



Operations Monitoring Report

First Quarter FY23

Prepared by:

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October 31, 2022

I. Executive Summary

A review of the fiscal year 2023 (FY23) First Quarter performance and contract obligations between Constellation Energy Solutions, LLC. (CES) and the Metropolitan Government of Nashville and Davidson County (Metro) is presented in this report by Thermal Engineering Group, Inc. (TEG). The status of the available funds for all active capital construction and repair and improvement projects is also presented. For the fiscal year 2023 to date, CES has failed to meet the performance guarantees for each month during and for the twenty-four consecutive months of FY21 and FY22 as required by Paragraph 8.d of the Amendment 2 of the Amended and Restated DES Management Agreement (ARMA) between Metro and CES and Section 18 of the ARMA. TEG continues to monitor CES's operations.

Metro asked CES during the First Quarter FY22 for a plan to bring the operation of the EGF (Energy Generating Facility) into compliance with the new performance guarantees. CES provided a draft report from their engineer during the Second Quarter FY22. A virtual meeting was held between Metro, CES, and their engineer during that quarter to discuss the report. The recommendations made by CES are currently being evaluated by their engineer and will be presented to Metro once the evaluation is completed. Due to issues with the contract agreement between CES and their engineer, the final report containing the engineer's recommendations has been delayed as well as the implementation of any of the modifications necessary to return the operation of the DES to compliance with the performance guarantees.

For the First Quarter FY23, the chilled water sales increased 5.2% over the previous First Quarter (FY22). The chilled water sendout also increased 6.7% over the previous First Quarter. The system losses increased approximately 41.5%. The number of cooling degree days increased 16.0% resulting in greater chilled water sales. The peak chilled water demand for the current quarter was 18,360 tons, which is 0.3% lower than the previous First Quarter.

Steam sendout for the current quarter increased by only 3.7% over the previous First Quarter with steam sales increasing 17.2%. This increase came with a 14.3% decrease in heating degree days. Total steam system losses decreased 22.9% from the previous First Quarter. The peak steam demand for the current quarter was 60,337 pounds per hour, which represents an increase in the First Quarter demand by approximately 22.4%.

With the implementation of the new System Performance Guarantee (Guaranteed Maximum Quantity or GMQ) levels beginning in July 2020, CES has failed to consistently meet all of the metrics. CES met the electric conversion metrics for steam and chilled water for each month during the quarter but failed to meet the steam and chilled water-water conversion metrics each month and the steam fuel metric in August and September. CES continues to monitor their operation at the EGF to address the issues preventing them from meeting the new performance criteria. These changes have resulted in some improvements over the past two fiscal years. TEG is continuing to monitor CES's efforts in improving the system's performance.

Work continued with the DES Capital and Repair & Improvement Projects during the First Quarter. Repair and Improvements to the EDS continue as scheduled. DES139, DES143,

DES163, DES177, DES178, DES180, DES 189, DES191, DES192, DES193, DES194, DES195, DES 196, DES198, DES199, DES201, DES202 and DES203 are ongoing. As noted in prior quarterly monitoring reports, the postponement or deferral of these items will result in an increase in maintenance costs to the DES and could impact the delivery of steam and chilled water. Project DES204 has been added. Projects DES133.1, DES154, DES179, DES188 and DES197 are closed or are in close-out.

The current fiscal year system operating costs to date are \$5,728,864. This value represents approximately 27.9% of the total budgeted operating cost for FY23. The customer revenues from the sales of steam and chilled water for FY23 are \$5,738,040 (28.5% of budgeted amount) which includes the annual true-up amount for FY22. The Metro funding amount transferred to date for FY23 is \$92,575 (25% of budget). The expenses to date do not include any of the liaison salaries and benefits nor do they reflect confirmation of all of the self-funded debt service payments for the quarter. Upon confirmation of these expenses, the First Quarter expenses will be updated in the Second Quarter Monitoring report. The actual MFA can only be estimated due to outstanding invoices as of the date of this report and an audit of the customer revenues has not been performed which will be included in the FY23 True-up analysis.

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II. Energy Distribution Sales and Performance

A. Chilled Water

This section of the report discusses and presents performance information regarding the operation of the EGF for the periods described. Charts and tabular data are also presented to provide a more detailed description of the actual EGF performance.

1. Sales and Sendout

A comparison for the First Quarter chilled water sales is shown in Figure 1. This data reflects a 5.2% increase in sales for the current quarter over the same quarter of the previous fiscal year.

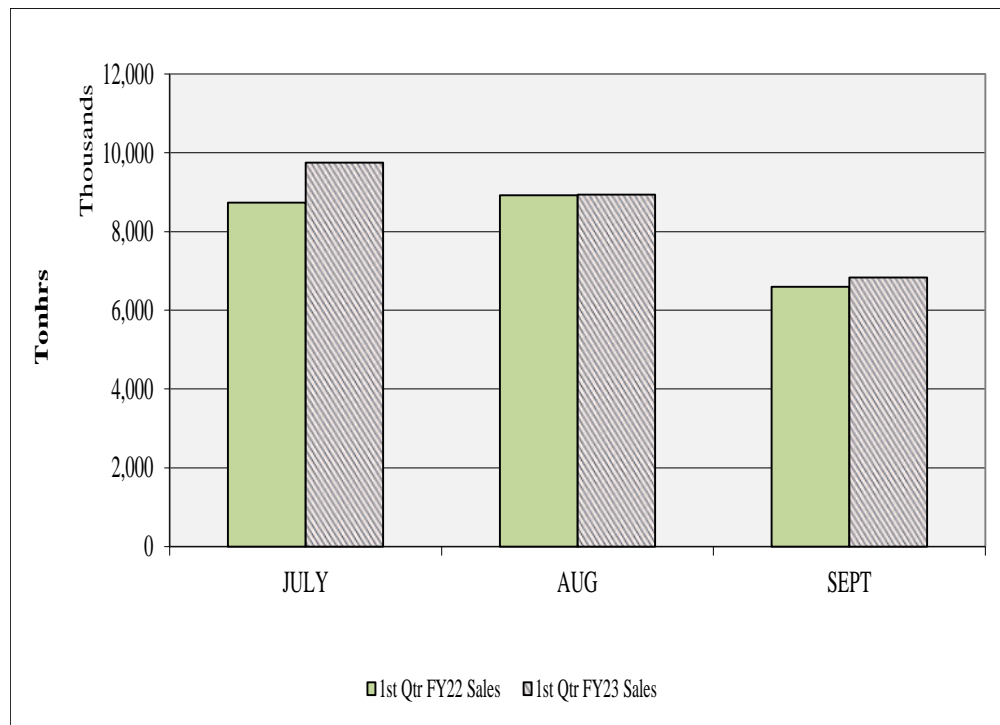


Figure 1. Chilled Water Sales Comparison

The peak chilled water demand for the current quarter was 18,360 tons, which represents negligible change over the previous First Quarter. The number of cooling degree days were 16.0% higher in FY23 than in FY22.

Figure 2 shows the chilled water sales, sendout and losses for the previous twelve months. The losses on this figure are defined as the difference in tonhrs per month between the recorded sendout and sales values and represent the total energy loss for chilled water in the EDS. The number of cooling degree days per month are also tracked for comparison.

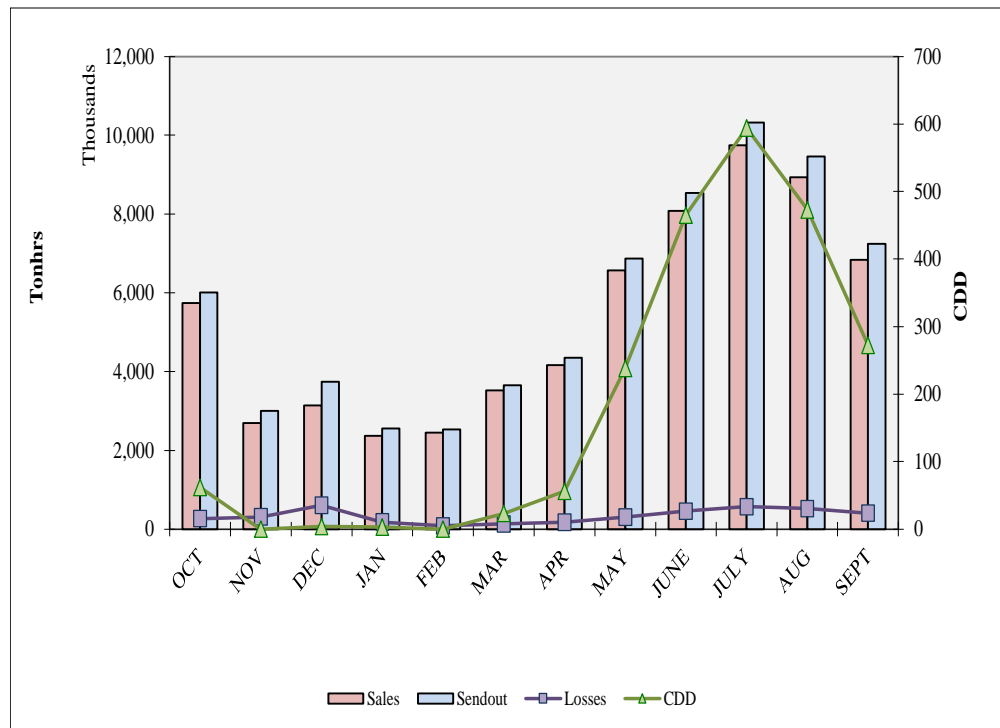


Figure 2. Chilled Water Sales, Sendout, Losses and CDD for the Previous Twelve Months

2. Losses

A comparison of the total chilled water energy losses in the EDS for the First Quarter is shown in Figure 3. These losses are the difference in chilled water sendout and sales.

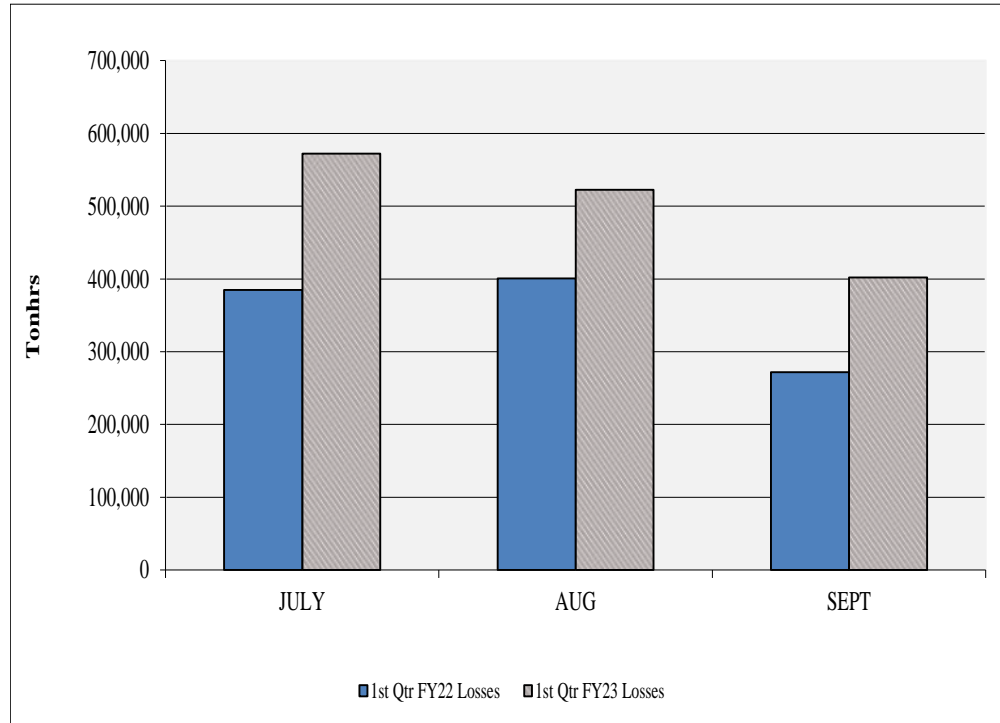


Figure 3. Chilled Water System Loss Comparison

The EDS make-up decreased by 84.7% over the previous First Quarter due to the repair in January 2022 of the chilled water leak on 3rd Ave North near where a repair had previously been made. The make-up dropped dramatically after the repairs were made and have remained relatively low since that time, although there were occasional increases in make-up due to repairs made by customers at their buildings.

Another leak is still suspected on 5th Ave N, but previous efforts to locate the actual source of the leak have been unsuccessful. CES and TEG are continuing to monitor the EDS make-up and investigate any potential leaks. If the specific location of an additional leak is discovered, DES will address the issue promptly.

The make-up to the cooling towers increased 7.6% over the previous First Quarter. The water usage in the cooling towers is typically proportional to the consumption of chilled water and should vary with chilled water sales. The number of cycles of concentration in the condensing water circuit increased 5.5%. The total chiller plant water use decreased 2.0% over the First Quarter FY22. The overall city water make-up comparison for the chilled water system First Quarter is shown in Figure 4.

