1. Refer to the Direct Testimony of Tracy Musgove (Musgove Testimony).

a. Provide a list, including case number and date, of utility commissions before which Ms. Musgove has testified to date.

b. Explain how the cited attendance at conferences qualifies Ms. Musgove as an expert in Rate Making Principles.

c. Explain how experience as a senior commercial lender for twenty years gives Ms. Musgove the knowledge to properly set rates for the retail and wholesale customers of Princeton.

d. Provide a detailed explanation of what caused Princeton's flushing to more than triple within the last five fiscal years.

e. Ms. Musgove states that the reason for the increase in the wholesale rate is due to her research and discovery that the retail rate payers are paying a different rate schedule than the wholesale customers. Explain how the retail customer costs would not warrant a different rate for the retail customers.

a. Response: Ms. Musgove has not previously testified before a utility commission.

b. and c. The purpose of Ms. Musgove's testimony is to provide information about PWWC and its proposed wholesale rate increase, including how and why PWWC determined its proposed rates. Evaluation of the adequacy of a utility's rates requires a basic understanding of accounting and financing, as well as the operations of utilities. Through her educational and employment background, Ms. Musgove garnered knowledge of accounting and financing. As a commercial lender, she was required to

understand complicated financial statements and lending terms, which translated well to understanding PWWC's financial statements and financing. The banking industry also requires a successful commercial lender to use analytical and decision-making skills to determine whether to recommend making a particular loan. Utility ratemaking also requires analytical and decision-making skills in setting fair, just, and reasonable rates.

As this Commission has recognized in its determination of certain elements of reasonable revenue requirements (such as the amount of employees' health-insurance expense that can be recoverable in rates), there is value in having a broad understanding of concepts outside the utility industry. The Commission has indicated that without a broader perspective, the utility industry will fall into a self-perpetuating cycle that leads to skewed results. Accordingly, Ms. Musgove's background in the banking industry helps bring perspective to her work for PWWC.

Ms. Musgove's experience as a former board member of PWWC and her role as Director of Finance provided her with PWWC-specific information that can assist in recommending appropriate rates. Attendance at seminars sponsored by the Kentucky Rural Water Association and the One World Summit provided her with a broader background to ensure that PWWC is operating in accordance with industry standards.

d. Please see PWWC's response to Item 23 of the Commission Staff's second request for information. As mentioned in that prior response and as the below data indicates, there are a number of reasons for the increased flushing. In 2014, there were only six auto flushers and three of the seven months where most of the flushing occurs had zero flushing activity. Between 2014 and 2015, there was an 88% increase

due to the timers on the auto flushers being increased and flushing occurred in April, May and October where it did not occur in 2014. These three months accounted for 76% of the difference. In 2016, the number of auto flushers were increased to seven to start the year and up to nine by August (a 50% increase in auto flushers).

Flushing increased by another 69% largely due to aiding CCWD with their DBP levels. While PWWC was asked to increase flushing to raise chlorine levels significantly above the minimum requirements, CCWD simultaneously decreased flushing from 4.6 million gallons as indicated on its annual PSC report for 2014 to 1.7 million gallons in 2016 and down to only 810,000 gallons in 2018. In 2017, three more auto flusher locations were added and by July, six were running at 6 hours per day at a volume of 135 – 284 gallons per minute. Flushing doubled in 2017 from 2016 levels and could be partially attributed to the continued DBP issues and ongoing complaints coming from CCWD. Levels in 2018 were actually 7% below the 2017 high even with PWWC handling problems with the chlorine equipment monitors at the plant and flushing more to remain in compliance. Finally, in 2019, the auto flushers were not turned on until July due to the Skyline Tank rehabilitation project and the finalizing of the line construction to the Industrial Park tank. Also, chlorine dioxide trials were ongoing and lessened the amounts required to maintain appropriate DBP levels through the summer and fall. Unfortunately, this trial had to be scrapped due to odor and quality issues with the water in certain areas of town and the flushing for summer of 2020 will more than likely increase unless CCWD takes responsibility for chlorine levels in their system.

Gallons Flushed By Month (000,s omitted)
2014 - 2019 Comparison
Auto Flushers and Hydrants Only

	April	May	June	July	Aug	Sept	Oct	Totals
2014	-	-	1,228	2,297	1,608	1,730	-	6,863
2015	377	2,083	2,070	2,070	2,113	2,040	2,127	12,879
2016	300	2,913	2,426	3,096	3,800	4,295	4,943	21,774
2017	838	4,746	5,320	13,894	8,866	6,129	4,939	44,731
2018	679	4,884	7,825	8,485	10,940	8,416	159	41,388
2019	-	-	206	3,917	5,235	5,823	4,238	19,420

e. PWWC's proposed wholesale rate does differ from its retail rates. A retail customer using 500 cubic feet per month would pay at least $19.52 or approximately $3.90 per 100 cubic feet. The proposed rate for wholesale customers is $2.97 per 100 cubic feet. PWWC's proposal recognizes that the cost to provide water service to a wholesale customer is similar to that of providing service to its largest retail customers. Other water utilities' rate schedules have similar attributes. For example, Kentucky-American Water Company's volumetric rate for its wholesale customers (sales to resale) is currently $4.236 per 1,000 gallons, while its volumetric rates for its industrial customers is $4.305 per 1,000 gallons, a difference of less than 2 percent.

Witness: Legal; Tracy B. Musgove

2. Provide in comparison form the revenue requirement developed for the wholesale customers and the revenue requirement developed for the retail customers in Excel Spreadsheet format with all cells and formulas accessible. Include all inputs that were used to determine the revenue requirements.

Response: PWWC did not calculate a revenue requirement for wholesale customers separately than a revenue requirement for retail customers. Refer to the response to Items 21 and 22 of the Commission Staff's second request for information, in which Excel spreadsheet labeled PSC 2-21 Unit Cost Worksheet was referenced. Because the original idea was to move to one flat rate for all customers, there was no differentiation between retail versus wholesale classes of customers, only a total deficit amount that needed to be covered. The projection analysis that was completed prior to having the audited data indicated a $128,923 deficit in Revenues Less Cost of Production. After the audit data was received, this deficit grew to $405,364.

Witness: Tracy B. Musgove

3. Refer to Princeton's response to the January 10, 2020 Order, Item 26.

a. Provide a timeline of increases to the wholesale rates, beginning with 1983 when the rate was initially set at $0.77 per 100 cubic feet. Provide the manner in which rate was increased each time, such as by a percentage, settlement, etc. Provide support for each rate increase.

Response: Refer to attached Exhibit Excel worksheet PSC 3-3a Wholesale Rate Comparison and Excel worksheet PSC 2-21 Unit Cost Worksheet.

There were no retail or wholesale water rate increases from 1983 until November 2000 despite the population decline and the marked decrease in small commercial businesses and industry. It appears that some calculation was performed by Quest Engineers in conjunction with the construction at the water treatment plant and the addition of the one million gallon industrial park tank. However, no formal Cost of Service Study could be located or was ever addressed in depth in the minutes, only the mention that rates should be raised by 40%. This "across the board" increase, raised rates at the lowest tier by more than 3.7x what the wholesale customer was asked to pay even though the improvements to capacity and storage was due to planned increases in the wholesale's customer base. Due to cost overruns on the aforementioned expansion, it appears the rates were increased again in 2002, but this time there was not an across the board increase. The minimum bill was increased by $1.00 with the per 100 cubic feet charge at the lowest tier increasing by $0.67 (16.8%) while the wholesale user was increased by $0.27 per 100 cubic feet (25.2%). Although a higher percentage increase was passed through to the wholesale customers, the retail

customers saw a larger dollar impact. This is an example of lower percentages yielding higher increases due to having a much higher base number and this is what continues to exacerbate the problem.

By 2004, a new board was put in place and attempts were put in place to narrow the gap between the highest and lowest tiers. The 10% discount to the wholesale customers was removed and the wholesale rate became equal to what the largest industrial user was paying. This accounted for almost a $0.15 increase per 100 cubic feet. Coupled with the 20.1% increase at the highest tier, the total increase to the wholesale customer was 33.5% versus only 11.5% at the minimum retail level. Still, the dollar amount of $0.53 per 100 cubic feet was greater at the lowest level than the $0.45 increase at the wholesale level. Another across the board increase was made in 2006 and attempts at determining the "unit cost of production" began influencing the rate decisions with the January 2011 increase and the May 2010 employment of Ms. Musgove. There are no other workpapers prior to the 2011 increase. The Unit Cost Worksheet, provided as PSC 2-21 Unit Cost Worksheet, was used from 2011 forward.

Witness: Tracy B. Musgove

4. Refer to Princeton's response to Commission Staff's Second Request for Information (Staff's Second Request), Item 5.

a. Explain how the percentage of usage compared to percentage of revenue proves subsidization.

b. Provide the revenue that Princeton derives from its 5/8" x 3/4" residential customers who have usage at or below the minimum billable amount.

c. Provide the revenue that Princeton derives from its 5/8" x 3/4" residential customers that have zero usage only.

d. Provide support for Princeton's claim of subsidization by its residential customers, given the absence of a detailed analysis of the cost to serve the residential customers.

Response: Refer to attached Exhibit Excel worksheet PSC 3-4b&c Revenue from Zero and Minimums.

a. The retail ratepayers of the PWWC continue to pay more per gallon for the water they consume compared to the wholesale groups. Ultimately, both retail and wholesale customers are receiving the same service: safe, reliable drinking water. To the extent that smaller-usage customers are paying more than half of PWWC's revenue and only receiving 37% of the water, they are subsidizing costs to provide water to the larger usage-customers.

b. In fiscal year 2019, Princeton averaged 139 customers (in its 5/8" meter categories) with zero usage every month and derived $23,785.75 from these customers.

c. In fiscal year 2019, Princeton averaged 660 customers (in its 5/8" meter categories) with usage at the minimum level (between 1-150 cubic feet) every month and derived $111, 619.75 from these customers.

d. Princeton respectfully disagrees with the suggestion that it performed "no detailed analysis of the cost to serve the residential customers." To the contrary, in establishing the monthly customer service fee, PWWC evaluated the cost of providing administrative and billing functions and determined that these costs were more reflective to the retail sector than to wholesale and determined a fair way to recoup these costs would be by a fixed monthly charge based on the number of meters which in turn placed more of the cost on the retail sector. Therefore, based on the proposed $6 monthly customer service charge, CCWD will pay ($6 x 9 x 12 = $648) annually while LCWD will pay ($6 x 6 x 12 = $432). Based on the $247,486 unallocated administrative costs shown in the PSC 2-21 Unit Cost Worksheet, the wholesale customers would only be paying $1,080 or less than 0.5% of the total.

Witness: Tracy B. Musgove

5. Refer to Princeton's response to Staff's Second Request, Item 15. Reconcile the statement that the information reviewed supports full-cost pricing with the fact that Princeton apparently did no analysis to determine the full-cost pricing of its water system.

Response: PWWC respectfully disagrees with the suggestion that it "did no analysis to determine the full-cost pricing of its water system." To the contrary, at several stages in the process, PWWC evaluated the full cost to provide water service. As previously described in PWWC's response to Item 26 of the Commission's first request for information, PWWC initially used interim data through March 2019, which was also spread and annualized to see where rates needed to be in order to recoup the costs of operating both the water and wastewater treatment facilities. The retail rates for the City of Princeton customers was set based upon this data that indicated it cost $3.36 to produce and distribute 100 cubic feet of water. PWWC later analyzed the final audit adjustments that were made and this data was input into the excel worksheets. The resulting calculation showed the cost to provide service was even higher than initially thought.

These calculations can be seen in PWWC's initial filing and the Unit Cost spreadsheet filed in response to Item 21 to Commission Staff's second request for information.

Witness: Tracy B. Musgove

6. Provide the following information for fiscal years ending June 30, 2015 – 2019.

Fiscal Years	Treatment Plant Production (Gallons)	Water Sales - Gallons					Difference Production & Sales
		Inside - City	Outside - City	Caldwell District	Lyon District	Total	
2015							
2016							
2017							
2018							
2019							

Years	Revenues - Water					Revenues Wastewater
	Inside - City	Outside - City	Caldwell District	Lyon District	Total	
2015						
2016						
2017						
2018						
2019						

Response: Refer to excel worksheet labeled PSC 3-6 2015-2019 Production vs Sales.

Witness: Tracy B. Musgove

7. Refer to Princeton's response to Staff's Second Request, Item 1.a, Pro Forma Income Statement for Fiscal Year ending June 30, 2019, Excel Spreadsheet, Tab: Pro Forma Income Stmt.

a. Princeton explains that the adjustments to its 2019 salaries and wages is based upon a 2.5 percent Cost of Living adjustment (COLA). Provide documentation that supports Princeton's proposed 2.5 percent COLA employee wage adjustments.

b. For each category listed in the table below, provide the budgeted and the actual employee wage increases Princeton granted in fiscal years ending June 30, 2015-2019.

(1) Administration
(2) Water Treatment Plant
(3) Wastewater Treatment Plant
(4) Maintenance

c. Princeton explains that the adjustment to its 2019 employee benefit expense is a 2.5 percent employee health insurance premium increase. Provide documentation that supports Princeton's proposed 2.5 percent employee health insurance premium increase.

d. Provide copies of the employee health insurance invoices for December of each fiscal year 2015-2019 that lists each employee.

e. Confirm that the pro forma amounts listed for each of the following expenses represents Princeton's 2021 budgeted/forecasted payroll as calculated in the Tab: 2021 Payroll.

(1) Salaries

(2) Payroll Tax
(3) Employee Benefits
(4) Retirement Funding

f. Given that the County Employment Retirement System (CERS) employer non-hazardous contribution rate effective July 1, 2019 is 24.06 percent, provide explain in detail why Princeton proposed to increase this rate by 12.90 percent to a pro forma CERS contribution rate of 26.95 percent.

g. Princeton proposes to adjust Account 200-6015 Chemicals Expense by $24,618, giving the following explanation: "Inv Adj in 2019. See MOR projections." Provide documentation and an itemized calculation to support the proposed chemical adjustment. Also, provide a detailed explanation of the term "MOR projections."

h. Princeton proposes to adjust Account 200-6185 Sludge Removal Expense by $28,133, giving the following explanation: "1/2 of Bi Annual lagoon cleaning." Provide copies of the invoices that supports the total lagoon cleaning cost of $56,266. Also, provide a schedule listing the lagoon cleaning costs Princeton incurred from fiscal years 2009-2018.

i. Princeton proposes to adjust Account 300-6070 Utilities Expense by $34,489, giving the following explanation: "Energy Audit Implementation." Provide a copy of Princeton's energy audit. Include an itemized calculation to support the proposed decrease.

j. Princeton proposes to adjust Account 4300-6670 Capital Cost/Labor by total of $60,166, giving the following explanation: "Return to normal after

RD capitalization." Provide itemized calculations to support the $16,091 and $34,075 adjustments. Also, provide a schedule listing the Princeton's reported Capital Cost/Labor for each fiscal year from 2009-2018.

Response:

a. Refer to Excel worksheet labeled PSC 3-7a FY2020 Salary Budget and Exhibit PSC 3-7a COLA for 2020. The Excel worksheet was finalized for the 2020 budget in May 2019 and the information as to the Consumer Price Index indicated a 2.0 % CPI while the information as to the social security adjustment for 2019 stood at 2.8%. With the variance in the two, and considering that the City had initiated a 3% wage increase, it was decided to increase salaries by 2.5%. Once approved by the board, most raises were implemented during the July 2nd pay period. However, the Superintendent chose to withhold raises to a few individuals where performance was lacking. PSC 3-10 Salary Budget FY2021 indicates the new budget for the upcoming year. Since the 2020 wages increases were implemented with the July 2, 2019 payroll, the pro forma actually needs to include this "known and measurable" expense and the additional expense that will be upcoming in the new fiscal year.

b. Refer to Excel spreadsheet labeled PSC 3-7b Budget vs Actual Wage Increases

c. Refer to Excel worksheet labeled PSC 3-7c KEHP Historical Costs.

