</td>
<td>0.01</td>
<td>0.05</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>% Total Dissolved Gas (%)</td>
<td>4.09</td>
<td>4.62</td>
<td>5.06</td>
<td>4.92</td>
<td>11.05</td>
<td>0.15</td>
</tr>
<tr>
<td>CO2/CO Ratio Code (rv)</td>
<td>0.00</td>
<td>16.95</td>
<td>10.29</td>
<td>44.96</td>
<td>20.26</td>
<td>22.53</td>
</tr>
<tr>
<td>Oil Temp (°C)</td>
<td>47</td>
<td>30</td>
<td>46</td>
<td>33</td>
<td>30</td>
<td>55</td>
</tr>
</tbody>
</table>

**Gas Ratios:**
- Ratio 1 = CH4 / H2
- Ratio 2 = C2H4 / C2H2
- Ratio 3 = C2H6 / CH4
- Ratio 4 = C2H6 / C2H4
- Ratio 5 = C2H4 / C2H2

**Comments:** Meets condition 1 in IEEE Std. C57.134-2008.

---

### ASTM D-5837 Furans in Oil Analysis

<table>
<thead>
<tr>
<th>Collection Date:</th>
<th>8/8/2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furanic Compound</td>
<td>&lt;10</td>
</tr>
<tr>
<td>5-hydroxymethyl-2-furaldehyde (SH2F)</td>
<td>&lt;10</td>
</tr>
<tr>
<td>furfuryl alcohol (FF)</td>
<td>&lt;10</td>
</tr>
<tr>
<td>2-furaldehyde (2FA)</td>
<td>&lt;10</td>
</tr>
<tr>
<td>2-acetylfuran (2AF)</td>
<td>&lt;10</td>
</tr>
<tr>
<td>5-methyl-2-furaldehyde (5M2F)</td>
<td>&lt;10</td>
</tr>
</tbody>
</table>

**Estimated DP:** >1000

---

### Oil Quality

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>D-877 Dielectric (kV)</td>
<td>59.4</td>
<td>64.2</td>
<td>52.6</td>
<td>48.3</td>
<td>67.9</td>
<td>48.4</td>
</tr>
<tr>
<td>D-1816 Dielectric (kV mm-C)</td>
<td>59.4</td>
<td>64.2</td>
<td>52.6</td>
<td>48.3</td>
<td>67.9</td>
<td>48.4</td>
</tr>
<tr>
<td>D-1816 Dielectric (kV mm-C)</td>
<td>59.4</td>
<td>64.2</td>
<td>52.6</td>
<td>48.3</td>
<td>67.9</td>
<td>48.4</td>
</tr>
<tr>
<td>D-1533 Moisture (ppm)</td>
<td>5.7</td>
<td>2.8</td>
<td>3.4</td>
<td>8.5</td>
<td>21.6</td>
<td>63.0</td>
</tr>
<tr>
<td>D-974 Acid Neutralization (mg KOPh)</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>D-974 Acid Neutralization (mg KOPh)</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>D-1500 Color</td>
<td>&lt;2.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-1524 Visual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-1298 Specific Gravity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-924 Pwr Factor (25°C) (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-824 Pwr Factor (100°C) (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-1698 Sediment (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-1275B Corrosive Sulfur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPA 8082 PCB by Method 8082 (ppm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Relative Saturation (%):**
- 3.7% (1979)
- 3.4% (1980)
- 2.3% (1981)
- 9.1% (1982)
- 9.1% (1983)
- 26.1% (1984)
- 30.7% (1985)

**Comments:** Meets IEEE Std. C57.108-2015 acceptable levels.
9 of the District’s 87 substation transformers are indicating less than new condition but in “good condition.” Of these 9 transformers, 2 are in “midlife” state.
This assessment has identified numerous transformer/substation issues that should be noted.

- Expectations regarding service interruptions as a result of a transformer failure need to be realistic.
  Recommendation: In the event of a substation transformer failure, it should be expected that the resulting interruption of service could be between hours and over a week in duration. The longer duration outages are more likely to be experienced by large manufacturing facilities, including data centers. This should be communicated to customers.

- Adequate spare transformers always need to be stocked.
  Recommendation: In accordance with the District’s Power Delivery planning guidelines, reliable spare substation transformers should be stocked and readily available for deployment. The variety of spare transformers stocked should have the necessary characteristics to be a replacement for any of the current transformers in the District’s system.

- Not all the District’s substations can accommodate mobile substations.
  Recommendation: All substations with access issues should be identified and access alternatives should be investigated. Roadway reconfigurations adjacent to substations should be monitored to ensure adequate access is maintained between public roadways and the District’s substation properties. The District design standard for the past 10+ years is to design substations to accommodate the use of a mobile substation.

- The District’s existing mobile substations are inadequately sized to be a viable “backup” to many of the District’s transformers.
  Recommendation: The District should consider the purchase of a 50 MVA mobile substation. Technical aspects of a 50 MVA mobile substation allow it to be most closely aligned to our standard 41 MVA substation transformers. The construction of a mobile substation of this size requires at least a 12-month lead time. This mobile substation weighs about 190,000 pounds and will likely require the District to purchase a tractor to readily transport the unit. Estimated cost for the mobile substation and a suitable tractor is about $4.5M. Umatilla Electric recently purchased a similar unit.

- Mitigation plans should be developed to most efficiently restore service if a substation transformer fails.
  Recommendation: This assessment should be shared with all vested stakeholders. The dynamic growth of the District’s system warrants this assessment to be updated annually to accurately reflect potential issues.
Questions