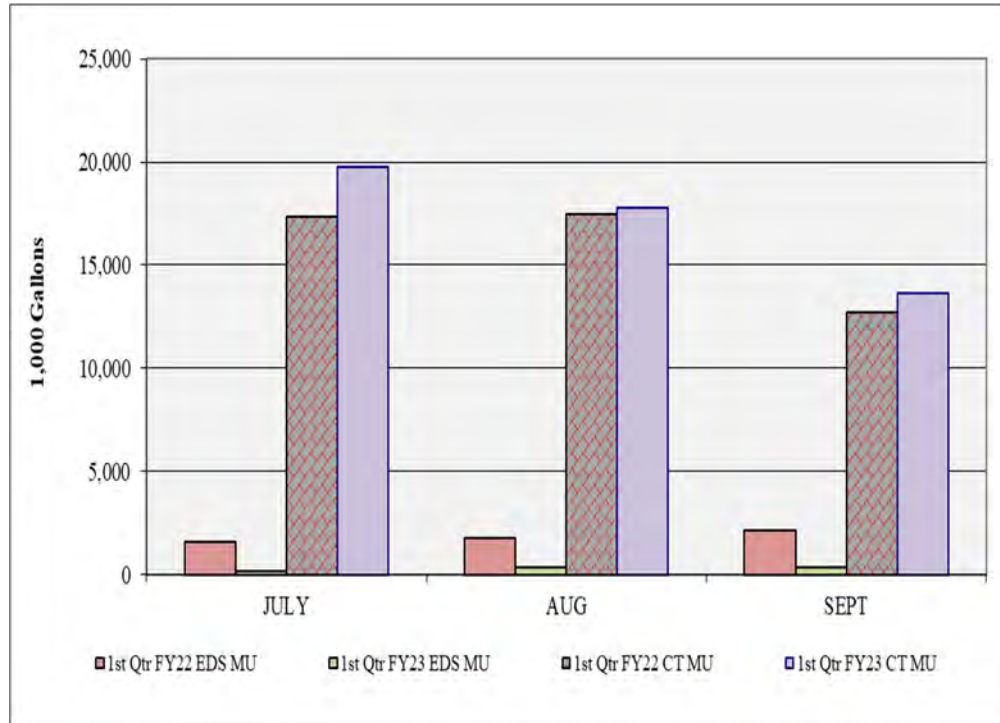


Figure 4. Chilled Water System City Water Usage Comparison

3. Performance

The performance of the chilled water aspect of the EGF is presented by the following two charts, Figures 5 and 6, for the previous twelve months. The System Performance Guarantee levels as described in Amendment 2 of the ARMA were not consistently achieved for the chilled water-water conversion for FY23. CES has met the chilled water-electric guarantee for each month during the First Quarter.

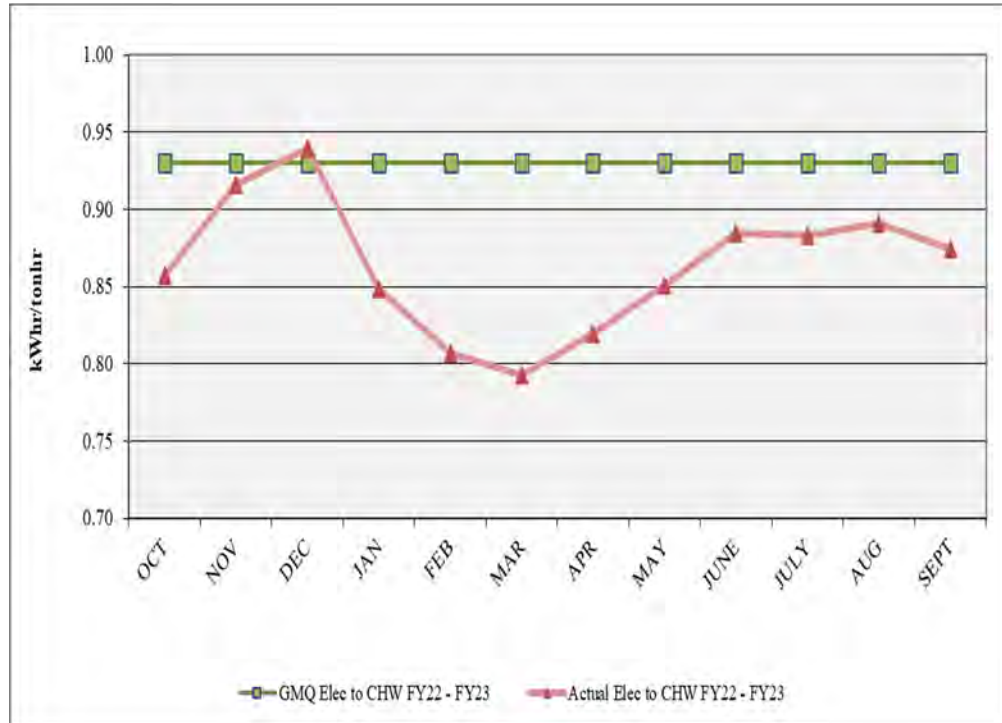


Figure 5. Chiller Plant Electric Performance Guarantee Comparison for the Previous Twelve Months

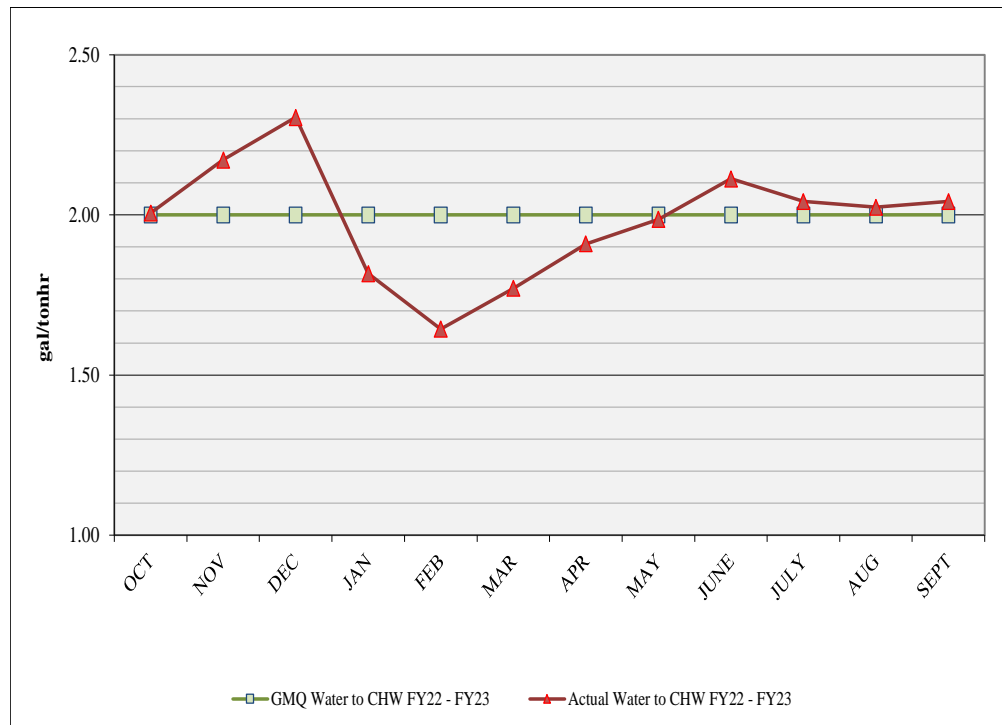


Figure 6. Chiller Plant Water Consumption Performance Guarantee Comparison for the Previous Twelve Months

The chilled water allocation of the electric consumption falls under the GMQ limit of 0.93 kWhr per tonhr for the current quarter on average with only no excursions reported for the current fiscal year. The electric usage per unit of sales increased 0.5% over the previous First Quarter.

CES has worked to address some operational issues within the plant in an additional effort to improve efficiency. CES and TEG are continuing to monitor the improvements created by these changes.

The total consumption of city water for the chiller plant for the current quarter has decreased by approximately 2.0% over the previous First Quarter due largely to the repair of the chilled water leak in the EDS. The water conversion factor for the chiller plant decreased by approximately 1.7% (on average) over the First Quarter FY22. The cooling tower blowdown increased 2.9% over the previous First Quarter.

B. Steam

1. Sales and Sendout

The steam sendout increased by approximately 3.7% over the previous First Quarter (FY22), and the sales increased by approximately 17.2%. The Quarter experienced a 14.3% decrease in the number of heating degree days. The steam system losses decreased 22.9%, and the relative amount of condensate return decreased 9.9% during the quarter due dumping part of the condensate due to hardness and iron at some of the customer buildings. A comparison for the First Quarter steam sales is shown in Figure 7.

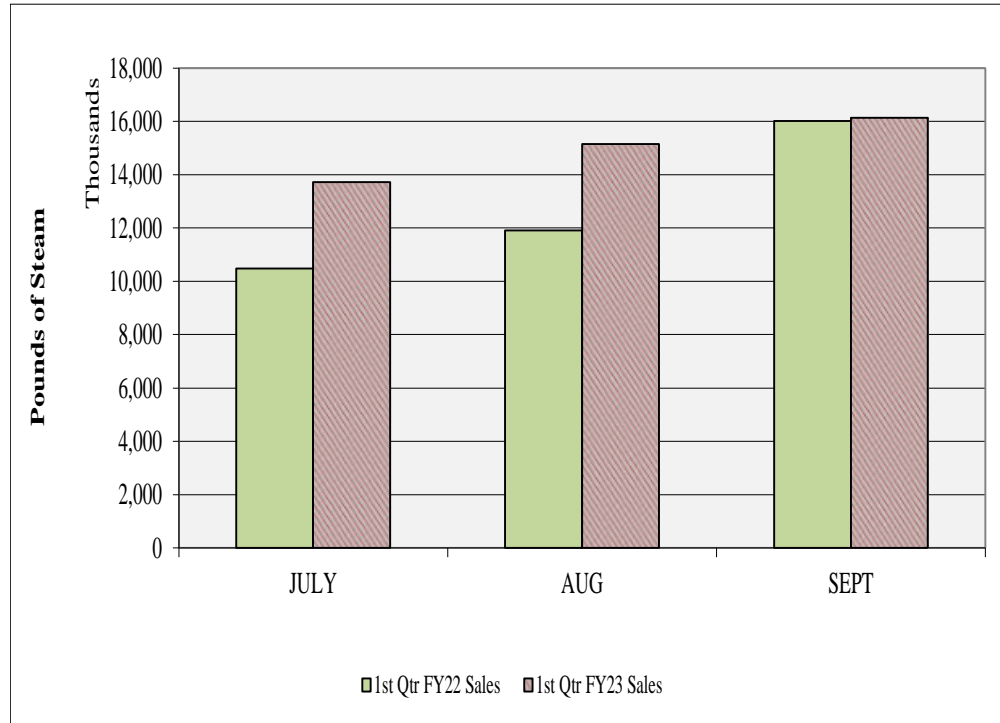


Figure 7. Steam Sales Comparison

The peak steam demand for the current quarter was 60,337 pph, which reflects an approximate 22.4% increase in the peak steam production over the previous First Quarter.

Figure 8 shows the steam sales, sendout and losses for the previous twelve months. The losses on this figure are defined as the difference in pounds per month between the recorded sendout and sales values and represent the total mass loss in the EDS between the EGF and the customer meters.

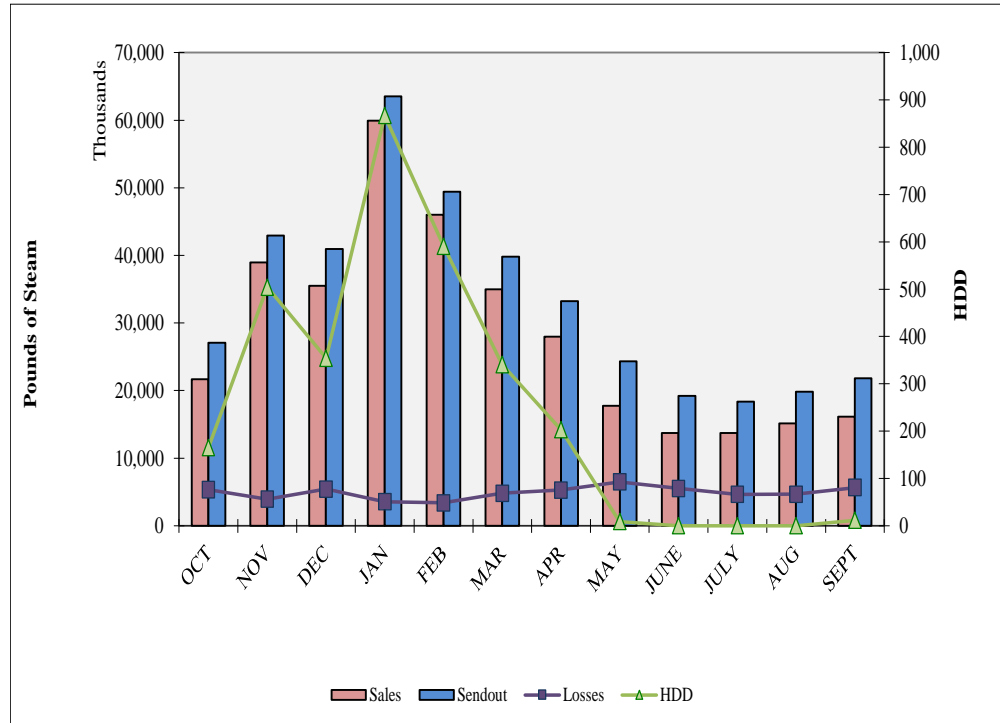


Figure 8. Steam Sales, Sendout, Losses and HDD for the Previous Twelve Months

2. Losses

A comparison of the total steam mass losses in the EDS for the First Quarter is shown in Figure 9. The mass loss is caused by the heat loss in the EDS between the EGF and the customer meters, resulting in a mass loss at steam traps. Faulty traps, steam leaks or meter error could also be a contributing cause of these losses. Whenever steam sales decrease from the previous quarter, the percent of system losses can be expected to increase since most of these losses are based on a near constant heat loss of the system.