The KEHP rates for the 2021 calendar year will be released in September 2020, several months after the budget is completed and the fiscal year is underway. The 2.5% increase is a slightly higher increase given the historical percentages recorded

since 2011 (when PWWC joined KEHP) but is thought to be conservative for budgetary purposes. The historical average increase has been 1.6%.

d. Refer to Exhibit PSC 3-7d KEHP 2015-2019. The December 2019 invoice from KEHP did not include insurance for employees hired in November. The rule for eligibility is that the new employee is eligible for health insurance on the first day of the second month after hire. Therefore, Employee # 210 was not eligible for insurance until January 1, 2020.

e. Refer to response to Items 10a and b below.

f. Princeton uses the contribution of rate of 26.95 percent because the CERS contribution rate for employers that became effective on July 1, 2020 is 26.95 percent. It, therefore, is a known-and-measurable expense.

See https://kyret.ky.gov/Employers/Pages/Contribution-Rates.aspx.

g. Refer to Excel worksheet labeled PSC 3-7g Chemical Adjustments. This worksheet indicates the amount and value of chemicals and fuel on hand as of June 30, 2019 at each of our departments. As previously mentioned, our external auditors had requested that we begin maintaining inventory data on chemicals and fuel and this was the first measurement period where the chemical inventory and fuel accounts were established. As reflected under the tab labeled WTP, the water treatment plant had chemicals on hand valued at $23,081.51 and diesel fuel valued at $1,536.00 for a total chemical adjustment of $24,617.51. The entry lowered expenses by that amount and increased assets but does not consider the amount of inventory that would have been "on hand" as of the previous fiscal year end but was used in fiscal year 2019. The

previous five year average had been $126,072.

The term "MOR Projections" refers to the Monthly Operating Reports that are submitted to Division of Water. These reports show the normalized chemical usage as being higher in the past years and in the present fiscal year; hence the need to include this adjustment as a normalized "known and measurable" expense. Please see the attached Excel file PSC 3-7g MOR Chemical Projections.

h. For a copy of the H&A Resource Management Invoice dated 8/26/19 in the amount of $56,266.64, please refer to Exhibit PSC 3-7h Lagoon Invoice 0819. In addition, please refer to Excel worksheet labeled PSC 3-7h Lagoon Cleaning History which shows more than $259,000 has been spent from 2010-2019 for the bi-annual cleaning of the water treatment plant lagoons.

i. Please refer to the following exhibits: PSC 3-7i Energy Audit of WWTP; PSC 3-7i Initial Recommendations; PSC 3-7i Emails on Energy Audit and Excel worksheet PSC 3-7i Utilities Comparison.

The 4th quarter of FY2019 began the implementation of recommendations from the Energy Audit at the WWTP. During the analysis after the first half of FY2020, it was apparent that significant savings were being realized at the WWTP. The plant was using approximately 21% fewer kilowatt hours than in the previous year and the charges were almost 20% lower. By applying the 20% savings to the 3rd quarter of 2019 and maintaining the same usage as the 4th quarter (since the energy audit was ongoing at that time), the new projection for the WWTP energy costs came in at $148,178 and was rounded to $150,000. The difference between the previous year and the $150,000

resulted in a lowering of the WWTP pro forma expenses in the amount of $34,489. (*Refer to the tab labeled "Annual" in the aforementioned Excel worksheet for these calculations)*

j. The annual entries for the 400-6670 Maintenance Department Capital Cost/Labor account have been provided in PSC 2-21 Unit Cost Worksheet – Maint tab Line 22. Unhide the columns to view data from 2009-2013. The following table lists the CREDIT balance of this expense account by year.

Fiscal Year	Balance of Acct	Comments
2009	11,668	
2010	9,818	
2011	24,298	
2012	25,421	Start of Hill & Dale water line replacement
2013	76,135	Maint office Building & Hill & Dale
2014	3,980	
2015	533	
2016	6,344	Office Remodel
2017	4,255	
2018	9,695	
2019 –(as shown on Unit Cost)	65,648	Balance prior to 1/23/20 final CPA adjustment which lowered account by $26,573
2019 – Final GL	39,075	Maple Ave Sewer Project
3/31/20 Interim	350	

In addition, refer to exhibit PSC 3-7j AJE Capital Labor for a detailed description of the $16,091 debit entry to this account which basically reversed the miscellaneous journal entries that had been made throughout the year and was done after a discussion with outside CPA. It appears that end of month entries to show work done on meter settings and sewer taps had been increasing fixed assets and adding to revenue by lowering the expenses. It was decided that unless the project is sizeable, such as the complete replacement of sewer laterals on Maple Ave, these entries are no longer required. In

the instance of a sizeable internal construction project, this account will be used to net out the labor and equipment charges associated with new capital assets, such as was the case with the Maple Ave sewer line upgrade and the use of internal labor on the RD water line project. Many projects can be done internally at a cost much less than outside contractors. In the past, internal labor has been used to upgrade the water lines in the Hill and Dale subdivision, build a new maintenance office building, remodel the office headquarters, and rebuild a bridge on maintenance property, among others. Since this entry effectively lowers the expenses of the department through capitalizing the asset, the normalizing of adding this amount back reflects the true cash outlay regarding the maintenance force.

The second pro forma entry of $34,075 was merely the balance that it would take to reduce this account balance to a minimal $5,000 level. Interim data shows the account at 3/31/20 has a $350 credit balance which supports an even lower amount than what was indicated. The new budget ceases having any contra expense account.

Witness: Tracy B. Musgove

Exhibit PSC 3-7a

COLA for 2020

https://www.bls.gov/news.release/archives/cpi_05102019.htm

Consumer Price Index News Release

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Transmission of material in this release is embargoed until
8:30 a.m. (EDT) May 10, 2019                    USDL-19-0776

Technical information: (202) 691-7000  cpi_info@bls.gov  www.bls.gov/cpi
Media Contact:         (202) 691-5902  PressOffice@bls.gov

CONSUMER PRICE INDEX – APRIL 2019

The Consumer Price Index for All Urban Consumers (CPI-U) increased 0.3
percent in April on a seasonally adjusted basis after rising 0.4 percent
in March, the U.S. Bureau of Labor Statistics reported today. Over the
last 12 months, the all items index increased 2.0 percent before seasonal
adjustment.
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https://www.aarp.org/retirement/social-security/questions-answers/social-security-calculate-cola/

How does Social Security calculate the COLA?

Your Social Security payment typically is adjusted annually for inflation to ensure that the purchasing power of benefits is not eroded by rising prices. This cost-of-living adjustment, or COLA, tracks inflation using the government's measure of consumer prices for a variety of household goods and services.

Benefits go up if there is a measurable increase (at least 0.1 percent) in this price index from year to year. For 2020, the Social Security Administration implemented a 1.6 percent cost-of-living increase. The COLA was 2.8 percent in 2019, 2 percent in 2018 and 0.3 percent in 2017. There was no increase in 2016.

Exhibit PSC 3-7d

KEHP 2015-2019

Confirmation of payment

PRINCETON WATER & WASTE / 101 E. MARKET ST / PRINCETON KY 42445

Your ACH Confirmation Number: 12468762
Your ACH Payment Date is: 12/11/2015
You have paid the bills listed. We are debiting your bank account Operation & Maintenance by: USD 21,783.50
The system has saved your payment under transaction number 1471625134.
To access the open bills, click on *Back to Bill List*.

Bill Description	Due On	Billed Amount	Open	Payment Amount
Health Premiums	Jan 4, 2016	USD 20,883.38	USD 0.00	USD 20,883.38
Admin Fees	Jan 4, 2016	USD 139.46	USD 0.00	USD 139.46
FSA 2015	Jan 4, 2016	USD 158.33	USD 0.00	USD 158.33
Life Premiums	Jan 4, 2016	USD 94.00	USD 0.00	USD 94.00
HRA Waiver	Jan 4, 2016	USD 350.00	USD 0.00	USD 350.00
FSA 2015	Dec 15, 2015	USD 158.33	USD 0.00	USD 158.33
			Grand Total	USD 21,783.50
			Credits	USD 0.00
			Total Net Payment Amount	USD 21,783.50

Back to Bill List | Print Screen

Questions or Comments?

Health Billing Questions: Contact the Financial Management Branch at (502) 564-9097
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday

FSA Billing Questions: Contact the Flexible Benefits Branch at (502) 564-0350
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday.

Life Insurance Questions: Contact the Life Insurance Branch at (502) 564-4774
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday

Enrollment Questions: Contact the Enrollment Information Branch at (502) 564-1205
Business Hours are 7:30 am to 4:30 pm, EST Monday through Friday

The Member Services Branch can be reached, toll free, at 888-581-8834.
Business hours are 8:00 am to 4:30 pm, EST, Monday through Friday.

EMPLOYEE INSURANCE

EMPLOYEE LAST NAME	FIRST NAME	PWW PD LIFE INS	ADD'L. EMP. PD LIFE INS	ADD'L. EMP. PD LIFE INS	FLEX MONTHLY	WAIVER HEALTH INS	ADMIN. FEES	LIVING WELL CDHP FAMILY	LIVING WELL CDHP COUPLE	LIVING WELL CDHP PARENT PLUS	STANDARD PPO FAMILY	LIVING WELL CDHP FAMILY X-REF	LIVING WELL CDHP SINGLE	LIVING WELL PPO FAMILY	TOTAL	WEEKLY AMT PD BY EMP FOR HEALTH INS	AMT. PD BY EMP IN 4 WK MO.	AMT. PD BY EMP IN 5 WK MO.	HEALTH INS PD BY PWW 4 WK MO	HEALTH INS PD BY PWW 5 WK MO
	171	$ 1.00	$ -	$ -	$ -	$ -	$ 7.34	$ 1,432.06	$ -	$ -	$ -		$ -		$ 1,440.40	$ -	$ -	$ -	$ 1,439.40	
	202	$ 1.00	$ -	$ -	$ -		$ 7.34	$ -	$ -	$ -	$ -		$ 689.28		$ 697.62	$ -	$ -	$ -	$ 696.62	
	188	$ 1.00	$ -	$ -	$ -	$ -	$ 7.34	$ 1,432.06	$ -	$ -	$ -		$ -		$ 1,440.40	$ -	$ -	$ -	$ 1,439.40	
	191	$ 1.00	$ -	$ 9.14	$ -	$ -	$ 7.34	$ -	$ 1,282.84	$ -	$ -		$ -		$ 1,300.32	$ -	$ -	$ -	$ 1,290.18	
	195	$ 1.00	$ 6.72	$ -	$ -	$ -	$ 7.34	$ -	$ -	$ -	$ -		$ 689.28		$ 704.34	$ -	$ -	$ -	$ 696.62	
	189	$ 1.00	$ -	$ -	$ -	$ -	$ 7.34	$ 1,432.06	$ -	$ -	$ -		$ -		$ 1,440.40	$ -	$ -	$ -	$ 1,439.40	
	200	$ 1.00	$ -	$ -	$ -		$ 7.34	$ -	$ -	$ -	$ -		$ 689.28		$ 697.62	$ -	$ -	$ -	$ 696.62	
	162	$ 1.00	$ 6.00	$ 9.14	$ -	$ -	$ 7.34	$ -	$ 1,282.84	$ -	$ -		$ -		$ 1,306.32	$ -	$ -	$ -	$ 1,290.18	
	193	$ 1.00	$ 15.00	$ 9.14	$ 100.00	$ -	$ 7.34	$ 1,432.06	$ -	$ -	$ -		$ -		$ 1,564.54	$ -	$ -	$ -	$ 1,439.40	
	175	$ 1.00	$ -	$ -	$ 130.00	$ -	$ 7.34	$ 1,432.06	$ -	$ -	$ -		$ -		$ 1,570.40	$ -	$ -	$ -	$ 1,439.40	
	192	$ 1.00	$ 2.40	$ -	$ -	$ -	$ 7.34	$ 1,432.06	$ -	$ -	$ -		$ -		$ 1,442.80	$ -	$ -	$ -	$ 1,439.40	
	186	$ 1.00	$ 6.00	$ 11.46	$ -	$ -	$ 7.34	$ 1,432.06	$ -	$ -	$ -		$ -		$ 1,457.86	$ -	$ -	$ -	$ 1,439.40	
	199	$ 1.00	$ -	$ -	$ -	$ 175.00	$ 7.34	$ -	$ -	$ -	$ -		$ -		$ 183.34	$ -	$ -	$ -	$ 182.34	
	173	$ 1.00	$ -	$ -	$ 86.66	$ -	$ 7.34	$ 1,432.06	$ -	$ -	$ -		$ -		$ 1,527.06	$ -	$ -	$ -	$ 1,439.40	
	165	$ 1.00	$ -	$ -	$ -	$ -	$ 7.34	$ -	$ 1,282.84	$ -	$ -		$ -		$ 1,291.18	$ -	$ -	$ -	$ 1,290.18	
	155	$ 1.00	$ -	$ -	$ -	$ -	$ 7.34	$ -	$ 1,282.84	$ -	$ -		$ -		$ 1,291.18	$ -	$ -	$ -	$ 1,290.18	
	181	$ 1.00	$ -	$ -	$ -	$ -	$ 7.34	$ -	$ -	$ -	$ -	$ 795.64	$ -		$ 803.98	$ -	$ -	$ -	$ 802.98	
	198	$ 1.00	$ -	$ -	$ -	$ 175.00	$ 7.34	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 183.34				$ 182.34	
	115	$ 1.00	$ -	$ -	$ -	$ -	$ 7.34	$ 1,432.06	$ -	$ -	$ -		$ -		$ 1,440.40	$ -	$ -	$ -	$ 1,439.40	
TOTALS		$ 19.00	$ 35.12	$ 38.88	$ 316.66	$ 350.00	$ 139.46	$ 12,888.54	$ 5,131.36	$ -	$ -	$ 795.64	$ 2,067.84	$ -	$ 21,783.50	$ -	$ -	$ -	$ 21,372.84	$ -

$ 75.00 TOTAL LIFE PD BY EMPLOYEES

$ 94.00

TOTAL HEALTH INS PREMIUMS: $ 20,883.38
TOTAL LIFE INS PREMIUMS: $ 94.00
FLEX PMTS = $ 316.66
TOTAL ADMIN FEES = $ 139.46
WAIVER HEALTH INS. $ 350.00

$ 21,783.50

***Check to see if it says POSTED OR IN CLARIFICATION DOES NOT NEED TO SAY IN CLARIFICATION!!! IF SO-CALL KIM RICHEY!!!

TOTAL BILL	$ 21,783.50
LESS FLEX	$ 158.33
NET TOTAL BILL	$ 21,625.17

1/2 FLEX:

TRACY	$ 50.00
JAMES	$ 65.00
ADAM	$ 43.33
TOTAL	$ 158.33

HEALTH INS PD BY PWW 4WK MO:

ADMIN	$ 5,790.72	
WTP	$ 4,229.18	
WWTP	$ 3,459.32	
MAINT	$ 7,893.62	
	$ 21,372.84	TOTAL
INS/EMP	$ -	
L.INS/EMP	$ 75.00	
L.INS/PWW	$ 19.00	
FLEX	$ 316.66	
TOTAL	$ 21,783.50	

HEALTH INS PD BY PWW 5 WK MO:

ADMIN	$ -	
WTP	$ -	
WWTP	$ -	
MAINT	$ -	
	$ -	TOTAL
INS/EMP	$ -	
L.INS/EMP	$ 75.00	
L.INS/PWW	$ 19.00	
FLEX	$ 316.66	
TOTAL	$ 410.66	

Confirmation of payment

PRINCETON WATER & WASTE / 101 E. MARKET ST / PRINCETON KY 42445

Your ACH Confirmation Number: 18586020
Your ACH Payment Date is: 12/12/2016
You have paid the bills listed. We are debiting your bank account Operation & Maintenance by: USD 21,443.28
The system has saved your payment under transaction number \503239960.
To access the open bills, click on *Back to Bill List*.

