

AGENDA
BOARD OF TRUSTEES
PORTLAND WATER DISTRICT

225 Douglass Street, Portland, Maine

Jeff P. Nixon Training Center

6:00 p.m. on Monday, October 23, 2023

Remote Meeting Participation Available to the Public via Zoom at:

https://us06web.zoom.us/j/81514135336?pwd=LPr_OmT0l23ctZcbgCmd-WBOzX4NA.-QyZPJ0V51_O8fGB

1. Convene Meeting with Pledge of Allegiance and moment of silence President Lunt
2. Roll Call Clerk
- 3a. Acceptance of Minutes of the Regular Meeting of September 18, 2023 President Lunt
- 3b. Acceptance of Minutes of the Workshop Meeting of October 10, 2023 President Lunt
4. Invitation for Public Comment President Lunt
5. Reports:
 - Operations Committee Report Trustee McCann
 - Planning Committee Report Trustee Douglas
 - Administration & Finance Committee Report Trustee Cote
 - General Manager's Report General Manager
6. Overview and presentation regarding the Draft 2024 Budget General Manager
7. New Business:
 - A. **Order 23-034** authorizing actions related to the Water Main Business Risk Exposure Analysis (WMBRE Analysis) Project as a subcomponent of the Comprehensive Infrastructure Asset Management Plan (CIAMP) Project Operations Committee
 - B. **Order 23-035** authorizing actions related to the East End Secondary Clarifiers and Primary Gallery Upgrade Project Operations Committee
 - C. **Order 23-036** authorizing acceptance of \$700,000 from the Maine Drinking Water Programs SRF Lead Copper Compliance Funds Planning Committee
 - D. **Resolution 23-013** declaring the Board's intent to reimburse costs paid by the District from the Water Fund with the proceeds of a future tax-exempt bond Admin. & Finance Committee
 - E. **Order 23-037** authorizing a contract with E-Source for the purchase of computer system testing software and related implementation services Admin. & Finance Committee
8. Other Business An item may be added to this agenda provided seven trustees vote to waive the rule regarding agendas. President Lunt

9. Second Invitation for Public Comment President Lunt
10. Trustee Comments President Lunt
11. Executive Session A motion may be made to go into Executive Session at any time during the meeting to discuss, pursuant to 1 M.R.S. §405(6)(A) personnel, 1 M.R.S. §405(6)(C) real estate, 1 M.R.S. §405 (6)(D) labor negotiations, or 1 M.R.S. §405(6)(E) legal matters. President Lunt
12. Adjournment President Lunt

Donna M. Katsiaficas
Clerk

Portland Water District
Board of Trustees Regular Meeting

October 23, 2023

New Business

Agenda Item 7A – 7E



Portland Water District
From Sebago Lake To Casco Bay

BOARD OF TRUSTEES / AGENDA ITEM SUMMARY

Agenda Item: 7A Order 23-034
Date of Meeting: October 23, 2023
Subject: Comprehensive Infrastructure Asset Management Plan: Professional Services Contract – Selection and Engineering Method Approval
Presented By: Gordon Johnson, Engineering Services Manager

RECOMMENDATION

The following proposed language is presented for Board of Trustee approval:

ORDERED, the General Manager is authorized to execute a professional services contract with infraPLAN LLC in the amount of \$254,145.00 for engineering services for a Water Main Business Risk Exposure Analysis (WMBRE Analysis) project as a subcomponent of the Comprehensive Infrastructure Asset Management Plan (CIAMP) project (CIP 2023-3/3071); and that the General Manager and the Treasurer, each acting singly, are authorized to take such steps as may be necessary to accomplish the intent of the vote; and

BE IT FURTHERED ORDERED, that the Phased Method is hereby authorized for the procurement of engineering services for the Comprehensive Infrastructure Asset Management Plan (CIAMP) Project, pursuant to the District’s Purchasing Policy; and

BE IT FURTHER ORDERED, that a total subcomponent WMBRE Analysis project budget is hereby authorized, not to exceed \$285,000; and that the General Manager, and the Treasurer, each acting singly, are authorized to take such steps as may be necessary to accomplish the intent of the vote.