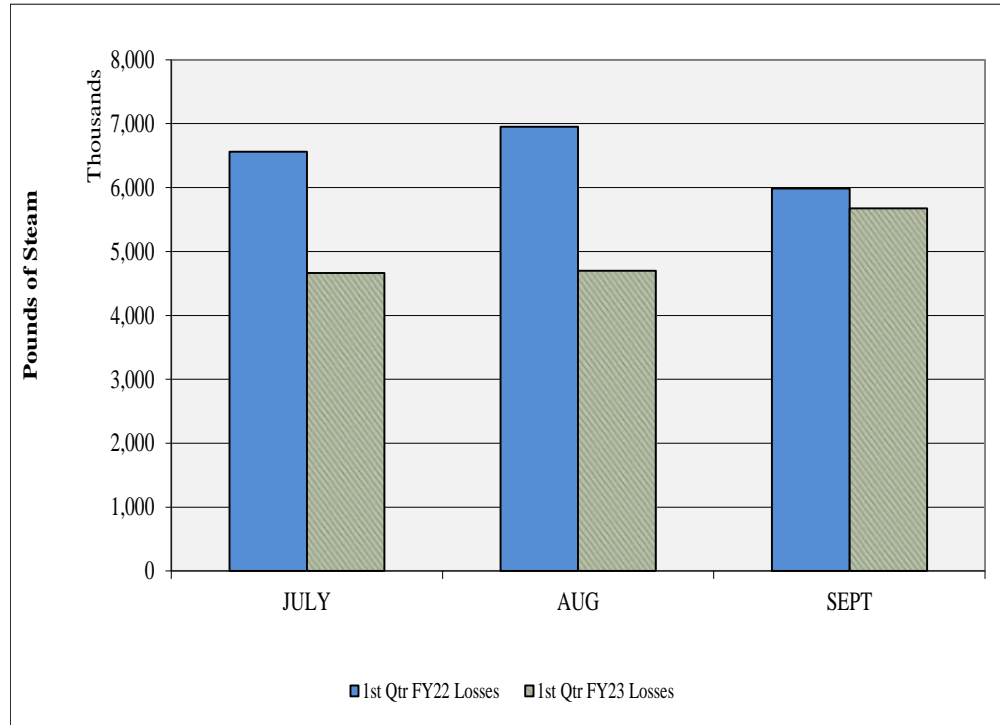


Figure 9. Steam System Losses

The amount of city water make-up (MU) to the steam system consists of the loss in mass between the EGF and the customers, in the condensate return from the customers to the EGF and losses at the EGF. The corresponding data for steam system make-up is shown in the comparison of First Quarter data in Figure 10.

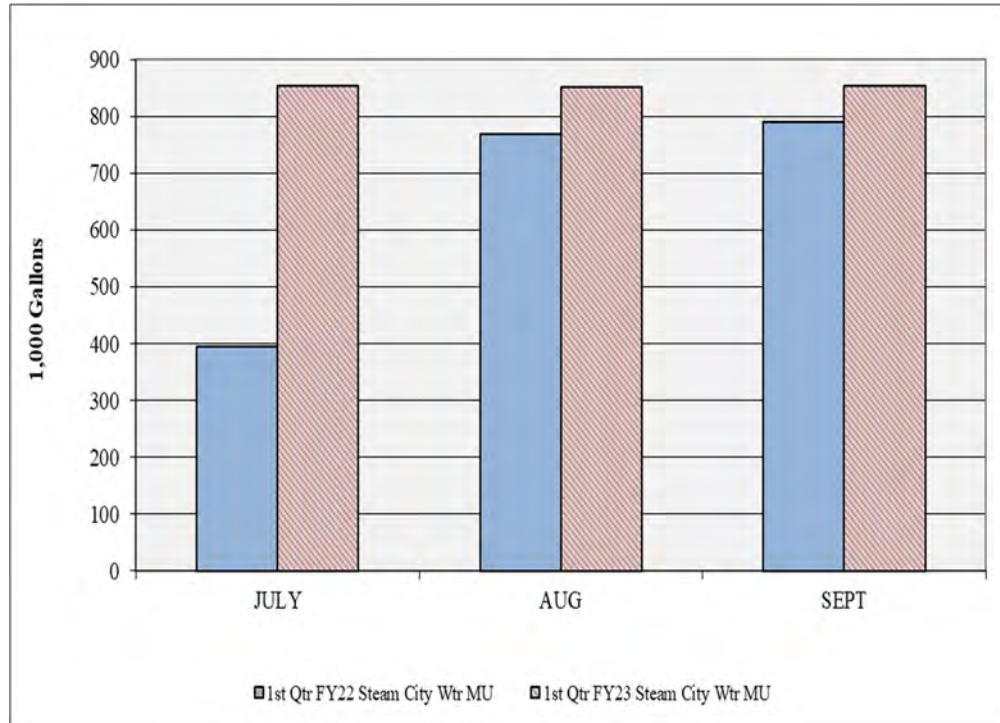


Figure 10. Steam System City Water Make-up Comparison

3. Performance

The performance of the steam system of the EGF is presented by the following three charts, Figures 11, 12 and 13. The steam fuel conversion factor exceeded the guaranteed values for August and September 2022; however, the differences between the actual and guaranteed values were small. The steam electric conversion factor was met each month of the quarter. The steam water conversion factor exceeded the guaranteed values for each month in the quarter. TEG monitors CES’s performance regularly and will continue to report any non-compliance in the EGF’s operation.

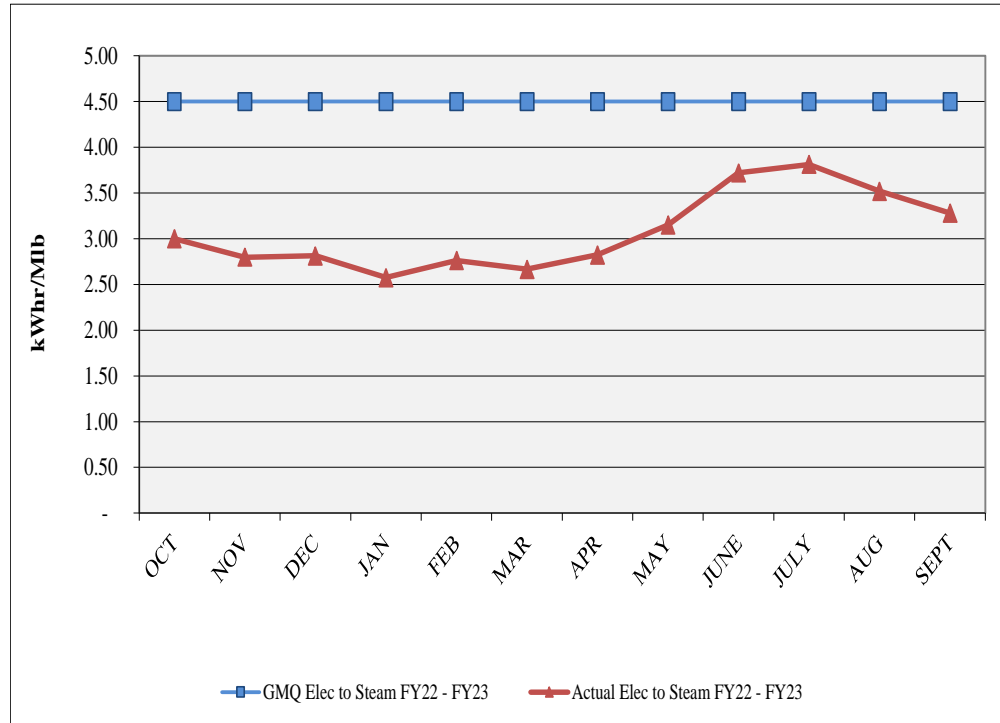


Figure 11. Steam Plant Electric Performance Guarantee for the Previous Twelve Months

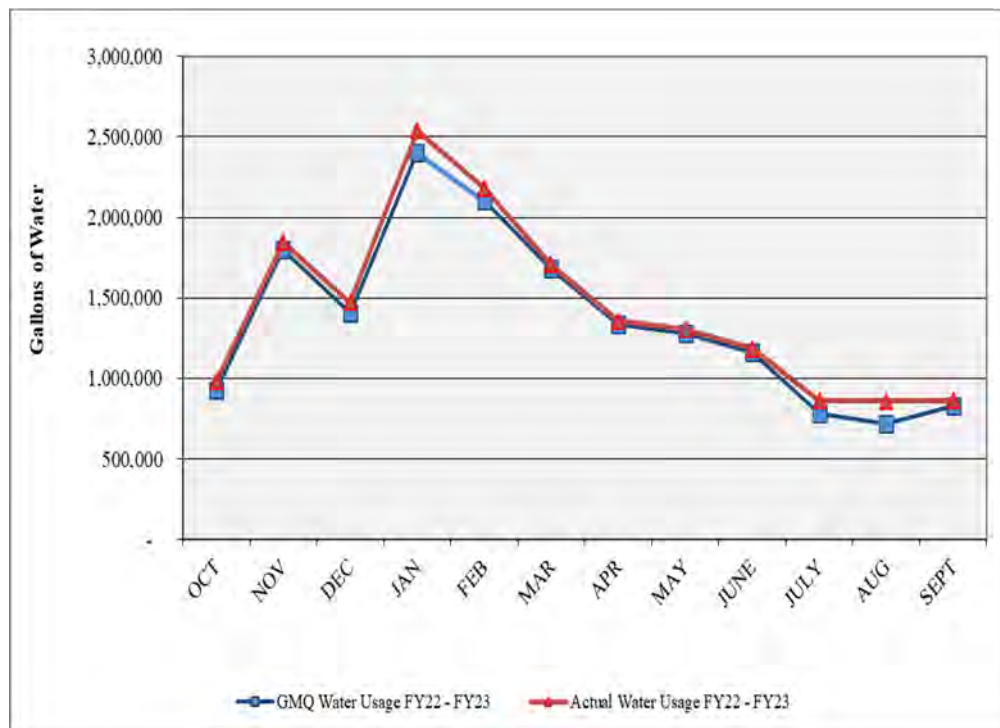


Figure 12. Steam Plant Water Performance Guarantee for the Previous Twelve Months

The steam plant electric consumption for the current quarter was 2.4% higher in FY23 than in FY22. The steam-to-electric conversion factor decreased 14.8% over the same period. The monthly steam-to-electric conversion factors, along with the guaranteed values, are shown in Figure 11.

The water consumption for the steam plant increased 31.0% this quarter as compared to the previous First Quarter due to a decrease in the amount of condensate returned during the quarter. Figure 12 shows the comparison between the actual and guaranteed steam-to-water usages for each month.

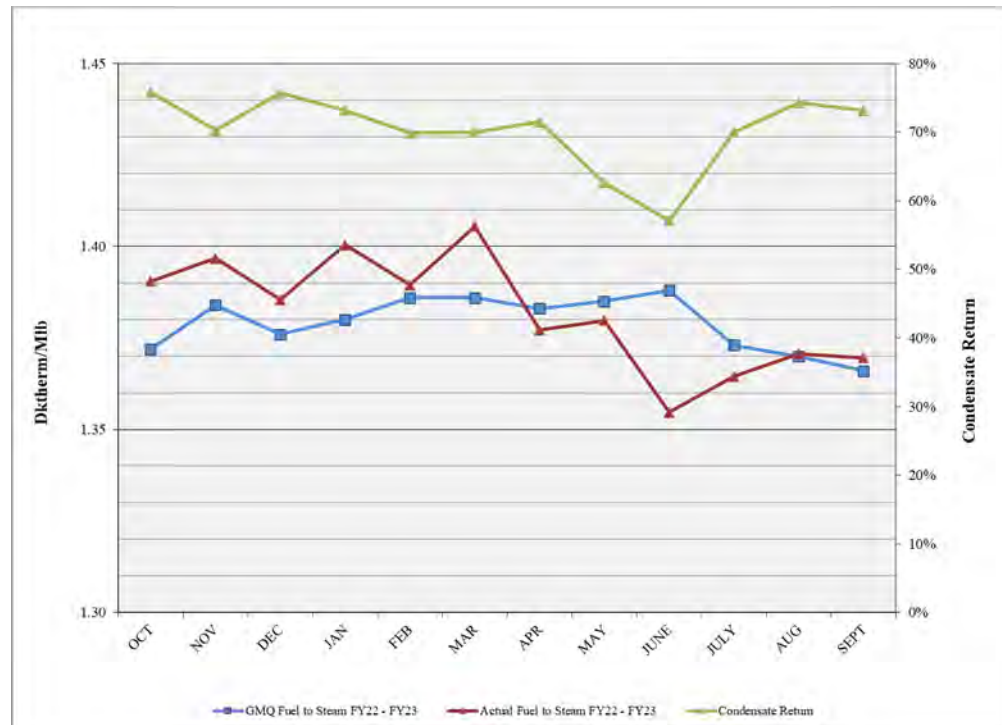


Figure 13. Steam Plant Fuel Performance Guarantee for the Previous Twelve Months

The fuel consumption per unit of steam sendout remained approximately the same as in the previous First Quarter. As shown in Figure 13, the performance guarantee was met in July but not in August or September. The relative amount of condensate return is shown on this graph to reflect the influence that the condensate return has on the plant efficiency.