Bill Description	Due On	Billed Amount	Open	Payment Amount
Health Premiums	Jan 3, 2017	USD 20,516.60	USD 0.00	USD 20,516.60
Admin Fees	Jan 3, 2017	USD 143.28	USD 0.00	USD 143.28
FSA	Jan 3, 2017	USD 171.66	USD 0.00	USD 171.66
Life Premiums	Jan 3, 2017	USD 90.08	USD 0.00	USD 90.08
HRA Waiver	Jan 3, 2017	USD 350.00	USD 0.00	USD 350.00
FSA	Dec 15, 2016	USD 171.66	USD 0.00	USD 171.66
			Grand Total	USD 21,443.28
			Credits	USD 0.00
			Total Net Payment Amount	USD 21,443.28

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Questions or Comments?

Health/FSA Billing Questions: Contact the Premium Billing Branch at (502) 564-4007
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday

Life Insurance Questions: Contact the Life Insurance Branch at (502) 564-4774
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday.

Enrollment Questions: Contact the Enrollment Information Branch at (502) 564-1205
Business Hours are 7:30 am to 4:30 pm, EST Monday through Friday

The Member Services Branch can be reached, toll free, at 888-581-5834
Business hours are 8:00 am to 4:30 pm, EST, Monday through Friday.

EMPLOYEE INSURANCE

EMPLOYEE LAST NAME	FIRST NAME	PWW PD LIFE INS	ADD'L EMP. PD LIFE INS	ADD'L EMP. PD LIFE INS	FLEX MONTHLY	WAIVER HEALTH INS	ADMIN. FEES	LIVING WELL CDHP FAMILY	LIVING WELL CDHP COUPLE	LIVING WELL CDHP PARENT PLUS	STANDARD PPO FAMILY	LIVING WELL CDHP FAMILY X-REF	LIVING WELL CDHP SINGLE	LIVING WELL PPO FAMILY	TOTAL	WEEKLY AMT PD BY EMP FOR HEALTH INS	AMT. PD BY EMP IN 4 WK MO.	AMT. PD BY EMP IN 5 WK MO.	HEALTH INS PD BY PWW 4 WK MO	HEALTH INS PD BY PWW 5 WK MO
	171	$ 1.00	$ -	$ -	$ -	$ -	$ 7.96		$ -	$ 967.18	$ -		$ -		$ 976.14	$ -	$ -	$ -	$ 975.14	
	202	$ 1.00	$ -	$ -	$ -		$ 7.96	$ -	$ -	$ -	$ -		$ 702.10		$ 711.06	$ -	$ -	$ -	$ 710.06	
	188	$ 1.00	$ -	$ -	$ -	$ -	$ 7.96	$ 1,453.94	$ -	$ -	$ -		$ -		$ 1,462.90	$ -	$ -	$ -	$ 1,461.90	
	191	$ 1.00	$ -	$ 9.14	$ -	$ -	$ 7.96	$ -	$ 1,302.74	$ -	$ -		$ -		$ 1,320.84	$ -	$ -	$ -	$ 1,310.70	
	189	$ 1.00	$ -	$ -	$ -	$ -	$ 7.96	$ 1,453.94	$ -	$ -	$ -		$ -		$ 1,462.90	$ -	$ -	$ -	$ 1,461.90	
	200	$ 1.00	$ -	$ -	$ -		$ 7.96	$ -	$ -	$ -	$ -		$ 702.10		$ 711.06	$ -	$ -	$ -	$ 710.06	
	162	$ 1.00	$ 9.80	$ 9.14	$ -	$ -	$ 7.96	$ -	$ 1,302.74	$ -	$ -		$ -		$ 1,330.64	$ -	$ -	$ -	$ 1,310.70	
	193	$ 1.00	$ 15.00	$ 9.14	$ 90.00	$ -	$ 7.96		$ 1,302.74	$ -	$ -		$ -		$ 1,425.84	$ -	$ -	$ -	$ 1,310.70	
	175	$ 1.00	$ -	$ -	$ 166.66	$ -	$ 7.96	$ 1,453.94	$ -	$ -	$ -		$ -		$ 1,629.56	$ -	$ -	$ -	$ 1,461.90	
	192	$ 1.00	$ 2.40	$ -	$ -	$ -	$ 7.96	$ 1,453.94	$ -	$ -	$ -		$ -		$ 1,465.30	$ -	$ -	$ -	$ 1,461.90	
	186	$ 1.00	$ 6.00	$ 11.46	$ -	$ -	$ 7.96	$ 1,453.94	$ -	$ -	$ -		$ -		$ 1,480.36	$ -	$ -	$ -	$ 1,461.90	
	199	$ 1.00	$ -	$ -	$ -	$ 175.00	$ 7.96	$ -	$ -	$ -	$ -		$ -		$ 183.96	$ -	$ -	$ -	$ 182.96	
	173	$ 1.00	$ -	$ -	$ 86.66	$ -	$ 7.96	$ 1,453.94	$ -	$ -	$ -		$ -		$ 1,549.56	$ -	$ -	$ -	$ 1,461.90	
	165	$ 1.00	$ -	$ -	$ -	$ -	$ 7.96	$ -	$ 1,302.74	$ -	$ -		$ -		$ 1,311.70	$ -	$ -	$ -	$ 1,310.70	
	181	$ 1.00	$ -	$ -	$ -	$ -	$ 7.96	$ 1,453.94	$ -	$ -	$ -		$ -		$ 1,462.90	$ -	$ -	$ -	$ 1,461.90	
	198	$ 1.00	$ -	$ -	$ -	$ 175.00	$ 7.96	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 183.96				$ 182.96	
	115	$ 1.00	$ -	$ -	$ -	$ -	$ 7.96	$ 1,453.94	$ -	$ -	$ -		$ -		$ 1,462.90	$ -	$ -	$ -	$ 1,461.90	
	203	$ 1.00	$ -	$ -	$ -		$ 7.96	$ -	$ 1,302.74	$ -	$ -		$ -		$ 1,311.70	$ -	$ -	$ -	$ 1,310.70	
TOTALS		$ 18.00	$ 33.20	$ 38.88	$ 343.32	$ 350.00	$ 143.28	$ 11,631.52	$ 5,210.96	$ 967.18	$ -	$ -	$ 1,404.20	$ -	$ 21,443.28	$ -	$ -	$ -	$ 21,009.88	$ -

$ 72.08 TOTAL LIFE PD BY EMPLOYEES

$ 90.08

TOTAL HEALTH INS PREMIUMS: $ 19,213.86
TOTAL LIFE INS PREMIUMS: $ 90.08
FLEX PMTS = $ 343.32
TOTAL ADMIN FEES = $ 143.28
WAIVER HEALTH INS. $ 350.00

$ 20,140.54

***Check to see if it says POSTED OR IN CLARIFICATION DOES NOT NEED TO SAY IN CLARIFICATION!!! IF SO-CALL KIM RICHEY!!!!

TOTAL BILL	$ 21,443.28
LESS FLEX	$ 171.66
NET TOTAL BILL	$ 21,271.62

1/2 FLEX:

TRACY	$ 45.00
JAMES	$ 83.33
ADAM	$ 43.33
TOTAL	$ 171.66

HEALTH INS PD BY PWW 4WK MO:

ADMIN	$ 3,930.70	
WTP	$ 4,944.56	
WWTP	$ 3,514.42	
MAINT	$ 8,620.20	
	$ 21,009.88	TOTAL
INS/EMP	$ -	
L.INS/EMP	$ 72.08	
L.INS/PWW	$ 18.00	
FLEX	$ 343.32	
TOTAL	$ 21,443.28	

HEALTH INS PD BY PWW 5 WK MO:

ADMIN	$ -	
WTP	$ -	
WWTP	$ -	
MAINT	$ -	
	$ -	TOTAL
INS/EMP	$ -	
L.INS/EMP	$ 72.08	
L.INS/PWW	$ 17.00	
FLEX	$ 343.32	
TOTAL	$ 432.40	

Confirmation of payment

PRINCETON WATER & WASTE / 101 E. MARKET ST / PRINCETON KY 42445

Your ACH Confirmation Number: 24573328
Your ACH Payment Date is: 12/08/2017
You have paid the bills listed. We are debiting your bank account Operation & Maintenance by: USD 22,121.10
The system has saved your payment under transaction number \534417797.
To access the open bills, click on *Back to Bill List*.

Bill Description	Due On	Billed Amount	Open	Payment Amount
Health Premiums	Dec 31, 2017	USD 21,363.92	USD 0.00	USD 21,363.92
Admin Fees	Dec 31, 2017	USD 149.04	USD 0.00	USD 149.04
FSA	Dec 31, 2017	USD 181.00	USD 0.00	USD 181.00
Life Premiums	Dec 31, 2017	USD 71.14	USD 0.00	USD 71.14
HRA Waiver	Dec 31, 2017	USD 175.00	USD 0.00	USD 175.00
FSA	Dec 15, 2017	USD 181.00	USD 0.00	USD 181.00
			Grand Total	USD 22,121.10
			Credits	USD 0.00
			Total Net Payment Amount	USD 22,121.10

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Questions or Comments?

Health/FSA Billing Questions: Contact the Premium Billing Branch at (502) 564-9097.
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday

Life Insurance Questions: Contact the Life Insurance Branch at (502) 564-4774.
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday.

Enrollment Questions: Contact the Enrollment Information Branch at (502) 564-1205
Business Hours are 7:30 am to 4:30 pm, EST Monday through Friday

The Member Services Branch can be reached, toll free, at 888-581-4834
Business hours are 8:00 am to 4:30 pm, EST, Monday through Friday

EMPLOYEE INSURANCE 2017

EMPLOYEE LAST NAME	FIRST NAME	PWW PD LIFE INS	ADD'L. EMP. PD LIFE INS	ADD'L. EMP. PD LIFE INS	FLEX MONTHLY	WAIVER HEALTH INS	ADMIN. FEES	LIVING WELL CDHP FAMILY	LIVING WELL CDHP COUPLE	LIVING WELL CDHP SECONDARY	LIVING WELL CDHP PARENT PLUS	STANDARD PPO SINGLE	LIVING WELL CDHP FAMILY X-REF	LIVING WELL CDHP SINGLE	LIVING WELL PPO FAMILY	TOTAL	WEEKLY AMT PD BY EMP FOR HEALTH INS	AMT. PD BY EMP IN 4 WK MO.	AMT. PD BY EMP IN 5 WK MO.	HEALTH INS PD BY PWW 4 WK MO	HEALTH INS PD BY PWW 5 WK MO
	205	$ 1.00	$ -	$ -	$ -		$ 8.28	$ -	$ -	$ 810.00	$ -	$ -		$ -		$ 819.28	$ -	$ -	$ -	$ 818.28	
	202	$ 1.00	$ -	$ -	$ -		$ 8.28	$ -	$ -		$ -	$ -		$ 702.10		$ 711.38	$ -	$ -	$ -	$ 710.38	
	188	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,453.94	$ -		$ -	$ -		$ -		$ 1,463.22	$ -	$ -	$ -	$ 1,462.22	
	191	$ 1.00	$ -	$ 9.14	$ -	$ -	$ 8.28	$ -	$ 1,302.74		$ -	$ -		$ -		$ 1,321.16	$ -	$ -	$ -	$ 1,311.02	
	206	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ -	$ -		$ -	$ -		$ 702.10		$ 711.38	$ -	$ -	$ -	$ 710.38	
	195	$ 1.00					$ 8.28	$ 1,453.94						$ -		$ 1,463.22				$ 1,462.22	
	189	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,453.94	$ -		$ -	$ -		$ -		$ 1,463.22	$ -	$ -	$ -	$ 1,462.22	
	200	$ 1.00					$ 8.28							$ 702.10		$ 711.38				$ 710.38	
	204	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,453.94	$ -		$ -	$ -		$ -		$ 1,463.22	$ -	$ -	$ -	$ 1,462.22	
	193	$ 1.00	$ 15.00	$ 9.14	$ 50.00	$ -	$ 8.28		$ 1,302.74		$ -	$ -		$ -		$ 1,386.16	$ -	$ -	$ -	$ 1,311.02	
	175	$ 1.00	$ -	$ -	$ 208.00	$ -	$ 8.28	$ 1,453.94	$ -		$ -	$ -		$ -		$ 1,671.22	$ -	$ -	$ -	$ 1,462.22	
	192	$ 1.00	$ 2.40	$ -	$ -	$ -	$ 8.28	$ 1,453.94	$ -		$ -	$ -		$ -		$ 1,465.62	$ -	$ -	$ -	$ 1,462.22	
	186	$ 1.00	$ 6.00	$ 11.46	$ -	$ -	$ 8.28	$ 1,453.94	$ -		$ -	$ -		$ -		$ 1,480.68	$ -	$ -	$ -	$ 1,462.22	
	199	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ -	$ 1,302.74		$ -	$ -		$ -		$ 1,312.02	$ -	$ -	$ -	$ 1,311.02	
	173	$ 1.00	$ -	$ -	$ 104.00	$ -	$ 8.28	$ 1,453.94	$ -		$ -	$ -		$ -		$ 1,567.22	$ -	$ -	$ -	$ 1,462.22	
	181	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,453.94	$ -		$ -	$ -		$ -		$ 1,463.22	$ -	$ -	$ -	$ 1,462.22	
	198	$ 1.00	$ -	$ -	$ -	$ 175.00	$ 8.28	$ -	$ -		$ -	$ -	$ -	$ -	$ -	$ 184.28				$ 183.28	
	115	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,453.94	$ -		$ -	$ -		$ -		$ 1,463.22	$ -	$ -	$ -	$ 1,462.22	
TOTALS		$ 18.00	$ 23.40	$ 29.74	$ 362.00	$ 175.00	$ 149.04	$ 14,539.40	$ 3,908.22	$ 810.00	$ -	$ -	$ -	$ 2,106.30	$ -	$ 22,121.10	$ -	$ -	$ -	$ 21,687.96	$ -

$ 53.14 TOTAL LIFE PD BY EMPLOYEES

$ 71.14

TOTAL HEALTH INS PREMIUMS: $ 21,363.92
TOTAL LIFE INS PREMIUMS: $ 71.14
FLEX PMTS = $ 362.00
TOTAL ADMIN FEES = $ 149.04
WAIVER HEALTH INS: $ 175.00

$ 22,121.10

***Check to see if it says POSTED OR IN CLARIFICATION DOES NOT NEED TO SAY IN CLARIFICATION!!! IF SO-CALL KIM RICHEY!!!!

TOTAL BILL	$ 22,121.10
LESS FLEX	$ 181.00
NET TOTAL BILL	$ 21,940.10

1/2 FLEX:

TRACY	$ 25.00
JAMES	$ 104.00
ADAM	$ 52.00
TOTAL	$ 181.00

HEALTH INS PD BY PWW 4WK MO:		
ADMIN	$ 4,418.74	
WTP	$ 5,656.22	
WWTP	$ 2,839.68	
MAINT	$ 8,773.32	
	$ 21,687.96	TOTAL
INS/EMP	$ -	
L.INS/EMP	$ 53.14	
L.INS/PWW	$ 18.00	
FLEX	$ 362.00	
TOTAL	$ 22,121.10	

HEALTH INS PD BY PWW 5 WK MO:		
ADMIN	$ -	
WTP	$ -	
WWTP	$ -	
MAINT	$ -	
	$ -	TOTAL
INS/EMP	$ -	
L.INS/EMP	$ 53.14	
L.INS/PWW	$ 18.00	
FLEX	$ 362.00	
TOTAL	$ 433.14	

Confirmation of payment

PRINCETON WATER & WASTE / 101 E. MARKET ST / PRINCETON KY 42445

Your ACH Confirmation Number: 32433276
Your ACH Payment Date is: 12/10/2018
You have paid the bills listed. We are debiting your bank account Operation & Maintenance by: USD 22,682.94

The system has saved your payment under transaction number \566134448.