BACKGROUND ANALYSIS

In 2003, PWD completed the Comprehensive Water System Strategic Plan (CWSSP), which provided a framework for the future operation of the PWD water system. Twenty years have passed since the plan was developed and, in that time, water main likelihood of failure (LOF) analysis tools have adopted statistical modeling and artificial intelligence-based approaches to help predict water main failures and summarize conditions. PWD has a corporate reliability goal of less than 10 leaks per 100 miles of water main. In recent years, PWD has met this goal; however, it is anticipated that the level of investment will hit an inflection point at some point in the relatively near future and require significantly higher levels of resources to meet this goal. The water main model will consider both the likelihood and consequence of failure (COF) to provide risk-based predictions for the PWD water system piping network that can be utilized for annual and multi-year water main capital planning and budgeting that meet stakeholder level of service expectations.

Staff reviewed and scored four qualification packages from engineering teams and vendors that provided proposed methods for achieving the project goals. Based on the outcome of the review and ranking, infraPLAN partnered with Burgess & Niple, received the best overall score (134). Staff therefore recommends an award to infraPLAN for an amount of \$254,145, with a project contingency of \$30,855, and a total project budget not to exceed \$285,000.

This project includes the following engineering services: (1) Data collection, review, and cleaning, (2) Likelihood and consequence of failure predictions for each pipe, and (3) Detailed replacement and rehabilitation plans guided by level of service objectives and budget constraints.

As approved by Board Order 22-003 on January 24, 2022, the comprehensive method for procuring engineering services was planned for this project, meaning that it was anticipated that the same firm would be utilized for the complete plan development as well as follow-up process refinement and system optimization efforts. The project approach has changed due to refinements in the project approach. Staff is recommending a revision to the engineering method for procuring engineering services from a comprehensive to a phased method. If approved by the Board, the intent of this Order is to procure professional services from firms that are uniquely qualified to complete the individual subcomponent project scope(s).

Project #: 2023-Subprogram 3/ Project 3071

FISCAL REVIEW/FUNDING

The project was included in the 2023 CIP, Subprogram 3, Project 3071. The Board authorized the creation of a reserve to fund the project on January 27, 2020 (order 20-002). The reserve fund contains \$944,548 and is sufficient to fund the project. The 2023 CIAMP budget is \$800,000, the proposed 2024 CIAMP budget is \$400,000, and the project has been awarded a \$375,000 grant from the Drinking Water State Revolving Fund (DWSRF) program. The project costs will be withdrawn from the reserve fund and not have an impact on the operating budget.

The project is creating a model that may need to be updated on an ongoing basis. Updating the model, receiving software training, and/or maintaining a software subscription costs in the range of \$32,000 - \$85,000 and would be added to the AMAP operating budget in future years.

LEGAL REVIEW

Corporate Counsel has reviewed the proposed order as to form.

CONCLUSION(S)

Staff recommends awarding the contract for engineering services for the Water Main Business Risk Exposure Analysis (WM BRE Analysis) project as a subcomponent of the CIAMP project to infraPLAN LLC and Burgess & Niple.

Staff recommends that the phased engineering method be utilized to design and implement this project. The Committee unanimously voted to forward the item to the full Board for their consideration.

ATTACHMENT(S)

SUPPORTING INFORMATION

SUPPORTING INFORMATION

This project is undertaking the next phase of strategic water main asset management and planning to improve upon PWD's current water main replacement and rehabilitation planning methods. A key outcome of this effort is the likelihood of failure, consequence of failure, and business risk data for each water main that can be used to prioritize recommendations and plan capital improvement projects.

Current water main capital improvement activities are determined largely by partnerships with municipal and state (Maine DOT) entities who are replacing parallel infrastructure to realize project execution and financial efficiencies. This strategy does take into consideration pipe condition to the extent that it can be estimated based on failure (break) history. There have been advancements in statistical analysis and artificial intelligence (AI) that improve capital outlay effectiveness.

This project includes the following engineering services, (1) data collection, data review, data cleaning, and data statistics (2) water main likelihood of failure scores (3) water main consequence of failure scores (4) water main business risk exposure scores (5) water main replacement and rehabilitation recommendation prioritization and project planning. This effort will include establishing a series of memos outlining the components of the analysis, development of a final report with the recommended water main CIP and future project costs, and a software tool that will allow for modifications to update the water main recommendations. The scope of the next CIAMP phase engineering services will be refined based on work sequencing and other project requirements.