C. Contract Guarantee Performance

The production and sales performance for the EGF and EDS are summarized in Table 1 for the current quarter. Additional parameters, such as cooling tower blow-down and peak demands are listed in this table, as well. Table 2 presents the First Quarter comparisons of

the Guaranteed Maximum Quantities (GMQ) or System Performance Guarantees of the criteria commodities (fuel, water, and electricity).

CES failed to meet all of the performance guarantees required under Amendment 2 of the ARMA for the quarter but some improvement in the operation of the EGF is noted.

Table 1. First Quarter FY23 Production, Sales, and Consumption Summary

| Item | Unit | First Quarter FY23 | First Quarter FY22 | *Percent Difference |
|---------------------------|--------|-----------------------|-----------------------|------------------------|
| | days | 92 | 92 | 0.00% |
| Total Electric Use | kWhrs | 22,707,264 | 21,455,904 | 5.83% |
| Chilled Water | kWhrs | 22,548,696 | 21,301,060 | 5.86% |
| Steam | kWhrs | 158,568 | 154,844 | 2.41% |
| Total Water Use | kgal | 54,518 | 54,990 | -0.86% |
| Total Chilled Water | kgal | 51,961 | 53,038 | -2.03% |
| EDS Make-up | kgal | 848 | 5,545 | -84.71% |
| Cooling Towers | kgal | 51,113 | 47,493 | 7.62% |
| Calc CT Evaporation | kgal | 42,516 | 39,141 | 8.62% |
| CT Blowdown | kgal | 8,597 | 8,352 | 2.93% |
| Calc # Cycles | | 4.95 | 4.69 | 5.53% |
| Steam | kgal | 2,557 | 1,952 | 30.99% |
| Total Fuel Use | mmBTU | 82,166 | 79,291 | 3.63% |
| Natural Gas | mmBTU | 82,166 | 79,291 | 3.63% |
| Propane | mmBTU | 0 | 0 | 0.00% |
| Condensate Return | kgal | 5,340 | 5,718 | -6.60% |
| | lbs | 43,554,988 | 46,631,480 | -6.60% |
| Avg Temp | °F | 181.0 | 176.0 | 2.84% |
| Sendout | | | | |
| Chilled Water | tonhrs | 27,020,600 | 25,315,400 | 6.74% |
| Steam | lbs | 60,047,000 | 57,909,000 | 3.69% |
| Peak CHW Demand | tons | 18,360 | 18,414 | -0.29% |
| Peak Steam Demand | lb/hr | 60,337 | 49,300 | 22.39% |
| CHW LF | | 66.65% | 62.26% | 7.05% |
| Steam LF | | 45.07% | 53.20% | -15.28% |
| Sales | | | | |
| Chilled Water | tonhrs | 25,523,222 | 24,257,500 | 5.22% |
| Steam | lbs | 45,008,908 | 38,404,964 | 17.20% |
| Losses | | | | |
| Chilled Water | tonhrs | 1,497,378 | 1,057,900 | 41.54% |
| Steam | lbs | 15,038,092 | 19,504,036 | -22.90% |
| | | 25.04% | 33.68% | -25.64% |
| Degree Days | | | | |
| CDD | | 1,339 | 1,154 | 16.03% |
| HDD | | 12 | 14 | -14.29% |

*positive percent difference values imply an increase from FY22 to FY23

Table 2. First Quarter Performance Guarantee Comparison for Steam and Chilled Water

| GMQ Calculations | Unit | First Quarter FY23 | First Quarter FY22 |
|----------------------|------------|-----------------------|-----------------------|
| Steam | | | |
| GMQ Elec Conversion | kWhr/Mlb | 4.50 | 4.50 |
| Electric Conversion | kWhr/Mlb | 3.54 | 4.15 |
| GMQ Plant Efficiency | Dth/Mlb | 1.370 | 1.363 |
| Plant Efficiency | Dth/Mlb | 1.368 | 1.369 |
| Actual %CR | | 72.53% | 80.53% |
| Avg CR Temp | °F | 181 | 176 |
| GMQ Water Conversion | gal | 2,325,425 | 1,590,165 |
| Water Conversion | gal | 2,582,570 | 1,971,520 |
| Chilled Water | | | |
| GMQ Elec Conversion | kWhr/tonhr | 0.930 | 0.930 |
| Electric Conversion | kWhr/tonhr | 0.883 | 0.878 |
| GMQ Water Conversion | gal/tonhr | 2.00 | 2.00 |
| Water Conversion | gal/tonhr | 2.04 | 2.07 |

*positive percent difference values imply an increase from FY22 to FY23

D. Operating Costs

The fixed operating costs for the DES include the management fee to CES, debt service payments on the bonds and engineering and administration costs and are charged to the Initial System Customers (ISCs) relative to their contract demand. For all non-ISCs, their fixed costs are principally based on a value established by their contracts and are not tied directly to the actual costs of the debt service or CES's management fee.

The variable costs are dependent on the amounts of steam and chilled water produced and sold to the customers. These latter costs include the utility and chemical treatment costs and are passed onto the customers directly without mark-up. A summary of the total operating costs for the fiscal year to date are shown in Table 3.

The revenues shown in Tables 3 and 4 reflect the charges to the customers for their respective steam and chilled water service. The difference between the total costs and revenues from the customers is the shortfall that must be covered by Metro. The shortfall exists due to the remaining unsold capacity at the EGF and the debt service for bonds to which the customers do not directly contribute.

The current fiscal year system operating costs to date are \$5,728,864. This value represents approximately 27.9% of the total budgeted operating cost for FY23. The customer revenues from the sales of steam and chilled water for FY23 are \$5,738,040 (28.5% of budgeted amount) which includes the annual true-up amount for FY22. The Metro funding amount transferred to date for FY23 is \$92,575 (25% of budget). The expenses to date do not include any of the liaison salaries and benefits nor do they reflect confirmation of all of the self-funded debt service payments for the quarter. Upon confirmation of these expenses, the First Quarter expenses will be updated in the Second Quarter Monitoring report. The actual MFA can only be estimated due to outstanding invoices as of the date of this report and an audit of the customer revenues has not been performed which will be included in the FY23 True-up analysis.

Table 3. DES Expenses and Revenues to Date

| Item | FY23 Budget | First Quarter Expenses | Second Quarter Expenses | Third Quarter Expenses | Fourth Quarter Expenses | Total Spending to Date | % of Budget |
|---|----------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|---------------|
| Operating Management Fee | | | | | | | |
| FOC: Basic | \$ 4,006,800 | \$ 1,001,705 | \$ - | \$ - | \$ - | \$ 1,001,705 | 25.00% |
| 9th Chiller | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | n.a. |
| C/O 6A | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | n.a. |
| C/O 6B | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | n.a. |
| C/O 7 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | n.a. |
| C/O 8 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | n.a. |
| Pass-thru Charges: Chemical Treatment | \$ 255,700 | \$ 57,601 | \$ - | \$ - | \$ - | \$ 57,601 | 22.53% |
| Insurance | \$ 22,900 | \$ - | \$ - | \$ - | \$ - | \$ - | 0.00% |
| Marketing: CNE Sales Activity | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | n.a. |
| Incentive Payments | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | n.a. |
| FEA: Steam | \$ 84,700 | \$ (441) | \$ - | \$ - | \$ - | \$ (441) | -0.52% |
| Chilled Water | \$ 126,200 | \$ 25,885 | \$ - | \$ - | \$ - | \$ 25,885 | 20.51% |
| Misc: Metro Credit | \$ - | \$ (415,775) | \$ - | \$ - | \$ - | \$ (415,775) | n.a. |
| ARFA | \$ 63,000 | \$ 15,754 | \$ - | \$ - | \$ - | \$ 15,754 | 25.01% |
| Deferral | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | n.a. |
| Subtotal - Man Fee = | \$ 4,559,300 | \$ 1,100,504 | \$ - | \$ - | \$ - | \$ 1,100,504 | 24.14% |
| Reimbursed Management Fee + Chem Treatment | | \$ 366,943 | \$ - | \$ - | \$ - | \$ 366,943 | 0.00% |
| Metro Costs | | | | | | | |
| Pass-thru Charges: Engineering | \$ 129,500 | \$ 6,332 | \$ - | \$ - | \$ - | \$ 6,332 | 4.89% |
| EDS R&I Transfers | \$ 303,700 | \$ 75,925 | \$ - | \$ - | \$ - | \$ 75,925 | 25.00% |
| Metro Marketing | \$ 60,900 | \$ - | \$ - | \$ - | \$ - | \$ - | 0.00% |
| Project Administration | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | n.a. |
| Metro Incremental Cost | \$ 718,800 | \$ 92,812 | \$ - | \$ - | \$ - | \$ 92,812 | 12.91% |
| Utility Costs: Water/Sewer | \$ 759,700 | \$ 394,055 | \$ - | \$ - | \$ - | \$ 394,055 | 51.87% |
| EDS Water/Sewer | \$ - | \$ 31 | \$ - | \$ - | \$ - | \$ 31 | n.a. |
| EDS Electricity | \$ 71,700 | \$ 22,039 | \$ - | \$ - | \$ - | \$ 22,039 | 30.74% |
| Electricity | \$ 6,181,900 | \$ 2,297,773 | \$ - | \$ - | \$ - | \$ 2,297,773 | 37.17% |
| Natural Gas Consultant | \$ 12,400 | \$ - | \$ 6,000 | \$ - | \$ - | \$ 6,000 | 48.39% |
| Natural Gas Transport | \$ - | \$ 56,143 | \$ - | \$ - | \$ - | \$ 56,143 | n.a. |
| Natural Gas Fuel | \$ 3,203,850 | \$ 495,442 | \$ - | \$ - | \$ - | \$ 495,442 | 15.46% |
| Propane | \$ 139,050 | \$ - | \$ - | \$ - | \$ - | \$ - | 0.00% |
| Subtotal - Metro Costs = | \$ 11,581,500 | \$ 3,440,553 | \$ 6,000 | \$ - | \$ - | \$ 3,446,553 | 29.76% |
| Subtotal - Operations = | \$ 16,140,800 | \$ 4,541,057 | \$ 6,000 | \$ - | \$ - | \$ 4,547,057 | 28.17% |
| Debt Service | | | | | | | |
| 2012A Bonds | \$ 3,178,500 | \$ 869,138 | \$ - | \$ - | \$ - | \$ 869,138 | 27.34% |
| 2005B Bonds | \$ 281,100 | \$ 261,398 | \$ - | \$ - | \$ - | \$ 261,398 | 92.99% |
| Series 2018 | \$ 117,200 | \$ - | \$ - | \$ - | \$ - | \$ - | 0.00% |
| Series 2015C | \$ 64,700 | \$ - | \$ - | \$ - | \$ - | \$ - | 0.00% |
| Series 2017 | \$ 41,800 | \$ - | \$ - | \$ - | \$ - | \$ - | 0.00% |
| Series 2013A | \$ 506,000 | \$ - | \$ - | \$ - | \$ - | \$ - | 0.00% |
| Series 2021C | \$ 122,000 | \$ 29,822 | \$ - | \$ - | \$ - | \$ 29,822 | 24.44% |
| MIP | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | n.a. |
| Oper. Reserve Fund | \$ 85,800 | \$ 21,450 | \$ - | \$ - | \$ - | \$ 21,450 | 25.00% |
| Subtotal - Capital = | \$ 4,397,100 | \$ 1,181,807 | \$ - | \$ - | \$ - | \$ 1,181,807 | 26.88% |
| Total = | \$ 20,537,900 | \$ 5,722,864 | \$ 6,000 | \$ - | \$ - | \$ 5,728,864 | 27.89% |
| Customer Revenues | | | | | | | |
| Taxes Collected | | \$ 133,033 | \$ - | \$ - | \$ - | \$ 133,033 | n.a. |
| Taxes Paid | | \$ 92,081 | \$ - | \$ - | \$ - | \$ 92,081 | n.a. |
| Interest & Misc Revenue | \$ 50,600 | \$ 35,408 | \$ - | \$ - | \$ - | \$ 35,408 | 69.98% |
| Penalty Revenues/Credits | | \$ 21,733 | \$ - | \$ - | \$ - | \$ 21,733 | n.a. |
| Energy Revenues Collected | \$ 20,113,000 | \$ 5,639,947 | \$ - | \$ - | \$ - | \$ 5,639,947 | 28.04% |
| Revenues = | \$ 20,163,600 | \$ 5,738,040 | \$ - | \$ - | \$ - | \$ 5,738,040 | 28.46% |
| Metro Funding Amount = | \$ 374,300 | \$ (15,176) | \$ 6,000 | \$ - | \$ - | \$ (9,176) | -2.45% |

The DES serves 21 customers and 42 buildings in downtown Nashville. These customers are divided into three categories: 1) Privately-owned buildings, 2) State of TN-owned buildings and 3) Metro-owned buildings. The New Customers listed in Table 4 are non-Initial System private customers. A summary of the annual costs for each of these three categories is presented in Table 4. These values include late fees and penalties and any unpaid balances.