To access the open bills, click on *Back to Bill List*.

Bill Description	Due On	Billed Amount	Open	Payment Amount
FSA	Dec 31, 2018	USD 261.65	USD 0.00	USD 261.65
Life Premiums	Dec 31, 2018	USD 209.48	USD 0.00	USD 209.48
Health Premiums	Dec 31, 2018	USD 21,634.00	USD 0.00	USD 21,634.00
Admin Fees	Dec 31, 2018	USD 140.76	USD 0.00	USD 140.76
HRA Waiver	Dec 31, 2018	USD 175.00	USD 0.00	USD 175.00
FSA	Dec 15, 2018	USD 261.65	USD 0.00	USD 261.65
			Grand Total	USD 22,682.94
			Credits	USD 0.00
			Total Net Payment Amount	USD 22,682.94

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Questions or Comments?

***ATTENTION BILLING LIAISONS: DEI WILL BE REQUIRING ACH PAYMENTS EFFECTIVE 7/1/18**

Health/FSA/Life Billing Questions: Contact the Premium Billing Branch at (502) 564-9097.
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday.

Life Insurance Questions: Contact the Life Insurance Branch at (502) 564-4774.
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday.

Enrollment Questions: Contact the Enrollment Information Branch at (502) 564-1205.
Business Hours are 7:30 am to 4:30 pm, EST Monday through Friday.

The Member Services Branch can be reached, toll free, at 888-581-8834.
Business hours are 8:00 am to 4:30 pm, EST, Monday through Friday.

EMPLOYEE INSURANCE

EMPLOYEE LAST NAME	FIRST NAME	PWW PD LIFE INS	ADD'L. EMP. PD LIFE INS	ADD'L. EMP. PD LIFE INS	FLEX MONTHLY	WAIVER HEALTH INS	ADMIN. FEES	LIVING WELL CDHP FAMILY	LIVING WELL CDHP COUPLE	LIVING WELL CDHP SECONDARY	LIVING WELL CDHP PARENT PLUS	STANDARD PPO SINGLE	LIVING WELL CDHP FAMILY X-REF	LIVING WELL CDHP SINGLE	LIVING WELL PPO FAMILY	TOTAL	WEEKLY AMT PD BY EMP FOR HEALTH INS	AMT. PD BY EMP IN 4 WK MO.	AMT. PD BY EMP IN 5 WK MO.	HEALTH INS PD BY PWW 4 WK MO.
	205	$ 1.00	$ 13.80	$ 21.08	$ 83.50		$ 8.28	$ 1,489.76	$ -	$ -	$ -	$ -		$ -		$ 1,617.42	$ -	$ -	$ -	$ 1,498.04
	207	$ 1.00	$ -	$ -	$ -		$ 8.28	$ -	$ -		$ -	$ -		$ 709.46		$ 718.74	$ -	$ -	$ -	$ 717.74
	202	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,499.04	$ -	$ -	$ -	$ 1,498.04
	188	$ 1.00	$ -	$ 8.42	$ -	$ -	$ 8.28	$ -	$ 1,333.64		$ -	$ -		$ -		$ 1,351.34	$ -	$ -	$ -	$ 1,341.92
	191	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ -	$ 1,333.64		$ -	$ -		$ -		$ 1,342.92	$ -	$ -	$ -	$ 1,341.92
	206	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,499.04	$ -	$ -	$ -	$ 1,498.04
	189	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,499.04	$ -	$ -	$ -	$ 1,498.04
	204	$ 1.00	$ 45.08	$ 16.82	$ -	$ -	$ 8.28		$ 1,333.64		$ -	$ -		$ -		$ 1,404.82	$ -	$ -	$ -	$ 1,341.92
	193	$ 1.00	$ -	$ -	$ 220.82	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,719.86	$ -	$ -	$ -	$ 1,498.04
	175	$ 1.00	$ 2.22	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,501.26	$ -	$ -	$ -	$ 1,498.04
	192	$ 1.00	$ 5.52	$ 10.54	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,515.10	$ -	$ -	$ -	$ 1,498.04
	186	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ -	$ 1,333.64		$ -	$ -		$ -		$ 1,342.92	$ -	$ -	$ -	$ 1,341.92
	199	$ 1.00	$ -	$ 13.80	$ 83.32	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,596.16	$ -	$ -	$ -	$ 1,498.04
	173	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,499.04	$ -	$ -	$ -	$ 1,498.04
	181	$ 1.00	$ -	$ 55.20	$ -	$ 175.00	$ 8.28	$ -	$ -		$ -	$ -	$ -	$ -	$ -	$ 239.48				$ 183.28
	198	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ -	$ 1,333.64		$ -	$ -		$ -		$ 1,342.92	$ -	$ -	$ -	$ 1,341.92
	115	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,499.04	$ -	$ -	$ -	$ 1,498.04
TOTALS		$ 17.00	$ 66.62	$125.86	$ 387.64	$ 175.00	$ 140.76	$14,897.60	$ 6,668.20	$ -	$ -	$ -	$ -	$ 709.46	$ -	$23,188.14	$ -	$ -	$ -	$ 22,591.02

$192.48 TOTAL LIFE PD BY EMPLOYEES

$ 209.48

TOTAL HEALTH INS PREMIUMS:	$22,275.26
TOTAL LIFE INS PREMIUMS:	$ 209.48
FLEX PMTS =	$ 387.64
TOTAL ADMIN FEES =	$ 140.76
WAIVER HEALTH INS:	$ 175.00
	$23,188.14

***Check to see if it says POSTED OR IN CLARIFICATION DOES NOT NEED TO SAY IN CLARIFICATION!!! IF SO-CALL KIM RICHEY!!!!

TOTAL BILL	$23,188.14
LESS FLEX	$ 193.82
NET TOTAL BILL	$22,994.32

1/2 FLEX:

J.ASHER	$ 41.75
JAMES	$ 110.41
ADAM	$ 41.66
TOTAL	$ 193.82

HEALTH INS PD BY PWW 4WK MO:		
ADMIN	$ 4,521.28	
WTP	$ 5,679.92	
WWTP	$ 3,557.70	
MAINT	$ 8,832.12	
	$ 22,591.02	TOTAL
INS/EMP	$ -	
L.INS/EMP	$ 192.48	
L.INS/PWW	$ 17.00	
FLEX	$ 387.64	
TOTAL	$ 23,188.14	

PRINCETON WATER & WASTE

Confirmation of payment

Your ACH Confirmation Number: 48553480
Your ACH Payment Date is: 12/12/2019
You have paid the bills listed. We are debiting your bank account Operation & Maintenance by: USD 23,168.14

The system has saved your payment under transaction number 1597637597.

To access the open bills, click on *Back to Bill List*.

Bill Description	Due On	Billed Amount	Open	Payment Amount
FSA	Dec 31, 2019	USD 193.82	USD 0.00	USD 193.82
Life Premiums	Dec 31, 2019	USD 209.48	USD 0.00	USD 209.48
Health Premiums	Dec 31, 2019	USD 22,275.26	USD 0.00	USD 22,275.26
Admin Fees	Dec 31, 2019	USD 140.70	USD 0.00	USD 140.70
KRA Waiver	Dec 31, 2019	USD 175.00	USD 0.00	USD 175.00
FSA	Dec 15, 2019	USD 193.82	USD 0.00	USD 193.82
			Grand Total	USD 23,168.14
			Credits	USD 0.00
			Total Net Payment Amount	USD 23,168.14

Back to Bill List | Print Screen

Questions or Comments?

***ATTENTION BILLING LIAISONS: DEI WILL BE REQUIRING ACH PAYMENTS EFFECTIVE 7/1/18**

Health/FSA/Life Billing Questions: Contact the Premium Billing Branch at (502) 564-9097.
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday.

Life Insurance Questions: Contact the Life Insurance Branch at (502) 564-4774.
Business Hours are 7:30 am to 4:30 pm EST, Monday through Friday.

Enrollment Questions: Contact the Enrollment Information Branch at (502) 564-1205.
Business Hours are 7:30 am to 4:30 pm, EST Monday through Friday.

The Member Services Branch can be reached, toll free, at 888-581-8834.
Business hours are 8:00 am to 4:30 pm, EST, Monday through Friday.

EMPLOYEE INSURANCE

EMPLOYEE LAST NAME	FIRST NAME	PWW PD LIFE INS	ADD'L. EMP. PD LIFE INS	ADD'L. EMP. PD LIFE INS	FLEX MONTHLY	WAIVER HEALTH INS	ADMIN. FEES	LIVING WELL CDHP FAMILY	LIVING WELL CDHP COUPLE	LIVING WELL CDHP SECONDARY	LIVING WELL CDHP PARENT PLUS	STANDARD PPO SINGLE	LIVING WELL CDHP FAMILY X-REF	LIVING WELL CDHP SINGLE	LIVING WELL PPO FAMILY	TOTAL	WEEKLY AMT PD BY EMP FOR HEALTH INS	AMT. PD BY EMP IN 4 WK MO.	AMT. PD BY EMP IN 5 WK MO.	HEALTH INS PD BY PWW 4 WK MO.
	205	$ 1.00	$ 13.80	$ 21.08	$ 83.50		$ 8.28	$ 1,489.76	$ -	$ -	$ -	$ -		$ -		$ 1,617.42	$ -	$ -	$ -	$ 1,498.04
	202	$ 1.00	$ -	$ -	$ -		$ 8.28	$ -	$ -		$ -	$ -		$ 709.46		$ 718.74	$ -	$ -	$ -	$ 717.74
	188	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,499.04	$ -	$ -	$ -	$ 1,498.04
	191	$ 1.00	$ -	$ 8.42	$ -	$ -	$ 8.28	$ -	$ 1,333.64		$ -	$ -		$ -		$ 1,351.34	$ -	$ -	$ -	$ 1,341.92
	206	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ -	$ 1,333.64		$ -	$ -		$ -		$ 1,342.92	$ -	$ -	$ -	$ 1,341.92
	189	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,499.04	$ -	$ -	$ -	$ 1,498.04
	209	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,499.04	$ -	$ -	$ -	$ 1,498.04
	193	$ 1.00	$ 45.08	$ 16.82	$ -	$ -	$ 8.28		$ 1,333.64		$ -	$ -		$ -		$ 1,404.82	$ -	$ -	$ -	$ 1,341.92
	175	$ 1.00	$ -	$ -	$ 220.82	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,719.86	$ -	$ -	$ -	$ 1,498.04
	192	$ 1.00	$ 2.22	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,501.26	$ -	$ -	$ -	$ 1,498.04
	186	$ 1.00	$ 5.52	$ 10.54	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,515.10	$ -	$ -	$ -	$ 1,498.04
	199	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ -	$ 1,333.64		$ -	$ -		$ -		$ 1,342.92	$ -	$ -	$ -	$ 1,341.92
	173	$ 1.00	$ -	$ 13.80	$ 83.32	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,596.16	$ -	$ -	$ -	$ 1,498.04
	181	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,499.04	$ -	$ -	$ -	$ 1,498.04
	198	$ 1.00	$ -	$ 55.20	$ -	$ 175.00	$ 8.28	$ -	$ -		$ -	$ -	$ -	$ -	$ -	$ 239.48				$ 183.28
	115	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ -	$ 1,333.64		$ -	$ -		$ -		$ 1,342.92	$ -	$ -	$ -	$ 1,341.92
	208	$ 1.00	$ -	$ -	$ -	$ -	$ 8.28	$ 1,489.76	$ -		$ -	$ -		$ -		$ 1,499.04	$ -	$ -	$ -	$ 1,498.04
TOTALS		$ 17.00	$ 66.62	$125.86	$ 387.64	$ 175.00	$ 140.76	$14,897.60	$ 6,668.20	$ -	$ -	$ -	$ -	$ 709.46	$ -	$23,188.14	$ -	$ -	$ -	$ 22,591.02

$192.48 TOTAL LIFE PD BY EMPLOYEES

$ 209.48

TOTAL HEALTH INS PREMIUMS:	$22,275.26
TOTAL LIFE INS PREMIUMS:	$ 209.48
FLEX PMTS =	$ 387.64
TOTAL ADMIN FEES =	$ 140.76
WAIVER HEALTH INS:	$ 175.00
	$23,188.14

***Check to see if it says POSTED OR IN CLARIFICATION DOES NOT NEED TO SAY IN CLARIFICATION!!! IF SO-CALL KIM RICHEY!!!!

TOTAL BILL	$23,188.14
LESS FLEX	$ 193.82
NET TOTAL BILL	$22,994.32

1/2 FLEX:

J.ASHER	$ 41.75
JAMES	$ 110.41
ADAM	$ 41.66
TOTAL	$ 193.82

HEALTH INS PD BY PWW 4WK MO:		
ADMIN	$ 4,521.28	
WTP	$ 5,679.92	
WWTP	$ 3,557.70	
MAINT	$ 8,832.12	
	$ 22,591.02	TOTAL
INS/EMP	$ -	
L.INS/EMP	$ 192.48	
L.INS/PWW	$ 17.00	
FLEX	$ 387.64	
TOTAL	$ 23,188.14	

Exhibit PSC 3-7h

Lagoon Invoice

RESOURCE MANAGEMENT

103 Fieldview Drive
Versailles, KY 40383

8598733331

DATE	INVOICE #
8/26/19	PWS 19-08

BILL TO:

Mr. James Noel
Princeton Water and Wastewater
101 East Market Street
Princeton, KY 42445

P.O. NO.	TERMS	BILLING PERIOD	COMMENTS
None	30 Days Net	8/6/19 to 8/23/19	WTP Dewatering

VOLUME	DESCRIPTION	RATE	AMOUNT
320,072	Gallons Dewatered At Water Treatment Plant From Lagoon #1 From 8/6/19 to 8/14/19	0.087	27,846.26
326,671	Gallons Dewatered At Water Treatment Plant From Lagoon #2 From 8/15/19 to 8/23/19	0.087	28,420.38

Please make check payable to H&A Resource Management
1.5 % interest will be added to past due accounts

TOTAL $56,266.64

Exhibit PSC 3-7i

Energy Audit of WWTP

PSC 3-7i ENERGY AUDIT OF WWTP

Princeton, Kentucky WWTP

By:

Larry W. Moore, Ph.D., P.E.

University of Memphis Civil Engineering Department

In conjunction with:

The U.S. Environmental Protection Agency and Kentucky Department for Environmental Protection

August 2018

IMPORTANT NOTICE

The contents of this report are for general guidance only and are not intended to be a standard of the State of Kentucky. This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

No reference in this report to any specific method, product, process, or service constitutes or implies an endorsement or warranty by Dr. Larry W. Moore, the Kentucky Department for Environmental Protection (KDEP), State of Kentucky, or the U.S. Environmental Protection Agency (USEPA). This report reflects the best judgment of the author, but Dr. Moore, the State of Kentucky, KDEP, and the USEPA assume no

liability for implementation of the information contained herein. Anyone using this information assumes all liability arising from such use, including but not limited to infringement of any patent or trademarks and compliance with applicable state and federal regulations.

The information presented herein was developed jointly by Dr. Larry W. Moore, KDEP, and EPA. The field assessment of the Princeton Wastewater Treatment Plant was conducted on July 31, 2018.