Six qualified engineering firms or software vendors were invited to respond to the RFQ: Baseform, Ferguson and voda.ai, Fracta, Infrastructure Data Solutions (IDS), infraPLAN, and Rezatec. Four qualifications packages were received, including a combined team effort from infraPLAN and Burgess & Niple. A selection team of five PWD staff including representation from Water Operations and AMaP was assembled to review each firm's proposal.

Selection team members reviewed proposals independently and several review meetings were held. Each selection team member ranked the proposals based on the four non-fee categories identified in the RFQ; Technical Quality and Clarity (50%), Qualifications & Experience (30%), Project Approach (10%), and References (10%). Each proposal was ranked for each category using a 1-4 scale where a #1 ranking represented the proposal that best met the requirements. The rankings for each firm were averaged for the entire review team. A total of 100 represents a perfect score.

The firms developed proposals that highlighted their software model and proposed methods of addressing the challenges anticipated to achieve success. Based on the outcome of the review and ranking, the infraPLAN/B&N team received the best overall score (134).

Key factors that led to the recommendation of the infraPLAN/Burgess & Niple team include the following:

- A detailed and customized technical response that directly addressed each PWD objective;
- A highly qualified technical project team that focused on engineering solutions and guiding PWD staff through the process so the results can be effectively used to manage ratepayer funds and water main assets;

- Demonstrated grasp of the key drivers for project success being a risk-based decision-making tool that incorporates advanced data analytics, with considerations for configuring this tool to support future or changing goals;

The following table summarizes the results of the selection committee’s evaluation of each respondent, including a scoring breakdown:

Criteria	infraPLAN & B&N	Baseform	Fracta	Ferguson & voda.ai
1. Technical Quality and Clarity				
Weight - 50% (Best Score = 50)				
Methods Score	60	100	160	180
2. Qualifications & Experience				
Weight - 30% (Best Score = 30)				
Qualifications Score	48	42	90	120
3. Project Approach				
Weight - 10% (Best Score = 10)				
Approach Score	10	22	34	34
4. References				
Weight - 10% (Best Score = 10)				
References Score	16	14	36	34
Total Score	134	178	320	368
Rank	1	2	3	4

InfraPLAN and B&N identified three proposed scope items that are considered additional services beyond the minimum requirements established in the RFQ. Consequence of failure modeling of the water mains (\$34,000), project prioritization strategy, and scoring that incorporates non-risk R&R factors (\$2,600) and pipe re-grouping algorithm (\$2,470). The additional scope items were recommended to capitalize on an economy of scale that can be achieved by conducting both the LOF and COF analysis at the same time, as there is an overlap in the engineering skills and data needed to complete each analysis. Additionally, the completion of both LOF and COF analysis results in the most comprehensive risk score for each pipe.

Staff recommends award to infraPLAN for an amount of \$254,145 for completion of the Water Main Business Risk Exposure Analysis based on the ranking shown above, including the additional services identified. Once the design has been completed, a recommendation will be made to amend the contract to include construction phase services.

As approved by Board Order 22-003 on January 24, 2022, the comprehensive method for procuring engineering services was planned for this project, meaning that it was anticipated that the same firm would be utilized for the complete plan development as well as follow-up process refinement and

system optimization efforts. The project approach has changed due to internal PWD resource limitations. A phased method for procuring engineering services is now anticipated to be the best project approach and staff is recommending a revision to the engineering method for procuring engineering services from a comprehensive to a phased method, meaning it is anticipated that the different firms will be utilized for different phases and scopes of the project.



