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STEVE CRISAFULLI
*Speaker of the House of
Representatives*



October 27, 2016

Ms. Carlotta Stauffer, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850
Sebring, FL 33870

Re: Docket No. 150071-SU, Application for increase in wastewater rates in Monroe County
by K W Resort Utilities Corp.

Dear Ms. Stauffer:

Please find enclosed for filing on behalf of the Office of Public Counsel ("OPC"), an errata sheet to the Direct Testimony of Patricia W. Merchant, CPA. Also enclosed is Exhibit PWM-5. This exhibit was amended to provide a re-typed version of three pages of illegible schedules provided by KWRU to the staff auditors.

Thank you for your assistance in this matter. Please feel free to contact me if you or your Staff have any questions regarding this filing.

Sincerely,

A handwritten signature in blue ink, appearing to read "Erik L. Saylor".

Erik L. Saylor
Associate Public Counsel

Enclosures

cc: All Parties of Record

Patricia W. Merchant Errata Sheet to her Direct Testimony

Page 10, line 5 remove the “comma” after test year

Page 38, line 15, remove the “s” on adjustments

Page 38, lines 18 to 22, remove “Audit Finding 1, the auditors reduced plant by \$30,090 for engineering costs related to the wastewater permit modification and reclassified the costs to add them to the deferred asset account for the wastewater permit fees. I agree with this adjustment to remove the costs from plant in Phase I, and I have included them in the balance of CWIP. Further, in”

Page 38, line 24, remove “also”

Page 47, line 12 replace “.075%” should be “0.75%”

Page 49, line 4 replace “0.075%” with “0.75%” and replace “3.584%” with “4.25%”

Page 49, line 16, replace “3.39%” with “3.99”

K W Resort Utilities Corp

Pro Forma Adjustments to Operations & Maintenance Expenses

Increase due to changes in operations due to upgrade to AWT standards.	Adjustments	Description
701 Salary & Wages	\$ 155,996.00	Project salary expense due to new requirements minus 2014 actual expense *
704 Employee Pension & Benefits	42,762.00	Employee Benefits on additional salaries.
7048100 Employee Relations	\$ 630.00	
7048200 Employee Benefit/Health	36,132.00	
7048300 Employee Training	6,000.00	
711 Sludge Disposal	109,334.00	Additional sludge disposal due to plant expansion minus actual 2014 expense *
715 Purchased Power	42,900.00	Additional due to plant expansion *
718 Chemicals	224,741.00	
7180500 Chemicals	224,065.00	Additional chemicals due to plant expansion minus actual 2014 expense *
7180510 Supplies	676.00	
720 Materials & Supplies	60.00	
731 Contractual Services - Engineer	4,730.00	Additional due to plant expansion
735 Contractual Services - Testing	20,673.00	Additional testing due to plant expansion *
736 Contractual Services Other	28,557.00	Additional due to plant expansion
7360200 Vacuum Stn Repairs & Maint	6,065.00	
7360330 Vacuum Collection Sys	8,859.00	
7360410 Lift Stations Cleaning	919.00	
7360420 Lift Stations Repair & Maintenance	504.00	
7360430 Pumps & Panels	6,323.00	
7360520 Equipment Repair & Maintenance	360.00	
7360540 Generator Maintenance	21.00	
7360600 Grounds and Office Maintenance	(29.00)	
7360610 Plant Repair or Maintenance	5,535.00	
757 Insurance - Gen Liab	2,752.00	
758 Work Comp Insurance	25,555.00	Additional insurance due to additional salaries
760 Advertising	(1,564.00)	
775 Miscellaneous Expense	9,638.00	Additional expenses due to plant expansion
7750510 Utilities	156.00	
7750820 Postage	634.00	
7750821 Courier	3,595.00	
7750822 Payroll Admin Costs	2,281.00	
7750830 Telephone & Fax	1,858.00	
7750850 Dues & Subscriptions	109.00	
7750880 Computer	59.00	
7750900 Reimbursed Admin Expenses	1,083.00	
7750500 Sanitation	(137.00)	
775 Deferred Expense	103,917.00	To amortize legal fees of \$519,585 over 5 years. Cost incurred to defend 5 year permit renewal
Total Proforma Adjustments to O & M	<u>\$ 770,051.00</u>	