Executive Summary

1. Overall, the facility is operated very well and is achieving its permit limits on a regular basis.

2. The team, in coordination with facility staff, identified approaches that could lead to significant cost savings and improved effluent quality at no capital expense. These approaches take advantage of excess capacity in order to:
    a. Reduce excessive aeration by strategically idling equipment
    b. Create low-oxygen environments to allow for enhanced biological nitrogen removal
    c. Reduce overall oxygen demand and improve effluent solids by reducing the population of bacteria in the system

3. The anticipated impacts from these changes are expected to include:
    a. Up to $36,000 per year in cost savings
    b. A reduction in effluent nitrogen of 64% (24 tons per year)
    c. Reduce electricity consumption by up to 336,000 kWh per year, enough to power about 31 homes.

I. Introduction

The City of Princeton owns and operates the Princeton wastewater treatment plant (WWTP). The Princeton WWTP has a *stated* design capacity, in accordance with NPDES Permit number KY0028401, to treat 1.57 Million Gallons per Day, or MGD, (average daily flow rate) of incoming municipal wastewater. The plant typically treats approximately 1.1 MGD (average daily flow rate) of weak-strength municipal wastewater.

The Princeton WWTP is an oxidation ditch process designed to achieve carbonaceous BOD and nitrogenous BOD removal. Preliminary treatment consists of coarse bar screening and horizontal flow grit removal. The plant currently uses all three oxidation ditches (each 0.535 mil gal in volume) and all three center-feed, peripheral-withdrawal clarifiers (0.25 mil gal each at approximately 60 feet diameter and 12 feet deep). The plant adds poly-aluminum chloride for phosphorus removal. Disinfection is achieved by chlorination. The final effluent is discharged via gravity into Eddy Creek.

Waste activated sludge is sent (usually one day per week) to four small unaerated sludge holding tanks (0.023 mil gal each) prior to being dewatered by belt filter press. Solids in the sludge holding tanks are allowed to settle for several days before supernatant is decanted and sent to the head of the plant. Dewatered sludge (about 15% solids) is transported to a landfill for final disposal.

Treated effluent is regulated by a NPDES Permit issued by the KDEP. This permit has non-seasonal effluent limits with the exception of seasonal limits for ammonia-N imposed from May through October (summer) and from November through April (winter).

The plant has had a generally good record of NPDES Permit compliance for the last several years. The oxidation ditches are operated at a very long solids retention time (SRT), which has contributed to settleability problems. However, plant effluent typically is of excellent quality because of final clarifiers that are conservatively designed, yielding very low surface overflow rates and solids loading rates as well as long hydraulic detention times.

An aerial view of the Princeton WWTP is shown below.

II. Performance of the Activated Sludge Treatment Process

Currently, the oxidation ditches are operating relatively well. Each oxidation ditch has two 40-hp fixed horizontal rotor aerators to satisfy the oxygen demand of the incoming wastewater and to provide mixing of the biomass. Under current conditions, all six 40-hp aerators are operated 12 hours per day (using timers), seven days per week and maintain very high dissolved oxygen levels and mixing in the three ditches. The dissolved oxygen (DO) concentration in the ditches is typically 3 to 6 milligrams per liter (mg/L). On the day of the plant visit, the oxygen uptake rate (OUR) in the ditches was about 0.1 mg/L/min. The specific oxygen uptake rate was about 2 mg/(hr-gram MLVSS).

The current raw wastewater characteristics for the Princeton WWTP are presented below and are based on actual average daily Discharge Monitoring Report (DMR) values for the past 59 months (June 2013 - April 2018) and estimated values for certain parameters. Mass values are based on the reported average daily flow DMR values for this period (1.1 MGD).

$CBOD_5$	=	130 mg/L (1190 lb/day)
TSS	=	150 mg/L (1380 lb/day)
Ammonia-N	=	24 mg/L (220 lb/day) [Estimated]
TKN	=	40 mg/L (370 lb/day) [Estimated]
Total P	=	6 mg/L (55 lb/day) [Estimated]

Above values were for all available data. Averages of the most recent 24 months (May 2016-April 2018 for flow rate of 1.03 mgd):

$CBOD_5$	=	145 mg/L (1250 lb/day)
TSS	=	190 mg/L (1630 lb/day)
Ammonia-N	=	24 mg/L (210 lb/day) [Estimated]
TKN	=	40 mg/L (340 lb/day) [Estimated]
Total P	=	6 mg/L (52 lb/day) [Estimated]

As shown by these raw wastewater data, the influent is weak-strength municipal wastewater. There is one significant industrial discharger (a cookie factory with anaerobic pretreatment) connected to the Princeton WWTP, and this industry could potentially contribute a significant organic load to the WWTP.

The current NPDES effluent limits for the Princeton WWTP are as follows. Limits are non-seasonal, except where indicated:

$CBOD_5$	=	20 mg/L (monthly average)
TSS	=	30 mg/L (monthly average)
Ammonia-N	=	4 mg/L (monthly average in summer)
Ammonia-N	=	10 mg/L (monthly average in winter)
Total P	=	1.0 mg/L (monthly average)

Over the past 24 months (July 2016 - June 2018) the average daily flow treated by the WWTP was 1.03 MGD. A flow rate of 1.1 mgd will be used in the evaluation of the WWTP at average conditions. The maximum daily flow rate reported for this same period was 4.6 MGD. (This was the peak recorded daily flow in the last 24 months. Over the last 59 months of available data, the value is 4.88 MGD, in March 2015.) For the purposes of this evaluation, the peak daily flow rate to the WWTP is estimated conservatively to be about 4.9 MGD.

The approximate operating conditions, based on actual operating data and information from Dr. Moore's biokinetic model, in the activated sludge process at this WWTP at the present time are provided below:

Total average daily flow rate	1.1 MGD
Aeration volume in service	1.6 mil gal
Aeration detention time	35 hours
Influent $CBOD_5$ concentration	130 mg/L
Influent $CBOD_5$ mass loading	1,190 lb/day
F/M ratio	0.025 lb BOD_5/(lb MLVSS-day)
Volumetric organic loading rate (VOLR)	5.6 lb BOD_5/(thousand cu ft-day)
Solids Retention Time	145 days
MLSS	5,000 mg/L
MLVSS	3,600 mg/L (estimated)
TSS Sludge Production	425 lb/day (intentional wastage)
TSS in activated sludge effluent	37 lb/day (unintentional wastage)
Total Oxygen Requirements (actual)	2,800 lb/day
Total Oxygen Requirements (design)	5,000 lb/day [at ave. daily Q = 1.57 mgd]
Total oxygen supplied (design)	5,200 lb/day (6 aerators @ 24/7; DO = 2.0)
Total oxygen supplied (actual)	2,800 lb/day (6 aerators @ 12/7; DO = 4.0)
Mixing intensity in 3 ditches (design)	150 hp/mil gal (6 aerators running)
Mixing intensity in 3 ditches (actual)	150 hp/mil gal (6 aerators running)
RAS flow rate (actual)	2.8 MGD
RAS recycle percentage (actual)	253%
WAS flow rate (actual)	0.007 MGD
RAS TSS concentration	7,000 mg/L
Total sludge production (sludge/eff solids)	460 lb/day (dry solids)

Under normal circumstances, the effluent produced by the Princeton WWTP will have the following characteristics.

$CBOD_5$	=	2 mg/L (18 lb/day)
TSS	=	4 mg/L (36 lb/day)
Ammonia-N	=	0.2 mg/L (2 lb/day)
TKN	=	1 mg/L (9 lb/day)
Total P	=	0.8 mg/L (7 lb/day)
Nitrite/Nitrate-N	=	21 mg/L (190 lb/day)
Total N	=	22 mg/L (200 lb/day)

The above model output compares extremely well with present plant performance. Hence, the accuracy of the biokinetic model is proven to be valid. The subsequent biokinetic model output described later in this report for alternative operating scenarios should likewise prove accurate.

Oxygen supplied by the aeration system of the activated sludge process can be estimated as follows:

Oxygen supplied ≈ 0.9 lb/hp-hr x 6 x 40 hp x 12 hr/day = 2600 lb/day (DO ≈ 4 mg/L)

Horsepower needed for mixing is 50 hp per mil gal.

Actual mixing intensity = 240 hp ÷ 1.6 mil gal (six aerators running in the ditches)
= 150 hp/mil gal (adequate)

Typical 30-minute settleability values are relatively poor, ranging from 700 to 900 mL/L because of the old age of the biomass. A diluted settleometer (50/50 mixed liquor and effluent) was performed on the day of the plant visit, and the 30-min settleability value was 250 mL/L. These values indicate the solids inventory is too high, causing a glutted system. Moreover, because of the present relatively poor sludge settleability, the plant must maintain a relatively high RAS rate to keep the sludge blanket down and keep biomass from accumulating to problematic levels in the final clarifiers. ***Thus, process performance would improve if MLSS was reduced***. The supernatant in the diluted sample was observed to be cloudy, but that is the result of a very old sludge. When the MLSS concentration is reduced, the sludge age will decrease and the cloudiness should not be an issue.

The volume of each clarifier is about 0.25 MG. Thus, the following calculations are based on a clarifier diameter of 60 feet and a depth of 12 feet.

Current loadings on the three final clarifiers are:

Surface overflow rate (SOR) at average flow = 130 gpd/ft^2 (good)

Peak SOR = 580 gpd/ft^2 (acceptable at a peak daily flow rate of 4.9 MGD)

Detention time at average flow = 16 hours (very long)

Detention time at peak daily flow rate = 3.7 hours (good)

If only two final clarifiers are used, the loadings on each clarifier are as follows:

SOR at average flow rate = 195 gpd/ft^2 (good)

Peak SOR = 765 gpd/ft^2 (acceptable at a peak daily flow rate of 4.9 MGD)

Detention time at average flow = 11 hours (long)

Detention time at peak daily flow rate = 2.5 hours (acceptable)

The waste activated sludge (WAS) flow rate is about 7,000 gpd (average) according to the Bio-Tiger Model. Typically, sludge is wasted from the process one day per week, and the volume wasted will be about 25,000 gallons. (Note that the reported average WAS volume is only 3,600 gpd). The sludge is dewatered to about 15% solids using a belt filter press. Final sludge disposal presently occurs at a nearby municipal solid waste (Subtitle D) landfill.

III. Electrical Energy Consumption

Flow, kWh and electrical cost data were provided by the facility. For the last 12 months (July 2017 - June 2018), the average energy use by this WWTP was about 92,000 kWh per month at a cost of $11,000 per month ($0.12 per kWh). Current aeration energy use is estimated to be 61% of the total energy use or 56,000 kWh per month. See the calculation below (assuming the aerator motors are drawing 87% of full motor load):

Aeration
Energy use = 40 hp x 6 units x 12 hr/day x 0.75 kW/hp x 0.87 x 30 days/mo = 56,000 kWh/mo

For an average daily flow rate of 1.1 mgd, the electrical energy use for this plant is about 2,800 kWh per million gallons of wastewater treated. For a typical activated sludge WWTP operating in the extended aeration mode, the average energy use is expected to be about 2,700 kWh per million gallons of wastewater treated. Therefore, the Princeton WWTP appears to be about average for a typical extended aeration activated sludge plant in terms of overall energy consumption. However, in terms of organic strength, an extended aeration activated sludge

WWTP would be expected to use 1.6 kWh per pound of BOD_5 removed. The electrical energy use for the Princeton WWTP is estimated to be about 2.5 kWh per pound of BOD_5 removed (56% higher than the typical extended aeration activated sludge plant). Therefore, there are opportunities for energy conservation at this WWTP.

The allocation of energy use at a typical extended aeration activated sludge WWTP would be expected to be as follows:

Raw wastewater pump station	5.5%
Headworks	0.5%
Aeration system	60%
Secondary clarifiers/RAS	9.7%
Thickener/pumps	1.9%
Utility water	3.4%
Solids dewatering	6.9%
Heating/air conditioning	7.0%
Lighting	2.2%
Disinfection/post aeration	2.9%

Hence, based on both biokinetic modeling and historical power data, and in comparison to other wastewater plants treating a similar domestic waste load, it appears that the Princeton WWTP is using its aeration equipment more than necessary to satisfy the oxygen demand imposed on the WWTP.

IV. Natural Gas Consumption

There is minimal natural gas use at the Princeton WWTP.

V. Potential Energy Conservation Measures

For the Princeton WWTP, the primary way to save money on electrical charges is to reduce energy consumption via implementation of revised operator control, thereby using fewer kWh of electricity. This goal can be achieved by turning "off" electrically powered equipment or running large motors at reduced speed. The oxidation ditch aerator motors use about 61% of the total electrical energy consumed in the facility. The overall cost of electrical energy for this plant is about $0.12 per kWh. Thus, a typical electric bill for the Princeton WWTP is about $11,000 per month.

There appears to be some potential for energy savings to be achieved in the operation of the oxidation ditch aerators. The primary reason for this is that the final effluent has about 540 lb/day of equivalent oxygen in the nitrate-N (190 lb/day) that is being discharged in the final effluent. Moreover, the actual average DO in the aeration tanks is reported to be typically in the range of 4.0 to 5.0 mg/L. Operating at a DO concentration of 4.0 mg/L effectively reduces the oxygen transfer rate of the aerators approximately 40%. Because the equivalent oxygen in the effluent nitrate-N represents about 20% of the oxygen needed in the three oxidation ditches, on-off operation of the aerators appears to be feasible.

The following operating scenarios are presented as potential energy saving alternatives for the Princeton WWTP:

A. Operating the WWTP to Achieve Nitrification and Denitrification (Anoxic zone throughout the ditch)

The dissolved oxygen (DO) level in each oxidation ditch reportedly varies from a low of 4.0 mg/L to a high of 6.0 mg/L with two fixed horizontal aerators operating at full speed. This range of DO is much more than what is needed or recommended. Additionally, the effluent nitrite/nitrate-N levels have averaged about 21 mg/L for the past 12 months. This level of nitrate represents potential energy savings because this nitrate will be a substitute for oxygen during times when both aerators in each ditch are turned "off" and the system is operating in the anoxic mode. The 21 mg/L nitrate is equivalent to 60 mg/L of oxygen, but this substitute for oxygen is only available when the aerators are turned "off" and the oxygen levels in the oxidation ditches are allowed to drop to zero. [In fact, denitrification will begin to occur when DO falls below 0.3 mg/L.] At zero DO, the facultative bacteria are forced to use the nitrate for energy metabolism. Taking advantage of anoxic operation will not only save energy but also will substantially reduce the amount of nitrate-N discharged to the receiving stream. Anoxic operation allows alkalinity recovery and should improve overall effluent quality.

As the aeration system operates now, the DO is not allowed to go to 0.0 mg/L. We suggest adjusting the target DO range as follows during the time that the aerators are operating:

Low DO target	1.0 mg/L
High DO target	2.0 mg/L

When the aerators are turned off, the DO concentration will decrease to 0.0 mg/L in 20 to 60 minutes. During the time, the basins have less than 0.3 mg/L of DO, the facultative heterotrophic bacteria will use nitrate-N and nitrite-N as their terminal electron acceptor and convert them to nitrogen gas. The aerators may be turned off manually for one extended cycle per day.

Specifically, the aerator run times should be modified to allow the DO to stay at about 0.0 mg/L for a total of 4 to 8 hours/day. For example, if the aerator is turned off once per day, the DO could be allowed to drop to 0.0 mg/L and stay at 0.0 mg/L for about 6 hours to promote significant denitrification. The best time to implement this practice may be from midnight to 6:00 a.m. or 6:00 a.m. to noon. The latter option may achieve more denitrification because the diurnal peak load would supply more carbon. There should be no concerns about the adverse impact of turning the aerator motors off and on because this is being done already with timers.

Dr. Moore is familiar with several extended aeration activated sludge plants that practice aerator on-off operation to achieve denitrification. In the nitrification mode (i.e., as the plant currently operates), the typical effluent Total N concentration is about 15 to 25 mg/L and is often higher than 20 mg/L. In the nitrification/denitrification mode, typical effluent Total N concentration will be about 6 to 10 mg/L.