Portland Water District
From Sebago Lake To Casco Bay

BOARD OF TRUSTEES / AGENDA ITEM SUMMARY

Agenda Item: 7B Order 23-035
Date of Meeting: October 23, 2023
Subject: East End Secondary Clarifiers and Primary Gallery Upgrade Project – Construction Services
Presented By: Joel Jones, Project Engineer

RECOMMENDATION

The following proposed language is presented for Board of Trustee approval:

ORDERED, the General Manager is hereby authorized to execute a professional services contract amendment with Kleinfelder, in the amount of \$951,000 for construction services for the East End Secondary Clarifiers and Primary Gallery Upgrade Project (CIP 2021-21/3152 & CIP 2022-21/3147); and

BE IT FURTHER ORDERED, a professional services contract amendment with Woodard & Curran is hereby authorized, in the amount of \$100,000 for project management for construction services for the Project; and that the General Manager, and the Treasurer, each acting singly, are authorized to take such steps as may be necessary to accomplish the intent of the vote.

BE IT FURTHER ORDERED, a construction contract with Penta Corporation is hereby authorized, in the amount of \$5,045,100 for the Project; and that the General Manager, and the Treasurer, each acting singly, are authorized to take such steps as may be necessary to accomplish the intent of the vote.

BE IT FURTHER ORDERED, that a total project budget is hereby authorized, not to exceed \$10,375,000; and that the General Manager, and the Treasurer, each acting singly, are authorized to take such steps as may be necessary to accomplish the intent of the vote.

BACKGROUND ANALYSIS

The three existing secondary clarifiers at the East End Wastewater Treatment Facility are beyond their useful life and have experienced several failures. PWD hired Kleinfelder to provide design phase engineering services and Woodard & Curran to provide Owners Project Manager (OPM) Services earlier in 2023. Kleinfelder provided design phase engineering services for the Primary Gallery Upgrade Project in 2021 and 2022; therefore, the decision was made to combine the Secondary Clarifier Upgrade Project with the Primary Gallery Upgrade Project for a combined construction project.

The Project was publicly bid on August 31, 2023. Bids were received from two general contractors on September 26, 2023: Penta Corporation and T. Buck Construction. Both of the bids were under budget and were within 0.4% of each other. The bid tabulation for the project is shown in Attachment A.

Kleinfelder performed a due diligence review of the response and has determined that the apparent low bidder has the contracting capacity, relevant project experience, qualifications, and resources to complete the Project. PWD therefore recommends that Penta Corporation be considered the low-responsive and responsible bidder and recommends awarding the contract for \$5,045,100.

Pursuant to the Comprehensive Method (approved December 2018), PWD staff recommends a professional services contract amendment with Kleinfelder for engineering services during construction. PWD staff also recommends a professional services contract amendment with Woodard & Curran for project management for engineering services during construction.

Please refer to Attachment A for a summary of contractor bids and a breakdown of the proposed project budget.

FISCAL REVIEW/FUNDING

The Primary Gallery Upgrade Project was awarded \$3,950,000 in Clean Water State Revolving Loan Fund (CWSRF) and will receive a subsidized interest rate of 2% below the market rate. However, the Secondary Clarifier Replacement Project did not receive any CWSRF funding and will be funded by a bond issued with a market-based interest rate. The Project is anticipated to have an estimated operating fund impact of \$870,000 for Portland. The 2024 multi-year financial plan to be provided to the City of Portland later this year will include the project costs.

LEGAL REVIEW

Corporate Counsel has reviewed the proposed order as to form.

CONCLUSION(S)

Staff recommends awarding the contract to the lowest responsive and responsible bidder for the project, Penta Corporation, amendment of the professional services contract with Kleinfelder to reflect the provision of construction services and amendment of the professional services contract with Woodard & Curran to reflect the provision of project management for construction services for the Secondary Clarifier and Primary Gallery Upgrade Project. The Committee unanimously voted to forward the item to the full Board for their consideration.

ATTACHMENT(S)

Attachment A

ATTACHMENT A

Bid Summary:

Contractor	Item #1 Lump Sum Primary Gallery Upgrades	Item #2 Secondary Clarifier Equipment Replacement	Item #3 Total of All Unit Price Bid Items	TOTAL BID
T. Buck Construction Inc	\$3,315,136	\$1,600,000	\$150,790	\$5,065,926
Penta Corporation	\$3,020,000	\$1,900,000	\$125,100	\$5,045,100

Proposed Budget:

Item	Amount	Board Approval
Detailed Design and Bidding	\$1,062,217	CIP 2021 – 21/3152; September 2021 CIP 2023 – 21/3147; February 2023
Construction Phase Engineering Services	\$1,051,000	CIP 2022 – 21/3152 CIP 2023 – 21/3147 October 2023 (Proposed)
Pre-Procurement and Pre-Construction	\$2,659,588	
Construction	\$5,045,100	
Project Contingency	\$557,095	
Project Total	\$ 10,375,000	

Project #: CIP 2021 – Subprogram 21, #3152
CIP 2023 – Subprogram 21, #3147



Portland Water District
From Sebago Lake To Casco Bay

BOARD OF TRUSTEES / AGENDA ITEM SUMMARY

Agenda Item: 7C Order 23-036
Date of Meeting: October 23, 2023
Subject: Purchase of Vacuum Excavator
Presented By: Josh Hudak, Facilities Manager

RECOMMENDATION

The following proposed language is presented for Board of Trustee approval:

ORDERED, that the sum of \$700,000 is hereby accepted from the Maine Drinking Water Programs SRF Lead Copper Compliance funds, comprised of \$385,000 in principle forgiveness (grant) and a \$315,000 no interest loan; and

BE IT FURTHER ORDERED, that the General Manager is authorized to execute a contract with JESCO Inc. for the sum of \$685,000 for the purchase of a vacuum excavator; and

BE IT FURTHER ORDERED, that the 2023 Capital Improvement Plan Project 326/3041 is hereby amended and increased by the sum of \$700,000; and the General Manager and Treasurer are authorized each acting singly to take whatever actions necessary to accomplish the intent of this vote.

BACKGROUND ANALYSIS

The District applied in March 2023 for \$9M for the Maine Drinking Water Program's State Revolving Loan Lead Copper Loan fund for mitigating lead from the water distribution system. There were three projects that the District applied for and were tentatively approved in August. The three projects are service line inventory \$1M, the replacement of galvanized pipe \$7.2M, and the purchase of vacuum excavation equipment estimated at \$800,000. These projects are designated as 55% Principal Forgiveness at 0 % interest loans for a maximum of 20 years

The District was approved by the Drinking Water Program to put out a Request for Bids (RFB) to purchase a new Hydro Vacuum Excavator to self-perform vacuum excavations for developing a service line material inventory required by the revised Lead & Copper Rule. The RFB was sent to 4 vendors on September 21st with bids due on October 16th. (See Bid Tab)

Staff recommends awarding the Hydro Vacuum Excavator bid to the low bidder meeting the specifications to JESCO Inc.

FISCAL REVIEW / FUNDING

The Hydro Vacuum Excavator purchase will receive \$700,000 in Lead Copper funding from the Maine Drinking Water Program SRF Lead Copper Compliance Fund: \$385,000 in principle forgiveness and a \$315,000 no interest loan. The expected debt service payment for 10 years is \$31,500 per year.

LEGAL REVIEW

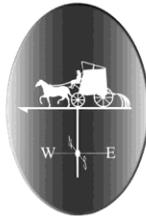
Corporate Counsel has reviewed the proposed Motion and has approved as to form.

CONCLUSION(S)

Staff recommends approval of the acceptance of the SRF loan and principal forgiveness and awarding to the low bidder meeting specifications. The Committee voted to send this to the full Board for their consideration.

ATTACHMENT(S)

<i>Vac Truck Vendor List</i>		
<u>Vendor</u>	<u>Dealer Name</u>	<u>Bid</u>
Ditch Witch	JESCO Inc.	\$685,000
Vac-Con	Sanitary Equipment	\$692,000
TRU VAC	CN Wood	Did not meet spec
Vermeer	Vermeer	Did not bid



Portland Water District
From Sebago Lake To Casco Bay

BOARD OF TRUSTEES / AGENDA ITEM SUMMARY

Agenda Item: 7D Resolution 23-013
Date of Meeting: October 23, 2023
Subject: Water Fund - Intent to Borrow
Presented By: David Kane, Director of Administrative Services

RECOMMENDATION

The following proposed language is presented for Board of Trustee approval:

RESOLVED, the Board hereby declares its intent to reimburse costs paid by the District from the Water fund with the proceeds of a future tax-exempt bond. The full form of the resolution is attached hereto and incorporated herein by reference, and shall be part of the minutes of this meeting.