Table 4. Customer Revenue Summary to Date

| Building | Chilled Water | | | Steam | | |
|-------------------|---------------------|-------------------------|----------------------|---------------------|----------------------|--------------------|
| | Total Cost | Consumption (tonhrs/yr) | Unit Cost (\$/tonhr) | Total Cost | Consumption (Mlb/yr) | Unit Cost (\$/Mlb) |
| Private Customers | \$ 1,551,872 | 9,505,225 | \$ 0.1633 | \$ 350,309 | 11,083 | \$ 31.6076 |
| State Government | \$ 1,095,998 | 5,469,091 | \$ 0.2004 | \$ 455,837 | 13,469 | \$ 33.8433 |
| Metro Government | \$ 1,704,063 | 10,548,906 | \$ 0.1615 | \$ 481,869 | 20,457 | \$ 23.5554 |
| New Customers | \$ 1,080,027 | 6,265,559 | \$ 0.1724 | \$ 323,456 | 14,414 | \$ 22.4400 |
| Total | \$ 4,351,933 | 25,523,222 | \$ 0.1705 | \$ 1,288,014 | 45,009 | \$ 28.6169 |

Total Revenue \$ 5,639,947
 True-up and Adjustments (Net) \$ 98,094
 Net Revenue \$ 5,738,040

III. EGF Operations

Items relating to the facility operations presented herein are derived from the monthly reports issued by CES for FY23. TEG and CES continue to meet monthly and regularly communicate about important issues and on-going projects. CES has reported and managed EGF operations satisfactorily; however, they have failed to meet all of the new performance guarantees in Amendment 2 for twenty-seven consecutive months.

A. Reliability

The principal issues surrounding the reliable operation of the EGF relates to the ability to operate without significant interruption, exclusive of planned outages, and disruption of service to the customers. The following disruptions in service occurred during the quarter.

-) A steam outage occurred in August in order to replace two valves on de-aerator 1. The steam pressure was below 150 psig for six hours and fifteen minutes.
-) The chilled water temperature exceeded 43.3°F for approximately thirty-six minutes on September 3 while starting two additional chillers.
-) A boiler feed water pump began cavitation on September 18 causing boiler 3 to trip. Two additional feed water pumps were started. After which, boiler 3 would not restart, so boiler 1 was started in its place. This trip resulted in the steam pressure being below 150 psig for approximately ninety minutes with a low pressure of 138 psig.
-) There were no other reported issues during the quarter.

B. Efficiency

The operation of the EGF did not satisfy all of the guaranteed levels for all commodity usage during the quarter. There were excursions above the guaranteed levels for the current quarter. A more detailed discussion of the contract guarantee performance was presented previously in this report.

C. Environment, Health, and Safety

No environmental violations were reported during the quarter.

CES has implemented and is requiring regular attendance for online safety courses for their employees. Masks are to be worn within the EGF and when social distancing cannot be implemented.

D. Personnel

As of the end of the quarter, CES is currently staffed with nineteen full time employees, one remote part-time employee and two shared employees. The new General Manager, Mike Winters, began work during the quarter. CES has also hired a replacement electrician who likewise started work during the quarter. Of the current number of employees, thirteen were previously employed by Nashville Thermal Transfer Corporation.

E. Training

Staff training for this quarter consisted of the Health and Safety training discussed previously.

F. Water Treatment

The water treatment program consists of regular testing and monitoring of the water chemistry in the steam, chilled water, and condensing water systems. Chemicals are added to control the water hardness, chlorine levels and biologicals and to aid in the prevention of corrosion. Remote testing of the condensate at the AA Birch, Tennessee Tower and the Andrew Jackson also occurs regularly to monitor the concentration and distribution of the steam system chemicals.

) Steam System

- The condensate return averaged approximately 72.5% of the steam sendout during the quarter, which represents a 9.9% decrease over the previous First Quarter. A portion of the condensate was dumped during the quarter due to hardness or iron from customer buildings.
- Feedwater iron, pH, and hardness (for the portion of the condensate returned) remained within their acceptable ranges during the quarter.

) Condensing Water System

- The conductivity of the condensing water continues to be normal with only a few excursions.
- The cooling tower blowdown increased 2.9% over the previous First Quarter. This increase resulted in an average increase in the cycles of concentration in the cooling towers by 5.5%.

) Chilled Water System

- o CES continues to monitor and test for the presence of bacteria in the system. The biological growth in the system, as measured at the EGF and at the customer buildings, has become essentially non-existent. Chem-Aqua's proprietary biological treatment system continues to function properly.
- o Metro approved the installation of the side stream filter at the EGF. Installation is currently scheduled for the Second Quarter FY22 under project number DES200.

G. Maintenance and EGF Repairs

CES continues to report on the routine and preventative maintenance activities performed on the EGF primary and ancillary equipment. The principal items are discussed herein as they relate to the repair, maintenance or replacement of equipment or devices at the facility and are not considered extraordinary. The cost for these items is included as part of the FOCs.

-) Cleared debris around exterior of EGF;
 -) Checked, updated, backed-up and repaired plant computers and servers;
 -) Checked and adjusted packing on all pumps;
 -) Repaired plant lighting and electrical;
 -) Repaired leak on softener 2 and 3;
 -) Condensing water pump 4 motor failed and was sent out for repairs;
 -) Chilled water pump 4 variable frequency drive failed;
 -) The motor bearing failed on boiler feed water pump 3 and was sent out for repairs;
 -) Condensate pump 3 motor failed and was sent out for repairs;
 -) Replaced evaporator actuator for chiller 5;
 -) Trane replaced the purge unit on chiller 5B and the control panel on chiller 9B;
 -) Replaced two valves on de-aerator 1;
 -) Replaced cooling tower 16 fan belt;
 -) Repaired cooling tower makeup valve;
 -) Re-piped condensate pump 5 drain;
 -) Repaired leak on 31905 chemical line;
 -) Adjusted fan belts on cooling towers 4, 7, and 15;
 -) Repaired sprinkler system;
 -) Replaced drain line on boiler feed water pump 4;
 -) Repaired actuator on chiller 4 condenser inlet valve;
-

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-) Other repairs, maintenance and preventative maintenance were made during the quarter and are listed in the monthly reports issued by CES.

H. EGF Walkthrough

The EGF Walkthrough was conducted on September 27, 2022, by Kevin L. Jacobs, P.E. Based on the review of the EGF, the following comments and observations are presented. CES made significant efforts within the past year to address many of the issues contained in the previous reports; however, some items remain which are noted herein.

-) CES has reported in the previous quarters that the riser tubes in all of the cooling towers had been painted and that the cooling tower fill had all been replaced. Rust spots on the riser tubes remained present in the Fourth Quarter FY19 Walkthrough and continued to worsen. CES applied a new coating on the riser tubes to most of the cooling towers. **CES stated that only a few more of the cooling towers require the new coating and that they would be addressed after the cooling season.**
-) The louvers and portions of the fill at cooling towers 1, 6 and 15 appear to have been damaged. As noted in the First Quarter FY22 Walkthrough, no additional work appears to have been completed since this item was noted in the Third Quarter FY20 Walkthrough. The damaged portions need to be repaired or replaced. In addition, the sections of the louvers on towers 5 and 6 appear to have separated in several places. **CES stated they may request an updated quote from their contractor to address this issue during the Second Quarter FY22.**
-) As reported in previous Walkthrough Reports, the algae growing on the cooling tower deck appeared dead but needed to be removed. During this Walkthrough, the majority of the dead algae had been removed. No living algae was noted on the cooling tower deck. **CES cleaned the cooling tower deck during the quarter. This item will be removed from future reports.**
-) Chemical feed lines were noted as leaking with visible salt build-up on some of the lines between the tanks labeled 12900 and 10600 and tanks 12001 and 34170. This item was first noted in the Second Quarter FY22 Walkthrough report. **CES cleaned the area between the tanks but has not repaired the leaking joints.**
-) De-aerator 2 was open during the Fourth Quarter FY22 Walkthrough. The steam valve was closed but some condensate appeared to be leaking through and dripping from the nozzles. **CES has addressed this issue. This item will be removed from future reports.**
-) Older computer equipment is being stored in the electric room. Noted in previous Walkthrough reports, if the older computer equipment is not intended to be used or is “junk”, it needs to be removed. Some empty cardboard boxes were also noted. These should also be removed. **CES has removed the old computer equipment from the electric room. This item will be removed from future reports.**
-) An overhead lamp was not working properly at the south end of the expansion tank catwalk. During the Fourth Quarter FY22 Walkthrough, an additional lamp was not

working above chilled water pump 5. **CES has repaired the lamps. This item will be removed from future reports.**

-) The CHWS sign on the 42” chilled water piping at the wall had a broken tie and was hanging down. The insulation of the piping adjacent to this sign was also stained. **CES has made the necessary repairs. This item will be removed from future reports.**
-) The old monitors, controls equipment, electrical components, starters, etc., that are being stored in the electrical room need to be removed if they are not intended as spare parts. **CES has removed this equipment. This item will be removed from future reports.**
-) Other action items previously noted to be addressed by CES have been completed. (See also the “Quarterly EGF Walkthrough Report,” dated September 27, 2022, by TEG for additional information.)

IV. Capital Projects

The Capital Projects discussed in this section are those projects funded through the issuance of bonds by Metro. Costs for these projects will be paid from funds already appropriated. The status of the projects is discussed, and the project cost-to-date and bond balances are also presented.

A. First Quarter FY23 Open Projects

The following projects remained open at the end of the First Quarter FY23.

1. DES133.1 – Old Convention Center Site Redevelopment: Monitoring of Broadway Tunnel

This project involved the monitoring/reporting on the condition of the Broadway Tunnel related to the construction and blasting at the 5th + Broadway Development. Metro is pursuing reimbursement from the contractor(s) responsible for the blasting and subsequent damage to the tunnel through legal means. This project has been closed as a DES project and transferred to Metro Legal. This project will be removed from future reports.

2. DES139 – DES Options Review

TEG, the Metro Liaison, and Metro Water Services (MWS) discussed the Business and Marketing Plans proposed by TEG in FY21. The draft of these documents remain under review by MWS, but TEG is working under this project number to address the questions and comments raised by MWS during this meeting and is preparing other documentation that presents recommendations for the DES moving into the future while remaining under Metro ownership. No additional work was requested by Metro during the quarter.

3. DES154 – Manhole K Repairs

This project is in close-out.

4. DES143/161 – Manhole N1, N2 and S6 Insulation

This project addresses the installation of insulation in three (3) manholes: Manhole N1, Manhole N2 and Manhole S6. Manhole N1 and N2 house chilled water piping which is partially uninsulated. Manhole S6 is a small manhole that is a part of the State distribution system which houses steam and condensate return piping which is uninsulated. These projects address the insulation of this uninsulated piping.

Manhole S6 (DES-161) is closed.

The steel cleaning/coating in Manhole N1 was completed during the First Quarter of FY23. CES has decided to include the insulation in Manhole N1 under their Amendment 2 obligations. CES is considering including the insulation work in Manhole N2 in their Amendment 2 obligations. It is anticipated that the insulation work in both these manholes will be completed during the Second Quarter FY23.

5. DES163 – New Service to MDHA Parcel K (Peabody Union)

The Peabody Union development includes the construction of Guthrie St that will require the modification to the east retaining wall along the EGF property. The installation of this new road may affect the entrance and exit to the EGF site and result in the loss of DES property. Unfortunately, they have elected to not be a DES customer. This project number will be used to track costs and activities associated with the new road, the on-site construction activities, and their impact to DES.

Site work began during the Fourth Quarter FY21 which included earth moving and rock removal. Blasting began in July. TEG hired VibraTech to install their seismic monitors at five locations at the EGF. CES, VibraTech and TEG regularly monitor and review the facility and operation of the DES to ensure no damage or operational issues occur or have occurred. Should any issues arise, CES will promptly address the issues and report their findings to TEG and Metro immediately.

6. DES177 – Manhole B1 Ladder and Platform

Manhole B1 is in 1st Ave South and houses a groundwater sump pump to alleviate the amount of groundwater that infiltrates into Manhole B. Manhole B1 is a 4 ft diameter, precast manhole with individual embedded rung access ladder. Currently, personnel stand on partially submerged concrete blocks when maintenance is required within this manhole. This project addresses the installation of a platform and ladder for maintenance.