Operating the plant to achieve denitrification will reduce the average nitrate/nitrite-N value from the present level of 21 mg/L to about 7 mg/L. The reduction in oxygen requirements from operating in the dentrification mode can be estimated as follows:

Oxygen equivalent of denitrification = 14 mg/L x 1.1 MGD x 8.34 x 2.86 lb O_2/lb NO_3-N
= 370 lb/day

Thus, by this alternate operating strategy, denitrification will provide about 13% of the overall oxygen demand on the plant. This scenario should reduce the run time of six aerators by about 4 hours per day, which should reduce electrical energy consumption by about 9,300 kWh per month. This will reduce the electric bill by about 7%. At the marginal cost of $0.12/kWh, this amounts to about $1100 per month. This does not include any potential savings from reduction in peak electricity demand that could be achieved coincidentally.

As described above, it is conceivable that the aerators could be turned off for up to 6 hours per day because the effluent nitrite/nitrate-N values are occasionally higher than the 12-month average value of 21 mg/L. When the available nitrate levels are higher, the WWTP can extend the aerator "off" time for to up to 6 hours, saving additional energy costs. Based on the analysis presented herein, turning off the aerators for about 6 hours per day is a conservative energy savings measure that appears warranted for nominal, everyday operation.

In addition to oxygen recovery, turning the aerators off for four to six hours per day should reduce the effluent nitrite/nitrate-N concentrations from about 21 mg/L to about 7 mg/L. The effluent Total N concentration will be reduced from about 22 mg/L to about 8 mg/L. *While this shift may not seem to have a huge impact, it should reduce the Total N discharged to Eddy Creek by 64 % or 24 tons per year.* This decrease would be a commendable and significant reduction in

nitrogen loading from this WWTP. Princeton would be able to consider this success as part of its long-term nutrient reduction goals.

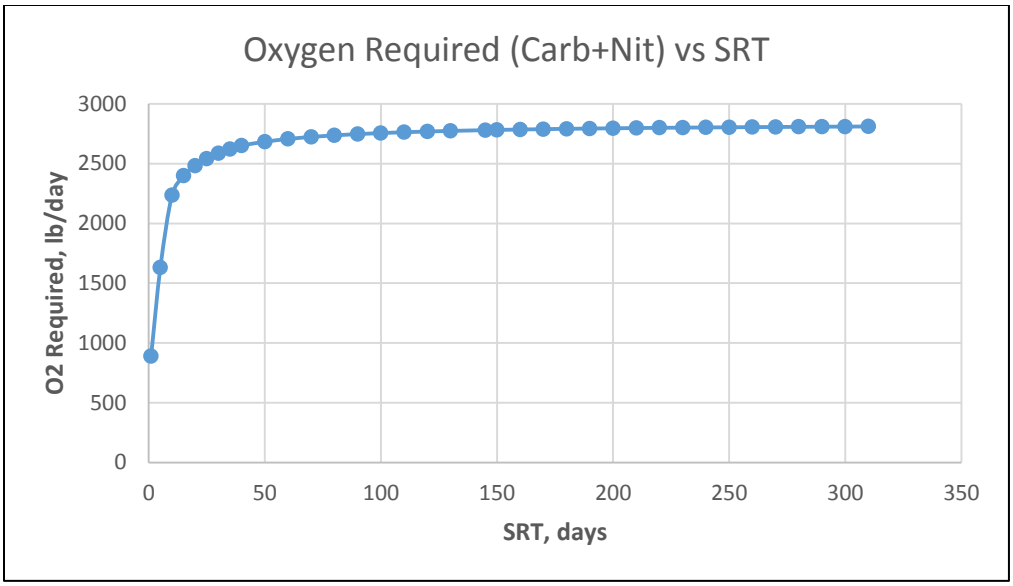
Operating the plant under this optimized denitrification energy operating scenario, the effluent is expected to have the following characteristics:

$CBOD_5$	=	3 mg/L (28 lb/day)
TSS	=	5 mg/L (46 lb/day)
Ammonia-N	=	0.4 mg/L (4 lb/day)
TKN	=	1.0 mg/L (9 lb/day)
Total P	=	0.7 mg/L (6 lb/day)
Nitrite/Nitrate-N	=	7 mg/L (64 lb/day)
Total N	=	8 mg/L (73 lb/day)

Thus, operating the plant in the denitrification mode offers significant improvements to overall effluent quality. CBOD, TSS, and Ammonia-N will increase marginally but would not risk the chance of NPDES permit violations.

B. Operating the WWTP with Two Ditches and Operating at a Lower Solids Retention Time with Nitrification/Denitrification

In this option, two oxidation ditches will be operated at a lower Sludge Retention Time (SRT) to enhance sludge settleability and to reduce oxygen requirements of the biomass. The current SRT is about 145 days, which is much longer than necessary to achieve excellent effluent quality. By reducing SRT to about 40 days (with nitrification/denitrification), the oxygen requirements for the activated sludge process will be reduced from 2,800 lb/day to 2,200 lb/day (21% reduction). The impact of SRT on oxygen requirements (with nitrification but no denitrification) for the Princeton WWTP at current organic and oxidizable nitrogen loadings is shown below:



Oxygen demand with denitrification & lower SRT = 2,800 – 600 = 2,200 lb/day

With this operating scenario, it is recommended that each aerator in each ditch run 9 hours per day, but only one aerator will run at a time. In other words, 40 hp of aeration in each of the two ditches will be running for 18 hours per day, and both aerators will be off for 6 hours per day to create anoxic conditions for achieving denitrification. The estimated operating DO concentration will be 1.5 to 2 mg/L when the aerator is running in each of the two ditches.

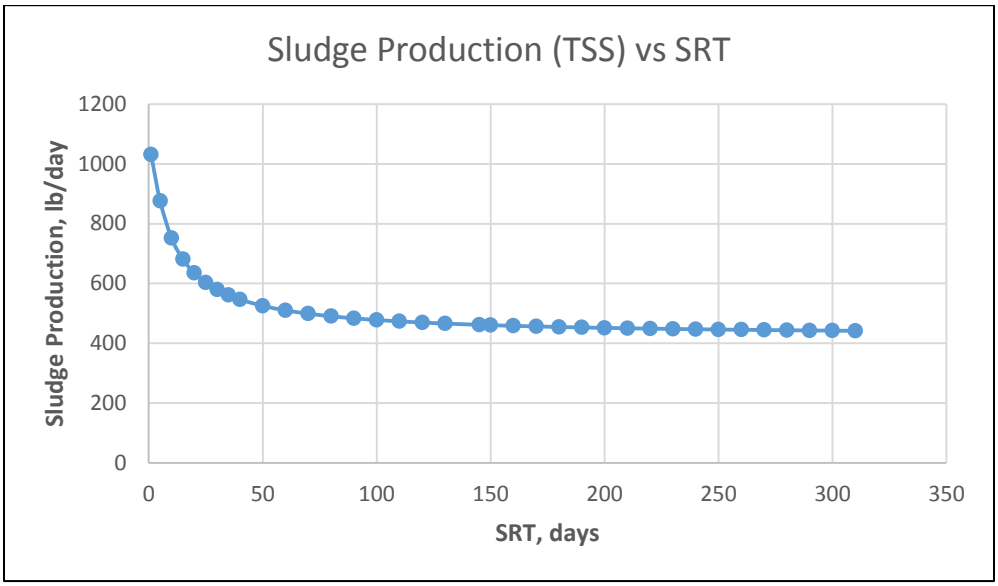
Oxygen supplied ≈ (80 hp x 18 hrs) x 1.5 lb/hp-hr = 2200 lb/day

This is an estimate, and the operators will need to adjust the run time for each aerator so that the DO concentration of 1.5 to 2 mg/L will be achieved for about 18 hours per day. Energy savings are calculated as follows:

Energy savings ≈ 80 hp x 6 hrs x 0.75 kW/hp x 0.87 x 30 days/mo
+ 80 hp x 12 hrs x 0.75 kW/hp x 0.87 x 30 days/mo
= 28,000 kWh/mo

The energy savings with this option (28,000 kWh/mo) will provide cost savings of about $2,400 per month. If monthly peak electric demand is reduced by idling 80 hp of aeration, an additional $780 per month is possible. Denitrification efficiency and energy savings will fluctuate based on influent organic and oxidizable N loadings, ambient conditions, oxidation ditch operating parameters, and other factors. The primary control in this option is the hours of operation of each aerator. One aerator running at a time should provide enough oxygen and adequate mixing in each of the two ditches.

With this option the WAS production rate will increase from about 425 lb/day (currently) to about 500 lb/day. Thus, sludge production will increase approximately 18% by changing the SRT from 145 days (currently) to 40 days (proposed in this option). The impact of SRT on the total solids production rate (WAS solids + effluent solids) for the Princeton WWTP at current organic and oxidizable nitrogen loadings is shown below:



A revised biokinetic model analysis has been prepared for operating the plant at a lower SRT. For an SRT of 40 days and using only two oxidation ditches, the biokinetic model indicates that plant operating parameters will be approximately as follows:

Total average daily flow rate	1.1 MGD
Aeration volume in service	1.07 mil gal
Aeration detention time	23 hours
Influent $CBOD_5$ concentration	130 mg/L
Influent $CBOD_5$ mass loading	1,190 lb/day
F/M ratio	0.074 lb BOD_5/(lb MLVSS-day)
Volumetric organic loading rate (VOLR)	8.3 lb BOD_5/(thousand cu ft-day)
Solids Retention Time	40 days
MLSS	2,500 mg/L
MLVSS	1,800 mg/L (estimated)
TSS Sludge Production	490 lb/day (intentional wastage)
TSS in activated sludge effluent	55 lb/day (unintentional wastage)

Total Oxygen Requirements (actual)	2,200 lb/day (with denitrification)
Total Oxygen Requirements (design)	5,000 lb/day
Total oxygen supplied (design)	5,200 lb/day (6 aerators running 24/7)
Total oxygen supplied (actual)	2,200 lb/day (4 aerators running 9/7)
Mixing intensity in both ditches (design)	150 hp/mil gal (4 aerators running)
Mixing intensity in both ditches (actual)	75 hp/mil gal (2 aerators running)
RAS flow rate (actual)	0.6 MGD
RAS recycle percentage (actual)	54%
WAS flow rate (actual)	0.008 MGD
RAS TSS concentration	7,000 mg/L
Total sludge production (sludge/eff solids)	550 lb/day (dry solids)
Effluent ammonia-N	0.5 mg/L

One way to gradually implement this option is as follows:

September 2018	Maintain MLSS ≈ 4200 mg/L; run each aerator 10 hrs/day (3 ditches)
October 2018	Maintain MLSS ≈ 3400 mg/L; run each aerator 10 hrs/day (2 ditches)
November 2018	Maintain MLSS ≈ 2500 mg/L; run each aerator 9 hrs/day (2 ditches)

Under this alternative optimized energy operating scenario, the effluent is expected to have the following characteristics:

$CBOD_5$	=	3 mg/L (28 lb/day)
TSS	=	6 mg/L (56 lb/day)
Ammonia-N	=	0.5 mg/L (5 lb/day)
TKN	=	1.5 mg/L (14 lb/day)
Total P	=	0.7 mg/L (6 lb/day)
Nitrite/Nitrate-N	=	7 mg/L (64 lb/day)
Total N	=	8 mg/L (73 lb/day)

Thus, operating the plant in this mode, with lower SRT and denitrification, offers significant improvements to overall effluent quality. CBOD and Ammonia-N will increase marginally from their present values but would not risk the chance of NPDES permit violations. Operating with a lower SRT offers better effluent reliability by improving mixed liquor settleability and by reducing solids loadings on the final clarifiers. This reduced solids loading decreases the potential for short-term flow spikes to impair effluent quality. *If using only one aerator in each of the two ditches does not provide adequate mixing or oxygen levels, two aerators should be run*

simultaneously for a few hours each day to put nearly all solids in suspension and to increase DO levels during periods of high organic and oxidizable N loadings.

Lighting

The facility had fluorescent lighting in most occupied buildings and dusk-to-dawn outdoor lighting. The cost of LED tubes to replace fluorescent has dropped significantly. LED tubes use about half the energy of a T12 fluorescent tube. Simply replacing four 48" fluorescent tubes with four LED tubes will cut energy costs in half, but it will take about 2.5 years to recover the added cost of the LED tubes. However, because the LED's do not require a ballast, replacing fluorescent tubes with four LED tubes when a ballast goes bad only requires about a year to recover the added cost. In addition, LEDs have a much longer lifespan. Each replacement decreases the labor and expense of replacing bulbs. If LED lights are used throughout the WWTP, the energy savings are expected to be about 400 kWh per month or $50 per month.

VI. Conclusions and Recommendations

1. The Princeton WWTP is currently doing a relatively good job of operating its treatment system efficiently in terms of electrical energy use. This is indicated by the fact that the plant is using about 2,800 kWh/mil gal of wastewater treated, which is 4% more than a typical extended aeration activated sludge plant. However, because this WWTP has a significant amount of nitrite/nitrate-N in its effluent, energy savings can be achieved by modifying the operational procedures of this plant.

2. The WWTP is producing excellent effluent quality and reliably satisfies all its NPDES discharge requirements. Plant operational procedures are sound, and the operations staff is to be commended for achieving excellent plant performance.

3. Princeton can achieve significant energy savings by implementing a couple of recommended alternative operating strategies. The first suggested alternative involves turning all aerators off for 4 to 6 hours per day to reduce aeration requirements and to promote denitrification in the activated sludge process. By implementing this energy savings measure, *the Total N discharged to Eddy Creek will be reduced by about 24 tons per year, or 64%*. **Total energy use will be reduced by about 10% and is estimated to achieve an energy cost savings of $800 per month for this simple control modification**.

4. The second suggested alternative offers greater energy savings and has the potential to improve final clarifier reliability and overall performance. Operating the WWTP with two ditches at a reduced MLSS concentration (2,500 mg/L), two aerators running 18/7 will create an anoxic zone throughout each ditch for about 6 hours per day. This shift will promote significant denitrification. This option also includes changing the SRT from 145 days (currently) to about 40 days (proposed) to reduce oxygen requirements about 21% (including denitrification). In this option, the operators will need to control the daily run time of each aerator to create and maintain anoxic conditions in each of the two ditches. By implementing this energy savings measure, *the Total N discharged to Eddy Creek will be reduced by about 24 tons per year, or 64%*. This should result in energy savings of about 28,000 kWh per month. **Total plant energy use will be reduced by about 30% and is estimated to achieve an energy cost savings of $2,400 per month.**

5. As fluorescent tubes need replacing, use LED tubes as the replacement especially if ballasts need replacing. If possible, replacement all at once leads to more immediate reductions in energy use and produces notable energy savings. With all LED lighting, energy savings will be about $600 per year.

6. Continue to maintain an energy saving culture within the facility where employees are always looking for ways to reduce usage, demand, and energy costs.

7. Several belt-driven motors were observed during the visit. If the motors are driven by V-belts, the facility should consider replacing them with notched belts. The notched belts produce less heat, which improves efficiency and reduces maintenance. Motor efficiency gains of between 2-7% can be expected. Gains at the higher end of the range can be expected if the tension of the existing V-belts is not routinely adjusted every 3-6 months.

Exhibit PSC 3-7i

Initial Recommendations

PSC 3-7I INITIAL RECOMMENDATIONS

City of Princeton Waste Water Treatment Plant

November 13, 2017

Kentucky Rural Water Association

Princeton Wastewater Treatment Plant Energy Assessment

November 2017

Energy Efficiency Program Overview:

The Kentucky Rural Water Association (KRWA) has implemented a program to assist water and wastewater utilities to evaluate and lower their energy consumption and costs. This energy efficiency assessment considers current and past energy use, identifies the primary energy consuming components, and identifies methods to lower energy use and costs.