BACKGROUND

The Operation Committee considered at their October 10, 2023 meeting, a motion authorizing the purchase of a Hydro Vacuum Excavator for up to \$700,000. Financing has tentatively been approved by the Maine Drinking Water Program to come from their Lead Copper Loan fund for assessing water lines for lead and mitigating lead from water distribution systems. The loan would be tax-exempt and designated as 55% Principal Forgiveness at 0% interest loans for a maximum of 20 years.

In compliance with Internal Revenue Service (IRS) regulation, an ‘intent to borrow’ motion must be approved by the Board before expenditures are incurred on a project that may be financed with tax-exempt financing. The Board previously adopted ‘intent to borrow’ motions for the projects. The current motion supplements the prior motions to account for the increase in estimated project costs. Before a bond is actually authorized or issued, a public hearing will be held. Subsequent to the hearing, the Board will consider authorizing the bond.

FISCAL REVIEW / FUNDING

The bond is in the proposed 2024 Budget.

LEGAL REVIEW

Corporate Counsel reviewed the proposed motion and approved it as to form.

CONCLUSION(S)

Staff recommends that the Board approve the proposed motion. The Committee agreed the proposed motion be forwarded to the full Board for their consideration.

ATTACHMENT(S)

A. Full Form of the Motion

Resolution 23-013
DECLARATION OF OFFICIAL INTENT PURSUANT TO
TREASURY REGULATION §1.150-2

WHEREAS, the Portland Water District (the “Issuer”) intends to proceed with the projects described in section 2 below (the “Projects”); and

WHEREAS, the Issuer intends to finance some or all of the costs of the Projects through the issuance of tax-exempt bonds or notes in anticipation thereof; and

WHEREAS, the Issuer may incur and pay certain of the costs of the Projects prior to the issuance of such bonds or notes and the Issuer expects to reimburse itself for such costs from the proceeds thereof; and

WHEREAS, Treasury Regulation §1.150-2 requires that the Issuer declare its official intent to reimburse itself for such expenditures with the proceeds of such bonds or notes.

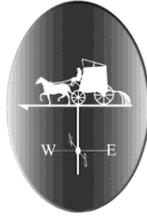
NOW, THEREFORE, the Issuer does hereby declare its official intent as follows:

1. **Declaration of Intent.** The Issuer reasonably expects to reimburse itself for expenditures made on the Projects with the proceeds of tax-exempt bonds or notes in anticipation thereof to be issued by the Issuer to finance the costs of the Projects in the maximum principal amount of \$700,000.
2. **General Description of Property to which Reimbursement Relates.** The following is a reasonably accurate general functional description of the type and use of the property with respect to which reimbursements will be made:

Water Fund CIP Projects

- Purchase of Hydro Vacuum Excavator and related equipment

3. **Public Availability of Official Intent.** This Declaration of Official Intent shall be maintained as a public record of the Issuer.
4. **Treasury Regulations.** This is a declaration of official intent pursuant to the requirements of Treasury Regulations § 1.150-2.
5. **Authority for Declaration.** This Declaration of Official Intent is adopted pursuant to the following action of the Issuer: Resolution adopted by the Portland Water District Board of Trustees.
6. **Supplement to Prior Declarations.** This Declaration of Official Intent supplements the prior Declarations of Official Intent, comprised of Resolutions 20-016, 21-018 and 22-15 previously adopted by the Portland Water District Board of Trustees, to account for an increase in estimated project costs.



Portland Water District
From Sebago Lake To Casco Bay

BOARD OF TRUSTEES / AGENDA ITEM SUMMARY

Agenda Item: 7E Order 23-037
Date of Meeting: October 23, 2023
Subject: Contract for the Billing System Testing Software and Related Implementation Services
Presented By: Peter Cutrone, Project Manager-Administration

RECOMMENDATION

The following proposed language is presented for Board of Trustee approval:

ORDERED, the General Manager is hereby authorized to execute a contract with E-Source, not to exceed \$178,500, for the purchase of computer system testing software and related implementation services, and

BE IT FURTHER ORDERED, that the 2023 capital improvement plan is hereby amended by increasing it by \$178,500; and that the General Manager, and the Treasurer, each acting singly, are authorized to take such steps as may be necessary to accomplish the intent of the vote.