This project was bid and verbally awarded during the Fourth Quarter FY21. There is a dispute between CES and DES regarding scope items that CES is requesting additional compensation to perform this work, therefore this project is on hold until the matter is resolved.

7. DES178 – Manhole 5 Repairs

Manhole 5 has several structural steel piping supports which are corroded and need to be cleaned and coated. This project addresses the cleaning and coating of these components and the replacement of damaged and missing piping insulation.

The cleaning and coating of the structural steel has been completed and reviewed by TEG. The insulation has been priced and is about to be awarded. It is anticipated that this work will begin and be completed during the Second Quarter FY23.

8. DES180 – State Tunnel Pipe Support Repairs

The State Tunnel has several steel piping supports which are corroded and need to be cleaned and coated. This project addresses the cleaning and coating of these components. The primary cause of this corrosion is water infiltration into the tunnel, and it would be prudent for the State to make repairs to the tunnel structure to address the water infiltration before the steel piping supports are cleaned and coated. TEG has spoken with the State and transmitted photos outlining the existing conditions and damage. TEG and CES met with the State and their structural engineer and conducted a walk-through of the tunnel on March 3, 2022. Based on a conference call with the State, they are approaching the needed repairs in two phases: Short-Term Repairs and Long-Term Repairs. Their engineer recently revisited the tunnel system to better define the entire scope of repairs and will present a report with their recommendations and an estimated budget to the State in November 2022. The State will then determine which repairs will be completed short-term, and which long-term. The State has indicated that the interior waterproofing of the tunnel will be addressed in the short-term.

TEG has compiled a scope outline of the most severely corroded supports to be cleaned and coated and CES has obtained pricing and presented a proposal to TEG for this scope. The intent is to have these supports addressed prior to the State initiating the interior waterproofing of the tunnel. However, CES has included statements in their proposal to retain the right to ask for additional mark-up on this work. The inclusion of this proposal statement is being disputed by TEG and Metro legal is reviewing the situation. The project's initiation and completion of the most severely corroded supports will be dictated by the outcome of this dispute. The completion of the cleaning and coating of the remaining supports will be dictated by the State's schedule/repair plan.

9. DES188 - 4th and Church Access Tunnel Repairs

This project is closed.

10. DES194 – Manhole B4 Repairs

The structural steel pipe supports within Manhole B4 are corroded and require cleaning and coating. In addition, most of the insulation within Manhole B4 needs replacement and the entry ladder needs to be extended. This project addresses these needs.

TEG completed construction documents for this work during the Third Quarter FY22. It is anticipated that CES will obtain a quotation for this work, and work will begin during the Second Quarter FY23.

11. DES195 – DES Parking Area

With the addition of Guthrie St adjacent to the east side of the DES property line (see DES163), the new road may impact the north and south ends of the DES property. This change will decrease the available parking area at the DES and also eliminate laydown areas used by CES and the DES contractors. Therefore, DES is investigating adding a parking area on the west side of the EGF that may be accessible from either Peabody St or Korean Veterans Blvd and could include a new doorway access to the expansion yard. Options were presented by a civil engineering firm hired by TEG. These options have been reviewed and discussed with Metro, but no decision has been made due to remaining uncertainties regarding the final layout of Guthrie St and the Peabody Union site.

12. DES196 – Exploratory Excavation and Condensate Leak Repair at MH 9

CES has identified condensate entering the condensate pipe wall penetration in MH 9. TEG is evaluating the scope of repairs needed.

13. DES197 – Manhole 3 Coatings and Repairs

This project is now in close-out.

14. DES198 – Manhole 18 Condensate Pump Replacement

With TEG's evaluation and preliminary drawings, CES was released in the Fourth Quarter FY22 to purchase the replacement pumps due to the long delivery schedule. The pumps arrived during the quarter, however, the variable frequency drives did not. CES's controls contractor also evaluated the control aspects of the design to ensure there were no additional long-lead items. Bid and construction are anticipated in the Second Quarter FY23 to coincide with the delivery of the drives.

15. DES199 – Manhole D3 Sparge Tube Addition

The bottom of an existing pipe stanchion is severely corroded rendering the support ineffective. Due to the absence of this support, when a nearby trap discharges, the condensate piping shakes due to steam hammer. This project addresses the replacement of the support and the installation of a sparge tube to address any steam hammering.

The structural work was completed and reviewed by TEG during the First Quarter FY23, however the support was not installed in the position designated by the drawings. TEG is reviewing the possible modification of the support.

16. DES200 – Chilled Water Side Stream Filter

The side stream filter is anticipated to be delivered during the Second Quarter FY23 with the construction and installation scheduled soon thereafter. The filter is expected to be operational by the Third Quarter FY23.

Since the filter will be considered part of the chemical treatment system, the DES customers will be charged for its capital cost over the course of approximately five (5) years once the filter becomes operational.

17. DES201 – East Bank Development

TEG, the DES Metro Liaison, and Metro's other engineering consultant, FVB, have been involved during the quarter with meetings and investigations into the developments on the East Bank. These developments include the possible construction of the new stadium for the Tennessee Titans, the development of the Oracle campus on River North, and the other potential commercial and residential developments in the area which could benefit from district energy. FVB is also working on a high-level report of the potential for development in the area. The options for district energy on the East Bank include the development of one or more new sustainable plants serving multiple customers.

18. DES203 – 7th and Commerce Hotel

TEG has remained in contact with the engineers and development team for a proposed hotel, restaurant, and retail spaces at 7th Ave N and Commerce St. The design of the new site is progressing with the intention of utilizing the services from DES. The estimated loads are 700 tons of chilled water and 11,000 pph of steam.

19. DES203 – Printers and Bankers Alley Building

TEG has remained in contact with the engineers and development team for a new multi-story residential and retail development located on 3rd Ave N at Printer's and

Banker's Alley. The design of the new site is progressing with the intention of utilizing chilled water from DES with an estimated load of 600 tons.

20. DES204 – New Signs for the EGF

Due to the age of the existing signage at the EGF, TEG investigated the possibility of replacing the building signs with more modern and electrified signage. CES has been directed to contract with a sign company to provide and install signs previously approved by Metro and TEG. CES ordered the new signs, and they are scheduled to be installed in the Second Quarter FY23.

B. First Quarter FY23 Closed Projects

DES133.1, DES179, and DES188 were closed during the First Quarter FY23. DES154, DES185 and DES197 are in close-out.

C. Capital Projects Budget

The following table summarizes the costs and remaining balance of the DES capital projects based on reported expenditures to date. Open projects or completed projects that require some additional management efforts are shown. Projects discussed in this report that are not listed did not have any expenses during the quarter. Total costs for projects that are closed are shown with a gray highlight. Only the funds currently available are shown.

Table 5. Capital Projects Expense Summary

| DES Project # | Description | Total Budget | FY22 Spending to Date | Total Spent to Date | Remaining Balance |
|-------------------|---|---------------------|-----------------------|---------------------|---------------------|
| Fund-49116 | | | | | |
| DES133.1 | NCC Blasting Issue | \$ 200,000 | \$ - | \$ 166,017 | \$ 33,983 |
| DES139 | Options Review | \$ 450,000 | \$ 849 | \$ 319,289 | \$ 130,711 |
| DES143 | MH N1, N2 and S6 Insulation | \$ 30,000 | \$ 716 | \$ 7,265 | \$ 22,735 |
| DES154 | MH K Repairs | \$ 75,085 | \$ 49 | \$ 35,736 | \$ 39,349 |
| DES163 | Parcel K Service | \$ 1,018,802 | \$ 21,386 | \$ 46,743 | \$ 972,059 |
| DES177 | MHB1 Ladder & Platform | \$ 45,500 | \$ - | \$ 6,833 | \$ 38,667 |
| DES178 | MH-5 Repairs | \$ 97,500 | \$ - | \$ 31,653 | \$ 65,847 |
| DES179 | MH-11 Repairs | \$ 76,500 | \$ 12,592 | \$ 75,542 | \$ 958 |
| DES180 | State Tunnel Support Repairs | \$ 140,000 | \$ 3,443 | \$ 6,727 | \$ 133,273 |
| DES188 | 4th and Church Access Tunnel Repairs | \$ 180,000 | \$ 3 | \$ 177,045 | \$ 2,955 |
| DES189 | MH4 Structural Steel and Insulation Repairs | \$ 56,750 | \$ - | \$ 13,960 | \$ 42,790 |
| DES191 | MH 20 Repairs | \$ 94,875 | \$ 40,057 | \$ 68,766 | \$ 26,109 |
| DES192 | Peabody Developments | \$ 40,000 | \$ 1 | \$ 28,689 | \$ 11,311 |
| DES193 | MH-13 Repairs | \$ 30,000 | \$ - | \$ 6,673 | \$ 23,327 |
| DES194 | MH-B4 Repairs | \$ 80,000 | \$ 49 | \$ 7,474 | \$ 72,526 |
| DES195 | DES Parking Lot | \$ 275,000 | \$ 7,086 | \$ 12,447 | \$ 262,553 |
| DES196 | Condensate Line Leak Repair at MH9 | \$ 130,000 | \$ 395 | \$ 448 | \$ 129,552 |
| DES197 | MH3 Coatings and Repairs | \$ 13,500 | \$ - | \$ 9,888 | \$ 3,612 |
| DES198 | MH18 Condensate Return Pump Replacement | \$ 175,000 | \$ 1,012 | \$ 9,688 | \$ 165,312 |
| DES199 | MHD3 Sparge Tube | \$ 25,000 | \$ 922 | \$ 1,608 | \$ 23,392 |
| DES200 | Sidestream Filter | \$ 330,000 | \$ - | \$ 1,430 | \$ 328,570 |
| DES201 | East Bank and Oracle Development | \$ 110,000 | \$ 10,394 | \$ 15,686 | \$ 94,314 |
| DES202 | Service to 7th and Commerce | \$ 1,630,000 | \$ 421 | \$ 758 | \$ 1,629,242 |
| DES203 | Service to Printer's Alley Residential | \$ 850,000 | \$ 48 | \$ 144 | \$ 849,856 |
| DES204 | DES Sign Replacement | \$ 73,000 | \$ 27,544 | \$ 27,544 | \$ 45,456 |
| | Total Closed Projects | \$ 3,698,579 | \$ - | \$3,698,579 | \$ - |
| | Metro Project Admin | \$ - | \$ - | \$ - | \$ - |
| | Project Man, Development, etc | \$ 16,074,909 | \$ - | \$ - | \$ 16,074,909 |
| | Fund Total | \$26,000,000 | \$ 126,968 | \$4,776,632 | \$21,223,368 |

V. Energy Distribution System Repairs, Improvements, PM, and Emergencies

Several EDS repairs and improvements were made during the First Quarter. The principal items for discussion are presented in the following sections.

A. Repairs and Improvements

Several repairs were made to the EDS and at customer buildings during the quarter. The remaining value of the R&I account to date is \$330,736. Table 6 provides a summary of the FY23 expenditures and revenues to date associated with the R&I budget.

Table 6. FY22 Repair and Improvement Expenditure and Revenue Summary

| Description | Date | Tracking # | Vendor | Expenditure | Transfers | Net Market Adjustment | Market Value | Balance |
|---------------------------------|-----------|------------|--------|---------------------|----------------------|-----------------------|----------------------|----------------------|
| Value at end of FY22 | | | | \$ 88,215.28 | | \$ - | \$ 254,534.91 | \$ 254,534.91 |
| July 2022 EDS R&I | 8/17/2022 | | CES | \$ 12,814.77 | | | | |
| Interest | 7/1/2022 | - | - | \$ 115.92 | | | | |
| Interest | 7/1/2022 | - | - | \$ (115.92) | | | | |
| Interest | 8/1/2022 | - | - | \$ 232.10 | | | | |
| Interest | 8/1/2022 | - | - | \$ (232.10) | | | | |
| Aug 2022 EDS R&I | 9/21/2022 | - | CES | \$ 8,376.70 | | | | |
| Interest | 9/1/2022 | - | - | \$ 465.76 | | | | |
| Interest | 9/1/2022 | - | - | \$ (465.76) | | | | |
| Sept 2022 EDS R&I | 10/19/22 | - | CES | \$ 3,840.65 | | | | |
| Sub-Total First Quarter | | | | \$ 25,032.12 | \$ 75,924.99 | \$ - | \$ 50,892.87 | \$ 305,427.78 |
| Sub-Total Second Quarter | | | | \$ - | \$ 25,308.33 | \$ - | \$ 25,308.33 | \$ 330,736.11 |
| Sub-Total Third Quarter | | | | \$ - | \$ - | \$ - | \$ - | \$ 330,736.11 |
| Sub-Total Fourth Quarter | | | | \$ - | \$ - | \$ - | \$ - | \$ 330,736.11 |
| FY23 Year to Date | | | | \$ 25,032.12 | \$ 101,233.32 | \$ - | \$ 330,736.11 | \$ 330,736.11 |

B. Preventive Maintenance

Preventive maintenance, tunnel and manhole inspections and reviews of customers' mechanical rooms were performed during the quarter. The principal items for discussion are presented.