This program works with the local power companies to determine if the water and/or wastewater utility is eligible for available incentives, or reduced rate structures. This service program is available at no charge and participants are not obligated to implement the recommendations. However, implementation will be strongly encouraged.

System Description:

The City of Princeton wastewater system has 2,921 wastewater connections which serves an approximate population of 6,255 and has a Median Household Income (MHI) of $37,579. The energy efficiency assessment will encompass the wastewater treatment plant. The collection system is comprised of 157 manholes, 6 lift stations, approximately 309,650 Linear Feet (LF) of sewer lines of which 97% is greater than 20 years old.

Princeton Wastewater Treatment Plant (WWTP) treats on an average 0.903 million gallons per day (MGD) of low-strength wastewater. The design capacity of this wastewater treatment plant is 1.57 MGD. The plant effluent is discharged by gravity flow into Eddy Creek under KPDES permit number KY0028401.

Under normal conditions wastewater is pumped from the primary sewer pump station to the headworks of the WWTP. The wastewater then flows into three oxidation ditches and each oxidation ditch is aerated with two 40 horse power (HP) surface aerators.

Effluent flows from the oxidation ditches into a center fed, circular clarifier. The processed wastewater flows into the chlorine contact chamber where chlorine is introduced for the disinfection of the plant effluent. The disinfected effluent flow is discharged into Eddy Creek.

Energy Efficiency Observations/Opportunities:

For the period July 2016 through June 2017, the Princeton wastewater treatment plant treated 351.537 million gallons of wastewater; used 1,131,000 kWh; spent $147,300 for electricity; average energy cost was $0.42 per 1000 gallons treated; and the electric utilization was 3.22 kWh/1000 gallons treated.

The Princeton Electric Board is the energy provider for the City of Princeton Wastewater Treatment plant.

A Dissolved Oxygen concentration of 1.0 mg/L to 2.0 mg/L is generally sufficient to maintain stable biological activity in an activated sludge process with nitrification. Not only are concentrations above this range unnecessary, but they also cause the aerators to operate less efficiently due to lower oxygen diffusivity at higher concentrations. For example, at 20 Degrees C, increasing the Dissolved Oxygen from 1.0 mg/L to 4.0 mg/L will reduce oxygen transfer efficiency by 40%.

To assist with maintaining the Kentucky Pollutant Discharge Elimination System (KPDES) permit limits, plant personnel could use the on-off aeration method to save on energy costs and achieve biological nutrient removal. Turning off the aerators intermittently throughout the day creates anoxic conditions (an absence, or near absence of oxygen), this allows the facultative bacteria in the mixed liquor to utilize nitrate in lieu of oxygen as an electron donor. The bacteria continue to oxidize organic matter, converting the nitrate to nitrogen gas which is released into the atmosphere.

Energy Efficiency Recommendations:

Wastewater Treatment Plant:

Recommendation #1: Install Variable Frequency Drives (VFDs) on all aerators and operate at approximately 85% of full rotational speed. This will result in a **reduction of 283,000 kWh** and **save the City of Princeton approximately 25% ($36,800) annually**

The cost of the VFDs is estimated at $32,000 or a .85 year pay-back period.

Recommendation #2: Shut off each aerator blower for 4 hours each day, in 2 hour stretches. This not only lowers the effluent total nitrogen but also provides added benefit of electrical cost savings. The estimated annual electrical savings is **188,400 kWh** and a cost savings of **$24,500**. Because there are no costs to turning the aerators off the payback is immediate.

The two recommendations above could be implemented gradually as the plant staff finds beneficial. There is no reason to believe that by reducing the speed of the aerators, or shutting off the aerators for 4 hours per day should cause an effluent violation. However, the operations staff should be attentive to the effects of the changes, particularly as it relates to effluent ammonia. Nitrification rates will decrease with lower Dissolved Oxygen concentrations and effluent ammonia may increase slightly. Continued compliance is the primary reason changes should be made in small increments to the treatment process.

Recommendation #3: The investment in monitoring equipment and control equipment (such as; aeration timers for automatic on-off operation of the aeration equipment, and luminescent Dissolved Oxygen probes to help in maintaining a constant Dissolved Oxygen level) would aid the operations staff in finding additional savings at the treatment plant.

Recording the electrical energy meter readings in a daily log book is highly recommended. This will assist in monitoring the actual recommended energy savings. Also, consider the purchase of an electrical

multimeter to aid in making monthly or bi-monthly recording of the amps, voltage and ohms of the electric motors. This could be a forewarning of impending failure of the motors.

Recommendation #4: Typically, during site visits we suggest that utilities consider a LED lighting replacement program in areas where conventional lighting is used as the energy consumption can be significantly less. As an example, if you replace a 40-watt incandescent bulb with a 7-watt LED replacement (same lumen output) and operate the light 8 hours/day/5 days/week/year at $.0.13/kWh the electricity savings would be 88%.

The fact that there are approximately 260 fluorescent bulbs in use, we recommend replacing these lights with LED lights.

Potential Saving for the light conversion to LED:
Total – Projected Expense = $2,000
Projected Savings = $**2,300**
Projected kWh savings= **17,851**
Payback Period = .86 years

By implementing the above recommendations, the City of Princeton could potentially **save over 50%** in energy costs.

Recommendation #5: The City of Princeton should meet with its energy provider to check on rebates associated with the energy efficient upgrades made to the facilities.

Funding Possibilities:

DSIRE www.dsireusa.org is the most comprehensive source of information on incentives and policies that support renewables and energy efficiency in the United States. It is funded by the Department of Energy. Currently there are over 81 programs listed for Kentucky.

USDA, Rural Development www.rd.usda.gov provides financing for water, wastewater, solid waste, and storm water facilities for a number of purposes including but not limited to energy efficiency improvements.

National Rural Water Association (NRWA) – has a Rural Water Revolving Loan Fund specifically designed to meet the needs of water and wastewater systems. NRWA established a new emphasis on energy efficiency projects that improve water and/or wastewater system sustainability through lower energy costs. There are no administrative or processing fees involved with this loan program.

Key Points:

1) Low interest rate (currently 3%)
2) $100,000 maximum or 75% of project cost, whichever is less
3) Maximum 10 year term
4) Quick turnaround, generally only a few days from application to funding

www.nrwa.org/initiatives/revolving-loan-fund/ for more information

Conclusion

The Kentucky Rural Water Association would like to thank the City of Princeton for the opportunity to provide this Energy Efficiency Assessment Report. The staff was kind and very helpful; it was a pleasure working with them. Should the City of Princeton have any questions or concerns please contact our office at 270-843-2291 or email j.pennell@krwa.org.

City of Princeton

	Pre Assessment	Post Assessment	Savings
Total Energy Consumption (kWh)	1,131,000	642,059	488,941
Current energy rate ($)	0.13	0.13	0
Total Energy Costs ($)	$147,030.00	$83,467.67	$63,562.33

Project Item	Energy Conservation Measure Description	Annual Energy Savings (kWh)	Annual Cost Savings ($)	Estimated Cost of Improvement ($)	Rebate Total ($)	Payback (Years)
1	VFD	282750	$36,757.50	$32,000.00	$0.00	0.87
2	Aerator Timers	188,340	$24,484.20	0.00	$0.00	0.00
3	LED Lights	17,851	$2,320.63	$2,000.00	$0.00	0.86
		488,941	$63,562.33	$34,000.00	$0.00	0.53

Exhibit PSC 3-7i

Emails on Energy Audit

Gmail by Google

James Noel <jamesnoel@princetonwater.com>

Draft Energy Report for the Princeton KY WWTP

8 messages

Larry W Moore (lwmoore) <[redacted]> Tue, Aug 28, 2018 at 4:15 PM
To: "williambrown@princetonwater.com" <williambrown@princetonwater.com>, "jamesnoel@princetonwater.com" <jamesnoel@princetonwater.com>
Cc: [redacted]>

William & James:

Attached is our draft report for your plant. Please review it carefully and let me know if any changes need to be made. I hope that you will be willing to implement some of these recommended changes to your plant operation.

I understand that you are already turning all aerators off for about 4 hours each day. That is great! When you have some energy data and effluent Total N and Total P data for on-off aerator operation, we would be anxious to see the data.

I am very confident you can run the plant with only two oxidation ditches and at a MLSS concentration of 2500 mg/L. The SRT will be about 40 days, and with on-off aerator operation, your oxygen requirements will be reduced about 21%. Moreover, sludge settleability should be significantly better. Overall, effluent quality should also be better. With this mode of operation, your energy savings will be about 30%.

Thanks for allowing us to conduct the energy assessment at your plant. We really appreciate your cooperation.

Sincerely,

Larry

Larry W. Moore, Ph.D., P.E.

Professor Emeritus

Civil Engineering Department

3815 Central Avenue

University of Memphis

Memphis, TN 38152

901-678-3278 office

901-678-3026 fax

[redacted]

Princeton KY WWTP Energy Audit Report Draft RBH comments revised 082818.docx
1158K

William Brown <williambrown@princetonwater.com> Fri, Aug 31, 2018 at 12:18 PM
To: "James A. Noel" <jamesnoel@princetonwater.com>

This is the response I sent to Prof. Moore, just to keep you in the loop. As of this morning, I've set the timers to turn off the aerators from midnight to 6 am. I also staggered each ditch by 5 minutes as Dr. Collier suggested so they won't peak out the amperage when they kick back on.

---------- Forwarded message ---------
From: **William Brown** <williambrown@princetonwater.com>
Date: Wed, Aug 29, 2018, 8:17 AM
Subject: Re: Draft Energy Report for the Princeton KY WWTP
To: Larry W Moore (lwmoore) [redacted]>

Prof Moore,

Good morning and thank you for the report. Jesse told me you spoke on the phone with him yesterday. To answer some of your questions, since adjusting the aerators to turn off 4 hours a day, our average nitrogen removal for the last two weekly testing cycles has been an average of 36.5%. In the two months previous, the removal average was about 27%. There has been no significant increase in our effluent CBODs or ammonia. A positive side effect is a perceptible die off of algea in the clarafiers, which makes them easier to clean and frees up man hours.

We are currently attempting to lower our MLSS, but the low settleability of the mixed liquor is slowing the process down. We are pressing sludge as fast as we can fill our basins, but the MLSS is still hovering around 6000. I have set the aerators to shut off from 3pm to 8pm as having them off in the morning was also hindering our wasting volume. As you suggested in the port, I will may set the off time from midnight to 6am as that is optimal for our process.

As I generate more long term data I will share it with you. Thank you and your team for your help.
[Quoted text hidden]

James Noel <jamesnoel@princetonwater.com> Fri, Aug 31, 2018 at 12:30 PM
To: William Brown <williambrown@princetonwater.com>

Looks great! I definitely appreciate the amount of professionalism you put into your emails.

If you would like for me to create any spreadsheets to track your data easier just let me know.
Thanks,
[Quoted text hidden]

James Noel <jamesnoel@princetonwater.com> Sun, Sep 9, 2018 at 3:16 PM
To: Ricky Oakley <[redacted]>

Ricky,
Forwarding you the energy report I was telling you about.
Thanks,
[Quoted text hidden]

Princeton KY WWTP Energy Audit Report Draft RBH comments revised 082818.docx
1158K

Ricky Oakley <ricky.oakley@hdengr.com> Mon, Sep 10, 2018 at 1:54 PM
To: James Noel <jamesnoel@princetonwater.com>
Cc: [redacted]

It's a good report and I would never take exception to a recommendation of Dr. Moore's. However, I don't think I would want to take 3rd ditch out of service. If you start turning rotors off, I recommend rotating them to try to keep

MLSS moving.

For example:

Night time operation,

Ox Ditches 1, 2 and 3,

Rotor 1 “Off” in each from 10 PM to 12 AM, Rotor 2 “On”;

Rotor 2 “Off” in each from 12 AM to 2 AM, Rotor 1 “On”;

Rotor 1 “Off” in each from 2 AM to 4 AM,

Rotor 2 “Off” in each from 4 AM to 6 AM, Rotor 1 “On”;

All Rotors “On” from 6 AM to 10 PM,

To do this I recommend PWW should install timers for automatic control and adjustment and a DO Probe.

Ricky

PS – You may remember, our plan was similar but it did cost more. We were changing drives to VFDs to control speed and adding a mixer to limit oxygen w/out losing horizontal velocity. A DO probe/meter would control the speed of the drives.

[Quoted text hidden]

James Noel <jamesnoel@princetonwater.com> Mon, Sep 10, 2018 at 4:57 PM
To: Ricky Oakley <[redacted]>
Cc: Cory Borum <[redacted]>

Thanks for the info.
[Quoted text hidden]

James Noel <jamesnoel@princetonwater.com> Mon, Sep 10, 2018 at 5:00 PM
To: William Brown <williambrown@princetonwater.com>

FYI
I shared the energy report with Ricky Oakley I'm forwarding his response.
Thanks,
[Quoted text hidden]

Held, Brendan <[redacted]> Fri, Feb 8, 2019 at 12:06 PM
To: "williambrown@princetonwater.com" <williambrown@princetonwater.com>, "jamesnoel@princetonwater.com" <jamesnoel@princetonwater.com>

William and James,

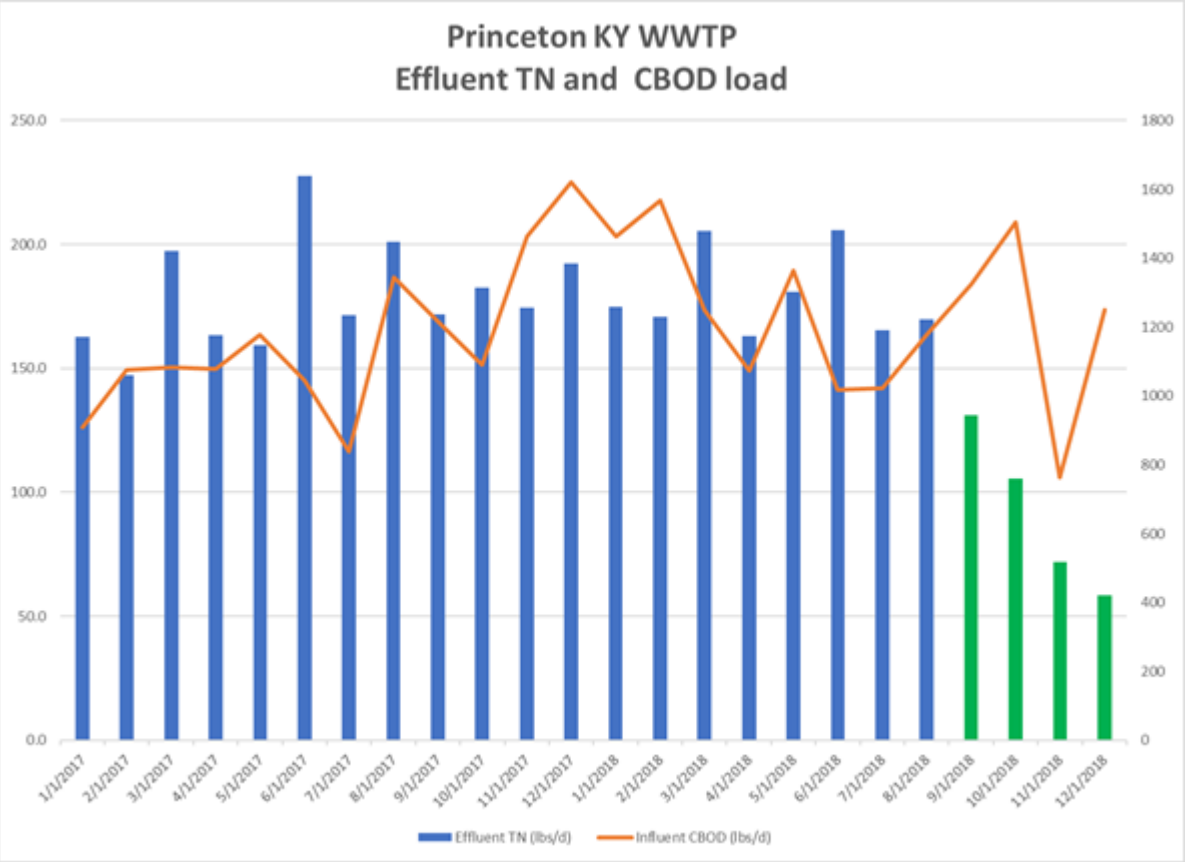
How are things going with the new aeration schedule? It looks like the TN numbers have really improved, at least through December 2018. I graphed the effluent TN (blue/green bars) alongside influent CBOD (orange line) to show that it isn't just a reduced load to the plant. Have you noticed a change in your electric bills? If you want to send the bills over, I'd be happy to analyze them if you haven't had the chance. The most recent bill I have is from June 2018.