BACKGROUND ANALYSIS

Software testing is critical when implementing and maintaining core business systems. This is especially true for customer-facing applications such as the Cayenta Billing system. Software is not static but undergoes continual development and improvement by the provider. Staying up to date with versions is an expectation for provider support.

PWD has a very thorough manual testing regimen to ensure no unintended consequences or errors occur for any change to the system. The resources and effort to do the complete testing are significant. Currently, PWD employs four people for an estimated four weeks at a total cost of roughly \$41,072 (labor with benefits). These resources must be taken away from their normal duties, which include customer service and billing functions.

Staff have researched and found a software product that will automate much of the testing effort and provide an opportunity to keep up with the continual updates Cayenta makes to the application. The automated solution is configured around PWD business processes and is repeatable and reusable. Use of the application will result in savings year over year. After implementing the solution for automated testing, the ongoing effort to test Cayenta updates is expected to be approximately one week or \$10,268 resulting in an annual savings of \$30,804.

The return on investment, including the three-year support agreement is seven years. Most importantly, the time savings allows Customer Service staff to focus on their core duties and other projects such as meter replacement, meter reading optimization, or daily routine efficiency gains by assessing business practices and new features in the software.

FISCAL REVIEW/FUNDING

This project will be funded from the water and wastewater renewal and replacement funds. An annual maintenance agreement cost of \$28,500 will be allocated to the Customer Service Department budget and distributed to the appropriate funds.

LEGAL REVIEW

Corporate Counsel has reviewed the proposed order as to form.

CONCLUSION(S)

Staff recommends the contract with E-Source be authorized. The Committee agreed to forward to the full Board for their consideration.

ATTACHMENT(S)

A. Additional Background Information

Additional Background Information

Testing is a critically important practice to ensure and maintain the accuracy of our customer information, billing, payment processing, collections, and customer experience. Too often, utility software implementations and upgrades that fail because of inadequate testing appear in the news.

PWD has always maintained a thorough testing protocol for our core systems. For the Cayenta system, the District currently has 449 defined tests to prove the system for any patches, updates, or version upgrades to the software. These scenarios are specific to PWD and our work processes as well as our regulatory environment. See Figure 1 below for the testing profile.

The commitment to testing requires a significant draw on resources. Past experience of unintended consequences resulting from a “minor” change has led PWD to adopt the approach to test more rather than less. To test the 449 scenarios and prove the software PWD draws on four people for four full weeks. Any work they have is either put on hold or distributed to others.

Finding the time where PWD can coordinate the needed people is exceptionally challenging. PWD has been searching for more efficient ways to complete testing without compromising quality or thoroughness. At a conference PWD staff attended last fall they were introduced to an automated testing solution that was developed for another Cayenta client. PWD staff sat through several demonstrations of the product offered by ESource and feel this is the best option.

Included below (see Table 1) is a list of the various test group features covered by ESource’s NavigateOne testing solution. PWD’s 449 scenarios fit into these. The solution is a collection of programmed scripts that emulates an end user as well as normal scheduled jobs and functions. These scripts can be selected one by one or run as a complete collection. PWD can run on demand or schedule to run overnight and the results are reviewed. This can reduce the effort from a four-week engagement to a one-week engagement. The Return on Investment (ROI) is projected at seven years.

Another value add of this solution is Performance Testing. One of the references talked about how they run this on a regular basis just to make sure the system is healthy. Currently, PWD does not have this ability.

There is some implementation to set the solution up tailored to PWD but after that it is reusable. The scripts are written in Java code and are accessible to PWD staff to edit for any changes in our processes or allow PWD to build new work processes into the testing run.

In addition to the purchase and implementation, PWD has negotiated a 3-year support agreement (annual amount of \$28,500) which will be allocated to the Customer Service Department budget and distributed to the appropriate funds.