1. EDS Manhole/Tunnel Inspections
 - a. The monthly vault/tunnel reviews were conducted as scheduled.
 - b. The number of vaults that required pumping this quarter decreased due to the lack of rain.
 - c. CES continues to replace trap assemblies within the EDS as needed.
 - d. CES should continue to clean areas of minor corrosion and then paint those areas with a cold galvanizing paint. If maintained, this should help reduce/slow down the progression of some areas of corrosion.
 - e. Minor insulation repairs are needed in some vaults.
2. Customer metering station calibration checks were completed as scheduled.
3. Water chemistry samples at customer buildings were taken as scheduled.
4. Other EDS items are included in the CES monthly reports.

C. Emergencies

There were no emergencies reported during the quarter.

D. EDS Walkthrough

The First Quarter FY23 walkthrough was conducted on October 5 and 6, 2022. The manholes that were visited included Manholes 2, 3, 4, 5, 6, 6A, 9, 10, 11, 12, 13, 20, D and D1. The following comments and observations are a result of these visits.

Many of the manholes reviewed this quarter have steel piping supports which have been part of our ongoing effort to remediate, repair and prevent corrosion and have recently been cleaned and coated as a part of this effort. The coating appears to be performing well and it is important that these supports be monitored closely by CES, and any degradation observed be immediately repaired and reported to TEG. This should result in instances of corrosion being addressed quickly and at minimal cost to Metro.

There is an action item list included at the end of this report.

1. Manhole 2

- a. There was not any water in this manhole, so it did not require pumping before entry.
 - b. There was a minor amount of mud in this manhole. An in-flow protector was purchased and installed last year in an attempt to minimize the mud infiltration. The protector was stainless steel, but the gasket failed and the “pull handle” broke making it difficult to remove. Therefore, the protector was removed from service. CES should remove the mud as soon as possible.
 - c. A concrete patching material was applied to several small areas on the walls and ceiling in September 2013. Some of these patches are beginning to experience some flaking. CES personnel should monitor these patched areas and notify TEG as the deterioration progresses.
 - d. The steam end can at the western wall penetration is corroded and deteriorating. There has not been any groundwater infiltration at this penetration. CES should monitor this end can and report any groundwater infiltration or other problems to TEG. TEG has developed a repair and will prioritize this with other EDS projects.
 - e. The steam and condensate return piping originally passed through this vault and had service lines going to the Washington Square area. Several years ago, the piping east of this vault (and Manhole 1) was abandoned and both the steam and condensate return piping through the east wall was capped. The service lines to Washington Square are also capped. These capped penetrations (wall sleeve and link seals) are deteriorating, and it is likely that groundwater will start seeping through them at some point. These penetrations should be sealed with concrete. TEG will prioritize this with other EDS projects. Meanwhile, CES should continue to monitor these penetrations and report any changes to TEG.
-

2. Manhole 3

- a. There was water in this manhole, and it required pumping before entry. Since Nashville has not received any rain in several weeks prior to this site review, TEG contacted Water Service to inform them of the presence of water and suggested that there might be a city water leak in the vicinity.
- b. There are some hairline cracks in the concrete walls; one is above the condensate penetration on the east wall; the other is above the steam penetration on the west wall. Pictures from prior reviews indicate that these cracks have not progressed. CES should continue to monitor these cracks and report any significant changes to TEG.
- c. Several months ago, CES replaced the pipe insulation in this manhole and just recently new insulation blankets were installed. One insulation blanket was incorrectly measured and had to be re-ordered and is expected to arrive and be installed within the next few weeks. CES should monitor the insulation and make repairs as needed.
- d. The steel piping supports, and entry ladder were also cleaned and coated within the last several months. CES should monitor and clean and re-paint these supports as needed.

3. Manhole 4

- a. There was water in this manhole, and it required pumping before entry. Since Nashville has not received any rain in several weeks prior to this site review, TEG contacted Water Service to inform them of the presence of water and suggested that there might be a city water leak in the vicinity.
- b. The steel piping supports, and entry ladder were also cleaned and coated within the last several months. CES should monitor and clean and re-paint these supports as needed.
- c. Several months ago, CES replaced the pipe insulation in this manhole and just recently new insulation blankets were installed. CES should monitor the insulation and make repairs as needed.
- d. The entry manway lid and frame were recently replaced. CES should continue to monitor these frames/lids and replace them as needed.
- e. The abandoned condensate return piping from Manhole 4 to 401 Union is stubbed into Manhole 4 and is open ended. Steam is wafting into Manhole 4 through the abandoned trap piping presumably from groundwater contacting the steam service line to 401 Union St. CES should either weld a cap on this pipe or plug the pipe with a wooden plug to prevent the wafting steam from entering the manhole.

4. Manhole 5

- a. There was not any water in this manhole, so it did not require pumping before entry.
- b. There are some insulation repairs that are needed in this manhole including the replacement of insulation blanket(s). The dripleg insulation is absent due to repairs to a pin hole leak on the trap piping connection. There is a project for the insulation replacement/repair (DES-178) which CES has received

- bids. CES should proceed with the needed insulation repair/replacement work.
- c. DES-178 also included the cleaning and coating of the structural steel pipe supports within this manhole. This work has been accomplished. CES should monitor and clean and re-paint these supports as needed.
5. Manhole 6
- a. There was water in this manhole, and it required pumping before entry. Since Nashville has not received any rain in several weeks prior to this site review, TEG contacted Water Service to inform them of the presence of water and suggested that there might be a city water leak in the vicinity.
- b. There is a minor amount of mud in the floor of the manhole which should be removed by CES personnel.
- c. Holes and cracks in the concrete surfaces in this manhole were repaired during a past project. CES should monitor these repairs and report any deterioration to TEG.
- d. The structural pipe supports were cleaned and painted in the fall of 2018. Some of the structures are presenting “creep” (the migration of rust stains from concealed surfaces that could not be exposed, cleaned, and painted). Other portions of the steel has some active corrosion. CES should wire brush/wheel/clean these areas of corrosion and paint them with cold galvanizing paint as soon as possible.
- e. Because some of the steel surfaces do not show signs of corrosion, CES should obtain a quotation from Enecon with two options:
- (1) Clean and coat the active corrosion areas on the structural steel within the manhole.
- (2) Clean and coat all structural steel within the manhole. (Depending upon the price difference, it may be prudent to have all the steel cleaned and coated.) Please present these quotations to TEG for review before any work takes place. **This item appeared on last year’s report.**
- f. The condensate piping valve is underneath the ventilation manway; therefore, surface water falls on this valve. The yoke of the valve has delaminated due to corrosion caused by this water infiltration. If this valve is necessary, it should be replaced. If it is replaced, this valve should be relocated to avoid being underneath the ventilation manway. TEG will discuss with CES the need for this valve, and if it is needed, check the piping stresses with to relocate the replacement valve.
6. Manhole 6A
- a. There are two separate manholes at the Hermitage Hotel service lines; one houses the chilled water service line isolation valves, the other house the steam and condensate return service isolation valves. Each of these manholes only have one manway which is a potential safety hazard for personnel entry/maintenance. If maintenance is required, the services are isolated at other locations in the system before entry. Both manholes have dirt floors and therefore the steam/condensate manhole is extremely hot and perpetually has secondary steaming; therefore, a thorough review without isolation of the
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services is not possible. Because the only serviceable equipment in these manholes are valves, if a leak were to develop it should be found during CES's monthly inspections and remedied quickly.

- b. CES should schedule an isolation of the steam/condensate manhole every 6 months in order to service these valves.
7. Manhole 9
- a. This manhole has an electric sump pump. But there was water in this manhole because the existing sump pump float/level control position will not allow the pump to remove all of the water. CES should investigate repositioning the float to allow the pump to remove all of the water in the manhole floor.
 - b. The structural pipe supports/anchors were cleaned and coated to eliminate corrosion. Additional steel angles were added at the eastern condensate piping wall penetration and there is with a minor amount of corrosion on these members. CES should clean this steel and paint it with cold galvanizing paint to prevent the propagation of the corrosion. CES should also obtain a quote from Enecon to clean and coat these angles and present it to TEG. CES should continue to monitor these structures and clean/paint as needed along with reporting any degradation to TEG.
 - c. The insulation in this manhole is in good condition. CES should monitor the insulation and report any degradation to TEG.
 - d. Water is infiltrating this manhole at the western condensate piping penetration. Because this infiltration is cyclic, it is believed that it originates from a hole in the buried condensate piping just west of the manhole. TEG is investigating the repair of this piping vs. the potential replacement for the piping back to Manhole 10.
 - e. Some cracking has occurred in the underside of the concrete opening which was cut into the northern wall of the "old" manhole. This crack was sealed by a contractor in early 2018. CES should monitor these sealed cracks and report any degradation to TEG.
 - f. The link seals around the city water line within this manhole seep a little water. CES has tried tightening the link seals to no avail. CES should direct Enecon to seal these link seals with the Enecon hydraulic cement product. **This item appeared on last year's report.**
8. Manhole 10
- a. There was some water present in this manhole which had to be swept into the sump for removal due to a low point in the manhole floor.
 - b. The condensate anchor was recently cleaned and coated. CES should monitor this anchor and report any degradation to TEG.
 - c. The southern steam and condensate return piping, piping penetrations and manhole wall was rebuilt under DES-185. CES should monitor these repairs and report any degradation to TEG.
 - d. A 90 degree elbow on the condensate return piping in this manhole was recently replaced due to thinning of the pipe wall. There is also a 45 degree condensate piping elbow at the western wall penetration that has thinning pipe wall that needs to be replaced. TEG is investigating the replacement of this
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elbow with the replacement of the piping between Manhole 9 and Manhole 10. These replacements may also be performed with needed condensate piping replacement at Manhole 11.

- e. There was a packing leak on the main condensate valve in this manhole. CES personnel tightened the packing and eliminated the leak during this review.
 - f. The condensate piping insulation needs to be repaired/replaced. CES should schedule this after the needed pipe replacements take place.
9. Manhole 11
- a. There was water in this manhole, and it required pumping before entry.
 - b. The structural pipe supports were recently cleaned and coated. CES should monitor these coatings and if necessary, make repairs.
 - c. Spalling of the manhole roof was repaired in 2018. CES should continue to monitor the ceiling and report any degradation of these repairs to TEG.
 - d. The wall penetration end cans were repaired/replaced under DES-179. CES should monitor these end cans, clean/paint as needed and report degradation to TEG.
 - e. The western condensate valve is located underneath the vent manway which allows surface water to enter the manhole. This has resulted in the corrosion of a condensate valve beneath this manway. Additionally, the condensate piping immediately west of this valve which passes through the western manhole wall is corroded and needs replacement. Unfortunately, this piping replacement will require the excavation of the western end of the manhole. TEG is investigating this piping replacement along with the needed piping replacement between Manhole 9 and Manhole 10 and will coordinate this effort with CES.
 - f. There are some hairline cracks in the manhole walls. CES should monitor these cracks and notify TEG of any significant changes.
 - g. There are some insulation/insulation blanket replacements needed within this manhole. These repairs should be done once the piping is replaced.
 - h. There is a fair amount of debris in the floor of this manhole which needs to be removed either by the contractor that performed work inside the manhole or by CES.
10. Manhole 12
- a. No water was present in this manhole.
 - b. Some areas on the structural steel coatings are beginning to fail. CES needs to clean these areas with a wire brush/wheel and paint them with cold galvanizing paint to deter propagation of the corrosion. Because some of the steel surfaces do not show signs of corrosion, CES should obtain a quotation from Enecon with two options:
 - (1) Clean and coat the active corrosion areas on the structural steel within the manhole including the ladder.
 - (2) Clean and coat all structural steel within the manhole including the ladder. (Depending upon the price difference, it may be prudent to have all the steel cleaned and coated.) Please present these quotations to TEG for review before any work takes place. **This item appeared on last year's report.**
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- c. The entry manway lid has a hole in it. The hole does not penetrate the lid completely. Because this lid is in a parking lane and not a traffic lane, rather than replacing the lid, the hole could possibly be filled with epoxy. CES should investigate filling the hole with epoxy. If this is unsuccessful, CES should replace this lid/frame.
 - d. CES should monitor the hairline cracks in the ceiling and report any significant changes to TEG for review/approval.
 - e. The grout under the northern base plate on the east end of the manhole has some small cracks. CES should monitor this and report any significant changes to TEG.
 - f. The trap was not functioning properly during the review. CES should repair/replace this trap as soon as possible.
 - g. The trap piping from the drip leg to the trap is not insulated. CES should have this piping insulated after the trap is repaired/replaced.
 - h. The dripleg is not insulated. CES should have this dripleg insulated after the trap is repaired/replaced.
11. Manhole 13
- a. No water was present in this manhole.
 - b. The condensate pipe stanchion support on the 6" condensate piping extending west out of the manhole was recently replaced with a hanger from the ceiling. The insulation and jacketing around the hanger lug connection to the pipe needs to be repaired along with the pipe insulation immediately east of this new hanger lug.
 - c. The steam piping at the western wall penetration includes an insulation blanket. This blanket has deteriorated. CES should have this blanket removed and investigate if this section of piping can be insulated with standard pipe insulation. If not, this insulation blanket should be replaced.
 - d. The existing trap piping was re-piped to include a strainer. The trap piping from the dripleg to the trap now needs to be insulated.
 - e. There is some water on the manhole floor beneath the chilled water valves at the western wall. This may be condensation which indicates that the chilled water valve should be reinsulated, or it could be groundwater seepage from the wall penetration. CES should remove the insulation at the western wall to determine the source of this moisture. If it is groundwater from the penetration, CES should have Enecon seal the penetration with their hydraulic grout/cement. If it is condensation, CES should have the chilled water valves reinsulated.
 - f. Some of the structural pipe support steel has some minor corrosion. Because some of the steel surfaces do not show signs of corrosion, CES should obtain a quotation from Enecon with two options:
 - (1) Clean and coat the active corrosion areas on the structural steel within the manhole.
 - (2) Clean and coat all structural steel within the manhole.
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(Depending upon the price difference, it may be prudent to have all the steel cleaned and coated.) Please present these quotations to TEG for review before any work takes place.