If you have time to chat next week, it would be great to catch up. I'm hoping to talk with KDCA soon to discuss our plans for workshops and some other items, so we should have an update for you on that front soon.

Call anytime,

Brendan

[redacted]



From: Larry W Moore (lwmoore) <[redacted]>
Sent: Tuesday, August 28, 2018 5:15 PM
To: williambrown@princetonwater.com; jamesnoel@princetonwater.com
Cc: Held, Brendan <[redacted] Colliver, Donald [redacted]>
Subject: Draft Energy Report for the Princeton KY WWTP

William & James:

[Quoted text hidden]

Exhibit PSC 3-7j

AJE Capital Labor

Princeton Water and Wastewater
Asset Additions
6/30/19

J-4.1
MJ
9/10/19

PBC

100 GENERAL FUND — PRINCETON WATER — DATE 07/31/19
001 ASSETS — GENERAL LEDGER REPORT FOR JULY - JULY 2019 — 84
01000 CURRENT ASSETS
01097 CONSTRUCTION FUND ACCOUNT

PD	DESCRIPTION	DATE	REFERENCE		DEBIT	CREDIT	YTD BAL	SUPPL APPR	BGT BAL
08	CONST LOAN CK#1011-JSJ CO	022819	GJ JE			67863.59	868144.93		
09	CONST LOAN-HETHCOAT CK#10	033119	GJ JE			8428.80	859716.13		
09	CONST LOAN-JSJ CK#1013	033119	GJ JE			131668.79	728047.34		
09	CONSTRUCTION LOAN	033119	GJ JE		140097.59		868144.93		
10	CONSTRUCTION FUND	042519	GJ JE		10007.00		878151.93		
10	CONSTRUCTION LOAN #8	042519	GJ JE		154136.78		1032288.71		
10	CONST LOAN-CK#1016-HETHCO	042519	GJ JE			10799.40	1021489.31		
10	CONST LOAN CK#1015-JSJ CO	042519	GJ JE			143337.38	878151.93		
11	REV ENTRIES	050919	GJ JE			167338.02	710813.91		
11	REV ENTRIES	050919	GJ JE			450806.91	260007.00		
11	CONST LOAN-CK#1019-PREF S	052919	GJ JE			188800.20	71206.80		
11	CONST LOAN-CK#1018-HETHCO	052919	GJ JE			11457.90	59748.90		
11	CONST LOAN-CK#1017-JSJ CO	052919	GJ JE			94021.71	34272.81CR		
11	CONST LOAN-#9	052919	GJ JE		294279.81		260007.00		
12	CONST LOAN-CK#1022-SANDBL	062519	GJ JE			90484.12	169522.88		
12	CONST LOAN-CK#1021-HETHCO	062519	GJ JE			17252.70	152270.18		
12	CONST LOAN-CK#1020-JSJ CO	062519	GJ JE			192589.64	40319.46CR		
12	CONST LOAN #10	062519	GJ JE		300326.46		260007.00		
TOTAL CONSTRUCTION FUND ACCOUNT					2887253.48	2627246.48	260007.00		

Period 13 FY2019

Debit
100-400-06600 - 06670
OK. Started

01510	FIXED ASSETS								
01	YR BEGIN BALNCE FORWRD	070218	GL BF AUTOMATI		31482966.22 (1)		31482966.22		
01	ADJUSTING BAL FORWRD	071718	GL BF AUTOMATI		2177.10 (1)		31485143.32		
01	MISC. CONT. TO SYSTEM	073118	GJ JE		2041.46 (2)		31487184.78		
01	ADJUSTING BAL FORWRD	081418	GL BF AUTOMATI			(1) 17665.00	31469519.78		
01	ADJUSTING BAL FORWRD	060619	GL BF AUTOMATI			(1) 20344.00	31449175.78		
02	INTERNAL BILLING	083118	GJ JE		2035.88 (2)		31451211.66		
04	MISC. CONT. TO SYSTEM	103118	GJ JE		8008.64 (2)		31459220.30		
05	MISC. CONT. TO SYSTEM	113018	GJ JE		786.23 (2)		31460006.53		
06	MISC. CONT. TO SYSTEM	123118	GJ JE		792.00 (2)		31460798.53		
07	STRAEFFER PUMP & SUPPLY,	012519	AP PJ 0007156	(3)	13519.87		31474318.40		
07	MISC. CONT. TO SYSTEM	013119	GJ JE		150.00 (2)		31474468.40		
08	RANDY JORDAN ELECTRIC, LL	022019	AP PJ 0007249	(3)	4325.00		31478793.40		
08	MISC. CONT. TO SYSTEM	022819	GJ JE		832.74 (2)		31479626.14		
09	MISC. CONT. TO SYSTEM	033119	GJ JE		1826.81 (2)		31481452.95		
10	SLEDGES ELECTRIC SERVICE	040819	AP PJ 0007445	✓	27411.44		31508864.39		
10	MISC. CONT. TO SYSTEM	043019	GJ JE		550.00 (2)		31509414.39		
11	MISC. CONT. TO SYSTEM	053119	GJ JE		3708.80 (2)		31513123.19		
12	SEWER PROJECT	062519	GJ JE	✓	74562.80		31587685.99		
12	ADJ ENTRY-FIXED ASSETS	062719	GJ JE			(2) 4641.60	31583044.39		

(2) Adjusting Entry
~~200-6105~~ $16,090.96
1510 $16,090.96
(to move expenses from fixed assets)

Credit

(3) Pumpkin Center Lift Station Pump/Wiring
$17,844.87 ✓

(1) $31,447,134 beginning balance

✓ added to depreciation schedule

13 BOOK VALUE MAPLE SEWER PR	071719	GJ	JE	84529.34		31667573.73	
13 REV ENTRIES-7-15-19	072319	GJ	JE		84529.34	31583044.39	
TOTAL FIXED ASSETS				31710224.33	127179.94	31583044.39	
01520 ACCUMULATED DEPRECIATION						(16,090.96)	AJE
						31,566,953.43	TB

8. Refer to Princeton's response to Staff's Second Request, Item 1.a, Pro Forma Income Statement for Fiscal Year ending June 30, 2019, Excel Spreadsheet, Tab: ProForma Income Stmt and to Princeton's response to January 10, 2020 Order, Item 12. The table below contains the total salaries reported for each expense category. Provide an explanation for each discrepancy between the amount reported in the two responses.

	PSC 2-1 Pro Forma Tab: Proforma Income Stmt	PSC 1-12 2019 Employee Wages & Healthcare Electon
a. Administration	$ 220,629	$ 218,145
b. Water Treatment Plant	$ 178,041	$ 171,682
c. Maintenance	$ 251,546	$ 257,569

Response: Two adjusting entries, accrued vacation and accrued salaries, are typically made at the end of each fiscal year that affects the total departmental wages. These entries are not allocated to individual employees in the payroll system; therefore, would not show up in the totals allocated to each employee as shown in PSC 1-12. The following entries were made at the end of the fiscal year:

Account #	Description	Debit	Credit
100-6010	Salary Expense - Admin	952.89	
200-6010	Salary Expense - WTP	544.27	
300-6010	Salary Expense - WWTP	173.88	
400-6010	Salary Expense - Maint		4.75
100-002-02000-02101	Accrued Salaries		1,666.29
100-6010	Salary Expense - Admin	1,530.48	
200-6010	Salary Expense - WTP	1,872.02	

300-6010	Salary Expense - WWTP		206.40
400-6010	Salary Expense - Maint	2,724.51	
100-002-02000-02100	Accrued Vacation		5,920.61

Administration $218,145 + $952.89 + $1,530.48 = $220,628.37

Additionally, as shown in Princeton's response to the January 10, 2020 Order, Item 9 Wage Breakdown, when employees work solely in other departments, their time is allocated as such. Employee # 206 worked at the WWTP and $2,258.72 of his wages were allocated to that department. Maintenance employees had $6,255.47 allocated to WTP and $2,541.22 allocated to the WWTP. These adjustments, in addition to the salary and vacation accrual adjustments result in the following:

WTP = $171,682+$544.27+$1,872.02-$2,258.72+6,255.47=$178,095 (+$54)

Maint = $257,569 +$2,724.51-$4.75- $6,255.47- $2,541.22 = $251,492 (-$46)

Witness: Tracy B. Musgove

9. Refer to Princeton's response to Staff's Second Request, Item 1.a, Pro Forma Income Statement for Fiscal Year ending June 30, 2019, Excel Spreadsheet, Tab: PSC 2-2. Provide copies of the workpapers and calculations used by Princeton to compute the water division's Average Annual Debt Principal and Interest Payments of $176,065.

Response: The following information was provided as a response to Item 6e of the Commission's first request for information.

	Principal	Interest	Total P&I
FYE 06/30/2021	$ 78,000	$ 96,486	$ 174,486
FYE 06/30/2022	$ 84,000	$ 93,822	$ 177,822
FYE 06/30/2023	$ 85,000	$ 90,887	$ 175,887
Three Year Average			**$ 176,065**

Witness: Tracy B. Musgove

10. Refer to Princeton's response to Staff's Second Request, Item 1.a, Pro Forma Income Statement for Fiscal Year ending June 30, 2019, Excel Spreadsheet, Tab: 2021 Payroll.

a. Confirm that this spreadsheet represents Princeton's budgeted/forecasted employee related expenses for the Fiscal Year ending June 30, 2021. If this is not the purpose of this spreadsheet, provide a detailed explanation as to why it references 2021 and identify what it represents.

b. The cell entries on this spreadsheet are all hard entered. Provide a revised 2021 Payroll spreadsheet with all of the calculations intact and fully accessible. Also, provide the source document for each calculation.

Response: Refer to attached Excel worksheet labeled PSC 3-10 Salary Budget FY2021

a. This spreadsheet was the first draft of the employee salary budget and benefits for the upcoming 2021 fiscal year. Since the time of the previous submission to the PSC, one employee resigned and the decision to replace him is being deferred. Additionally, part-time office labor was reduced due to the hiring of the full time employee and the progression the new employee was making in learning the operations. The final salary budget with a 1.50% COLA is attached and an Amended Pro Forma (Excel file: Amended PSC 2-1 Pro Forma) with these salaries has also been attached.

b. Refer to attached Excel worksheet labeled PSC 3-10 Salary Budget FY2021 which is being presented to Board for approval at April 30th meeting.

Case No. 2019-00444
Princeton Water and Wastewater Wholesale Water Rates Increase
Responses to Commission Staff's Third Information Requests

Witness: Tracy B. Musgove

11. Refer to Princeton's response to January 10, 2020 Order, Item 12.

a. Identify each administrative employee responsible for customer billing and collections. Provide an estimate of the time each employee spends each month performing those functions. Include documentation to support Princeton's estimates.

b. Identify each maintenance employee responsible for meter reading. Provide an estimate of the time each employee spends reading Princeton's customers meters. Include documentation to support Princeton's estimates.

Response:

a. The two part-time clerical employees, #155 and #201, are used 100% for customer billing, collections and servicing the accounts. In addition, a new employee #210 was hired in November 2019 and is currently allocated 100% to the customer billing, collection and servicing of accounts but is being cross-trained to be able to do duties of employee # 186 and # 198. The part-time employee's work schedules revolve around the last and first weeks of the month, in addition to the 15th – 17th. These are the times after the bills are mailed and customer traffic is the heaviest around the due dates and final pull dates. Each of these three employees are tasked with answering the phone, waiting on drive-thru customers and those that come into the office; preparing connects, disconnects, work orders, balancing daily deposits, working up the mail and night drop billings, and helping out other associates if needed.

Employee # 186 is the office manager and is in charge of the actual billing

system and the payroll. Payroll is completed every Wednesday and generally takes approximately 3 hours (7.5% of a 40 hour work week). Other than payroll, the balance of his time (92.5%), is totally related to customer billing, collections, and servicing of the accounts to include the following: manually enter and review wholesale readings on 1st of the month and prepare data for MOR report; load data for monthly meter reading; review QS1 reports on leaks, high usage, tampered meters, inactive meters with usage and departures from average bills; notify customers personally on leaks and high readings; prepare list for meter reader to reread certain accounts; assess penalties after the 5th and 15th and notify customers via OneCall system; prepare report and door tags for maintenance to pull meters for non-payment; enter any manual readings and pro-rate bills for new customers; on the 20th – 22nd prepare billing and print approximately 3,350 postcard bills; separate by zip code and sort for those who wish to be notified by email; process leak and pool adjustments seasonally; prepare ACH bank draft file and submit to bank on the 4th; and prepare final bills and refund checks every Friday. He also relieves the up front office workers during lunch and on the days that no part-time worker is scheduled to report.

Employee # 198 works approximately 50% on customer collections and servicing of accounts and the other 50% is spent on numerous tax form preparations, accounts payable entry and paying vendors, general ledger entries, invoicing of customers for meter settings and taps, CERS deposits, insurance maintenance, maintaining KEHP health insurance record keeping along with all employee benefits to include dental, vision, short term disability and life insurance. This employee also aids the Superintendent and Director of Finance with preparation of board reports and other

reporting requirements.

b. Maintenance employee # 192 is typically the one employee in charge of reading the meter routes, although, several of the other employees are trained to do this task. The meter reading is usually done around the 12th of the month and is accomplished within two days if all goes well with the data system. On the first of the month, two employees go to each of the wholesale master meters and manually read each of the CCWD and LCWD meters. This takes approximately ½ the day to accomplish.

Witness: Tracy B. Musgove

12. Refer to Princeton's response to Staff's Second Request, Item 3.

a. Item 2.(6) originally requested:

> For each category, the schedule should include the date of each transaction, the check number or other document references, the vendor, the hours worked, the rates per hour, the amount, a description of the services performed, and the account number in which the expenditure was recorded. Provide copies of contracts or other documentation that support charges incurred in the preparation of this case. Identify any costs incurred for this case that occurred during the base period.

For each category Princeton identified in its response (legal fees; engineering; and Director of Finance) provide the information as originally requested.

b. Provide copies of the "Sturgill, Turner, Barker & Moloney" invoices that support the legal fees listed in Princeton's response.

c. Provide copies of the "Hethcoat & Davis" invoices that support the engineering fees listed in Princeton's response.

Response: Supplemental information is being provided in an Excel file labeled as PSC 2-3 Rate Case Expense – April 16 Supplement. Copies of the invoices received to date were produced in the monthly supplement filed on April 6, 2020.

Witness: Tracy B. Musgove

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

Proposed Adjustment of the Wholesale	)	
Water Service Rates of the Princeton	)	Case No. 2019-00444
Water and Wastewater Commission	)	

CERTIFICATION OF RESPONSES TO INFORMATION REQUESTS

This is to certify that I have supervised the preparation of the Princeton Water and Wastewater Commission's responses to the Commission Staff's Third Request for Information and that the responses are true and accurate to the best of my knowledge, information, and belief after reasonable inquiry.

Date: 4/17/2020

/s/ Tracy B. Musgove
Tracy B. Musgove, Finance Director