Figure 1. Portland Water Testing Profile

1 - Test Accounts	364
Account Location Person Maintenance (PALS)	9
Adjustments	6
Bankruptcy	1
Bill Hold	1
Bill Print	
Billing	5
CIS Inquiry	1
Claims	1
Collections	5
Comments	1
Dispute & Reminders	2
Estimating	1
HILO - Usage Management	1
Medical Emergency	1
Meter Reading	1
Meters	8
Move In Move Out	5
Payments	9
PWD Request Matrix	1
Rates	1
Refunds	1
Revenue Protection	3
Seasonals	7
Service Lines	3
Sewer Turnover	1
Shuts	2
Submeters	4
Thomas Agency	2
Water Quality	1
Write Offs	1



Table 1. Feature, Advantages, Benefits (FAB) Analysis NavigateOne Automation (Cayenta Focused):

Feature (Definition)	Advantages with NavigateOne Testing	Benefits of NavigateOne Automation
<p>Smoke Testing A set of tests that validates critical functionality of the CIS system is stable</p>	<ul style="list-style-type: none"> □ Exposes issues with the change (integration/build) □ Discover potential issues early □ Instills confidence that the new software version or changes have not adversely impacted core functionality 	<ul style="list-style-type: none"> □ Ease of execution (click and run) □ Ease of result reporting □ Fast execution, saves time and resources
<p>Regression Testing Ensures that a software update does not affect CIS business critical functionality, as determined by the utility</p>	<ul style="list-style-type: none"> □ Increases the product's quality □ Ensures bug fixes or changes did not impact the existing functionality □ It makes sure the issues fixed don't reoccur 	<ul style="list-style-type: none"> □ Tests critical functionality with client configuration □ Eliminates redundancy of effort into repetitive testing □ Provides data for intelligent decision making
<p>Rates Testing Testing rate changes at the account level. Multiple cycles of rate charges are run before, during, and after a rate change period</p>	<ul style="list-style-type: none"> □ Run in conjunction with Regression testing to ensure the rates and bill calculations are stable □ Identifies and helps mitigate potential impacts of rate changes before they reach customers 	<ul style="list-style-type: none"> □ Can test multiple accounts, rates, and cycles with specific data as determined by the users □ Customizable results to identify calculations at DB level
<p>Bill Comparison/Parallel Testing Testing to make sure an entire cycle's bills in the Test system AFTER a build is applied match the same cycle's bills in Production for the same reads</p>	<ul style="list-style-type: none"> □ Charges validated both at account level and DB level □ Validations done at bill print level (number of bills in the XML/PDF file) □ Bill Prints in the PDF (on the print-vendor side) 	<ul style="list-style-type: none"> □ Automated Bill Processing scripts for billing and bill printing can be run overnight □ Charges are automatically validated on the backend (290T, 265T etc. tables) and differences in charges are automatically highlighted in Excel files

<p>Performance Testing Testing approach to validate the performance of an application under load</p>	<ul style="list-style-type: none"> □ Ensures CIS system is performing at the same or better level prior to upgrade □ Ensures response times are captured at UI level 	<ul style="list-style-type: none"> □ Eliminates potential 'human errors' in capturing response times □ Provides quantifiable data and verifiable output with actionable results
<p>Data Staging and Selection Time required to create or modify accounts, run, and update batches for payments, bills, and collections etc.</p>	<ul style="list-style-type: none"> □ Analyze and determine data setup pre-requisites for running test scenarios □ Prepare test plans to optimize data setup effort □ Implement reusability to save time 	<ul style="list-style-type: none"> □ Automated scripts for data setup and generation □ Automation scenarios can be setup to create their own data based on pre-defined criteria
<p>Ease of Defect Reporting NavigateOne framework that supports collecting defects & documentation</p>	<ul style="list-style-type: none"> □ Identifies the best way to recognize, document, track, and close defects □ Implementing industry best practices in defect reporting. □ Use ALM (NavigateOne), a client-preferred tool (SharePoint, DevOps, JIRA), or CayStone with potential integration with Automation Tool 	<ul style="list-style-type: none"> □ Automation tool documents test steps and results without manual intervention: <ul style="list-style-type: none"> • Captures pass/fail results • Captures associated screen shots (user story) • Captures database entries (where necessary) □ Can Integrate with most defect management tools (ALM, CayStone, etc.) to automatically capture testing results