12. Manhole 20

- a. This manhole is located at the top of a vertical shaft which connects to the 7th Ave. Tunnel. It houses chilled water, steam and condensate return piping which serves the Hume Fogg High School. There is not any serviceable equipment (valves, traps, etc.) in this manhole. The manhole consists of a lower rectangular concrete vault with (2) manway openings in the concrete ceiling. Above these (2) manway openings are (2) separate precast round manholes. The Hume Fogg condensate return piping entering this manhole is badly corroded and leaking condensate. DES-191 is currently active which addresses this corroded piping along with other needs within this manhole.

13. Manhole D

- a. The coatings on the structural steel pipe supports within this manhole has failed. This failure is primarily due to the prior water infiltration into this manhole which contacted the steam piping and boiled. CES should obtain a quote from Enecon to clean and coat all of the structural steel in this manhole and present this quotation to TEG for review.
- b. There is some insulation missing on the condensate piping. This piping should be insulated.
- c. There is a plywood form board attached to the western wall where an abandoned pipe penetration was sealed with concrete. This form needs to be removed.
- d. An electric junction box (formerly part of the electrical disconnect) is badly corroded and needs to be replaced, if permissible with non-metallic boxes.

14. Manhole D1

- a. The manhole includes two steel electrical boxes that are corroded and should be replaced. CES should replace these boxes as soon as possible, if permissible with non-metallic boxes. **This item appeared on last year's report.**

ACTION ITEMS

CES:

1. Manhole 2
 - a. Monitor concrete patched areas and report degradation to TEG.
 - b. Monitor the east and southern wall abandoned piping penetrations and report any groundwater seepage to TEG.
 - c. Monitor the western steam penetration end can and report any groundwater seepage to TEG.
 - d. Clean the mud from this manhole.
2. Manhole 3
 - a. Monitor hairline concrete cracks above east and west piping wall penetrations and notify TEG of any significant changes.

- b. Monitor the steel piping supports and the entry ladder and clean/paint with cold galvanizing paint as needed.
 - c. Monitor the pipe insulation and make repairs as needed.
 - 3. Manhole 4
 - a. Monitor the steel piping supports and the entry ladder and clean/paint with cold galvanizing paint as needed.
 - b. Monitor the pipe insulation and make repairs as needed.
 - c. Cap or plug the abandoned condensate piping.
 - 4. Manhole 5
 - a. Monitor the steel piping supports and clean/paint with cold galvanizing paint as needed.
 - b. Make the needed insulation repairs as soon as possible.
 - 5. Manhole 6
 - a. Monitor concrete surface repairs and report any deterioration to TEG.
 - b. Clean/remove mud from manhole.
 - c. Clean/paint the active corrosion areas on the structural steel with cold galvanizing paint.
 - d. Obtain pricing from Enecon to:
 - (1) Clean/coat the active corrosion areas on the structural steel within the manhole.
 - (2) Clean/coat all the structural steel within the manhole.**This item appeared on last year's report.**
 - 6. Manhole 9
 - a. Investigate the sump pump float and make repairs/adjustments as needed.
 - b. Monitor structural steel supports and report any degradation to TEG.
 - c. Clean/paint the steel at the eastern condensate wall penetration.
 - d. Obtain pricing from Enecon to clean/coat the steel at the eastern condensate penetration.
 - e. Monitor the pipe insulation and report any degradation to TEG.
 - f. Monitor the sealed concrete cracks in the underside of the opening between the original manhole structure and the new manhole structure and report any changes to TEG.
 - g. Direct Enecon to seal the city water piping wall penetrations with the Enecon hydraulic cement. **This item appeared on last year's report.**
 - 7. Manhole 10
 - a. Monitor the condensate structural anchor and report any degradation to TEG.
 - b. Monitor the southern wall repairs and report any degradation to TEG.
 - c. Schedule piping insulation repairs/replacement after the piping repairs are made.
 - 8. Manhole 11
 - a. Monitor the hairline cracks in the concrete walls and report any significant changes to TEG.
 - b. Monitor the ceiling and report any degradation to TEG.
 - c. Monitor the structural steel coatings and make repairs as needed.
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- d. Monitor the piping penetration end cans, clean/paint as needed and report any degradation to TEG.
 - e. Make the needed insulation repairs once the needed piping repairs are made.
 - f. Clean the debris from the manhole.
9. Manhole 12
- a. Clean/paint the corroded areas of the steel supports with cold galvanizing paint.
 - b. Obtain a quote from Enecon to:
 - (1) Clean/coat the active corrosion areas on the structural steel within the manhole including the entry ladder.
 - (2) Clean/coat all structural steel within the manhole including the entry ladder.
 - c. Monitor the hairline cracks in the ceiling and report any significant changes to TEG.
 - d. Monitor the grout underneath the northern base plate on the eastern end of the manhole and report any significant changes to TEG.
 - e. Patch the hole in the manway entry lid with epoxy. If unsuccessful, replace the lid and/or lid/frame.
 - f. Repair/replace the trap ASAP.
 - g. Insulate the dripleg.
 - h. Repair/replace the insulation on the trap piping between the dripleg and the trap once the trap has been repaired/replaced.
10. Manhole 13
- a. Repair the disturbed insulation on the condensate piping.
 - b. Investigate insulating the steam piping at the western wall penetration in lieu of replacing the insulation blanket. If field insulation is not possible, replace the insulation blanket.
 - c. Insulate the trap piping from the dripleg to the trap.
 - d. Investigate the origin of the moisture underneath the chilled water valves by removing the insulation at the western wall penetration. If the moisture is groundwater seeping through the wall penetration, have Enecon seal the wall penetration with their hydraulic grout/cement. If the moisture is from condensation, have the chilled water valve(s) reinsulated and sealed.
 - e. Obtain a quote from Enecon to:
 - (1) Clean/coat the active corrosion areas on the structural steel within the manhole.
 - (2) Clean/coat all structural steel within the manhole.
11. Manhole 20
- a. None.
12. Manhole D
- a. Obtain a quote from Enecon to clean/coat all structural steel within the manhole.
 - b. Remove the wood form from the west wall.
13. Manhole D1
- a. Replace electrical boxes as soon as possible. **This item appeared on last year's report.**
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TEG:

1. Manhole 2
 - a. Prioritize the repair/replacement of the steam end can.
2. Manhole 3
 - a. None.
3. Manhole 4
 - a. None.
4. Manhole 5
 - a. None.
5. Manhole 6
 - a. Discuss with CES the need for the condensate valve and decide on a repair/replacement.
6. Manhole 9
 - a. None.
7. Manhole 10
 - a. Investigate the repair/replacement of the condensate piping between Manhole 9 and Manhole 10.
8. Manhole 11
 - a. Investigate the replacement of the condensate piping at the western wall penetration.
9. Manhole 12
 - a. None.
10. Manhole 13
 - a. None.
11. Manhole 20
 - a. None.
12. Manhole D
 - a. None.
13. Manhole D1
 - a. None.

VI. Customer Relations

This section contains descriptions of the marketing efforts made by the DES Team during the quarter and prominent existing customer interactions. The topics of interactions, meetings and training seminars with the customers are also discussed. There are currently 21 customers, comprised of 42 different buildings, connected to the EDS. Service to each of these buildings continues to prove satisfactory, and the responsiveness to customer issues is handled by CES in an expeditious and professional manner.

A. Marketing

The design and development of the proposed hotels at 1st Ave S and KVB have been delayed. However, TEG continued discussions with the development team for the site and will continue to work with them through their design options.

Metro Water Services (MWS) participates on the East Bank Technical Advisory Committee, which consists of more than two dozen representatives of interested utilities, regulatory bodies, planning agencies, property owners, and design professionals. DES is represented by the Metro Liaison who also represents the interests of MWS infrastructure. The Metro Liaison has been actively promoting the use of district energy in the East Bank planning process by identifying synergies with other utility, transportation, and public recreation agencies. Work associated with the East Bank Development is tracked under the project DES201.

MWS and DES are currently in discussions regarding the developing plans for the Oracle campus, but those plans have not been widely publicized. DES is also pursuing opportunities to serve other developments and MWS infrastructure in the River North area. DES continues to explore options for serving the Oracle campus, Nissan Stadium, and other East Bank developments in a sustainable way.

TEG has made efforts to contact the parties involved with a new development south of Peabody St in the Rolling Mill Hill area. This potential development could be served from new service lines along Peabody St (DES192).

TEG met with the development team for a new hotel to be located at Demonbruen and 8th Ave S during the quarter. The design and development are in the early stages and more conversations are anticipated in the coming months.

B. Customer Interaction

The CES customer service representative (CSR) continues to respond to customer issues as they arise. Much of the communication involves minor problems with the customers' heating and cooling systems that are unrelated to DES service. Other more significant issues are summarized herein.

-) Several customers made repairs within their buildings during the Quarter and requested assistance from CES, which was provided. Some of these repairs involved isolating the steam or chilled water services to the building for the customers.
-) After testing the State condensate loop for hardness, the War Memorial and Library and Archives building remained isolated from the system due to hardness until September. After subsequent repairs by the building personnel, the condensate from the Legislative Plaza building was acceptable and could be returned to the system if the condensate return from the War Memorial building.
-) The CSR contacted the facility manager at the Schermerhorn Symphony Center after noticing a higher than normal steam consumption in July. Upon investigation, the CSR determined the issue was related to the DES meter and had it repaired.
-) The CSR contacted several other buildings to discuss their higher than normal steam consumptions and requested they investigate their equipment.

-) TEG and personnel from the 4th and Church Building discussed their proposed building renovations and how they would benefit from remaining on the DES. At the time of this report, they have decided to remain as a DES customer after the building modifications are completed.
-) The CSR and TEG met with JKP personnel to review the electrical ground wire connected to the DES metering system. TEG contacted Penta Engineering (the contractor who installed the grounding wire) who agreed to relocate the wire(s) from the DES devices.
-) Other minor issues and customer interactions are noted in the monthly reports from CES.

VII. Recommendations

CES is obligated to meet the standard of good utility practice and performance guarantees as outlined by the ARMA. Based upon the operating data, CES continues to fail to meet several of the performance guarantees. The plan currently being developed by CES's engineer has been delayed but should be implemented in the Second Quarter. In TEG's opinion, CES needs to continue to improve the operations of the EGF to comply with the ARMA. CES has improved its EDS maintenance over the last several quarters, and there are fewer items which have been repeated in TEG's quarterly reviews. CES has likewise addressed many of the recurring issues in the EGF walkthrough reports and improved the overall condition, appearance, and operation of the EGF during the last few quarters. CES needs to expeditiously address any long-outstanding items.

Based on the review of the First Quarter FY23 EGF and EDS operations, the following recommendations are made.

-) CES needs to address the maintenance items included in the EGF and EDS Walkthrough sections of this report as soon as possible.
-) CES needs to increase their preventative maintenance program to decrease the number of equipment malfunctions and trips within the EGF or otherwise improve the operation of the system to prevent such frequent occurrences in the future.
-) CES needs to address their inability to meet the new performance guarantees for the EGF. Failure to meet the performance guarantees for twelve consecutive months may be considered an Event of Default according to Section 18.02 (B)(4) of the ARMA. CES has operated the EGF for twenty-seven consecutive months with at least one performance guarantee excursion each month.
-) The structural steel within vaults and tunnels that has been professionally cleaned and coated should be closely monitored so that if deterioration occurs, it can be addressed quickly and cost effectively.
-) Structural steel within the vaults and tunnels that have not been professionally cleaned and coated which exhibit evidence of corrosion should be cleaned and coated by CES using cold galvanizing paint to mitigate the progression of corrosion.

-) Insulation that is absent or in disrepair in the vaults and tunnels should be repaired/replaced through Amendment 2 of CES's contract or through capital and R&I projects.
-) Steam traps which need repair or replacement should be addressed immediately.
-) Expansion joint leaks should be repaired by either re-packing the joint or injection of a sealant once the leak(s) is sufficient for the repair to be effective.
-) CES should continue to remove debris and mud from manholes.