* See attached supporting documentation

701 Salary and Wages Estimated

	Salary Amount	2014
Wastewater Plant Operator New Staffing Requirement goes into effect Jan 1, 2016 additional hours = 1248 hours per year additional	\$ 62,000	
Collection Tech	\$ 42,000	
and sludge processing 1/2 year for 2016	\$ 52,000	
		2014
		Actual Expense
		\$ 590,900.23

	2015
mid yr hire	\$ 31,000.00
mid yr hire	\$ 21,000.00
	\$ 52,000.00
2014 Actual	\$ 590,900.23
2 Additional Employees ONLY for half the year	\$ 52,000.00
salary increase allowance 1.18%	\$ 6,995.77
2015 Total	\$ 649,896.00

	2016
mid yr hire	\$ 62,000 full year
mid yr hire	\$ 42,000 full year
	\$ 52,000 full year
	\$ 156,000 Total Salary Expense New St
2014	\$ 590,900
Additional Payroll	\$ 156,000
2016 Total	\$ 746,900.23

711 Sludge Disposal

Estimated Sludge Disposal Per Weiler Memo May 29,2015		\$148,728.16
less	2014 Actual	<u>\$ 39,394.00</u>
	Adjustment	\$109,334.16

WEILER ENGINEERING CORPORATION



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MEMORANDUM

To: Christopher Johnson
From: Ed Castle, PE
Date: May 29, 2015
Re: 2016 Sludge Cost Estimates

I have estimated the quantity of sludge to be hauled from KWRU in 2016 under the following assumptions.

- Total Flow to WWTP: 0.550 MGD AADF
- Irrigation flow to KWGC: 0.300 MGD AADF
- Effluent discharged to wells: 0.250 MGD AADF
- Phosphorus removal at all times regardless of destination of effluent
- Drying beds will be used to their maximum capacity
- A mobile centrifuge will be brought in as needed to augment drying bed capacity, estimated 4X per year

Based on these assumptions, the following quantities and costs are estimated:

- 527,528 gallons of liquid sludge will need to be processed in the centrifuge at a cost of **\$72,757.79 annually**.
- 243 tons of sludge cake will need to be hauled at a cost of **\$75,970.37 annually**.
- Estimated total annual cost: **\$148,728.16**

The attached spreadsheet summarized the calculations in more detail. I will be happy to explain the calculations if you wish.

2016 Solids Budget for KWRU

Assumptions:

Average 550,000 GPD treated, alum added for TP removal

Drying Bed Limit:

		.55 mgd w/ alum	Total
Dry tons/yr, 2016		99	99

.45 MGD
66 Dry tons.

Drying bed sludge @ 85% solids, tons	78	wet tons to be hauled from drying beds
Centrifuge sludge @ 20% solids, tons	165	wet tons to be hauled from centrifuge
Total	243	wet tons to be hauled

527,578 gallons per year to be processed by centrifuge @ 1.5% solids

1,055,156 gallons per year poured onto drying beds @ 1.5% solids

Dewatering cost assumptions:

Need to dewater 4 times/year
Mobilization cost \$5,000 per trip
Processing cost \$0.10/ gallon

Dewatering Cost Estimate

Gallons/trip	131,894
Mobilization	\$5,000.00
Processing	\$13,189.45
Cost/trip	\$18,189.45

Cost/yr \$72,757.79

Hauling & Disposal Cost Estimate

Cost/ton	\$313.09
Tons of Cake	243

Cost/yr \$75,970.37

TOTAL \$148,728.16

PLANT POWER expense with Addition of .350 MGD WWTP

Running AWT with .350MGD new plant for 6 months in 2016 (\$85800 annually based on 835,002 kWhr annually from Edward R. Castle @\$0.1027 per kWhr current KEYS rate)

715 2016 Plant Power Estimated Expense				
Cost of Plant Power Purchased in 2014		\$	129,151.97	
Plus the power requirement of new .350MGD plant online July 1, 2016		\$	<u>42,877.35</u>	
		\$	<u>172,029.32</u>	
Power Expense Estimate for .350 MGD WWTP				
Electrical Equipment .350 MGD Plant	kWhr per Annum	Keys Energy Current Rate		
Using Horsepower, Amp Draws, Estimated Run times per Edward R. Castle P.E., Weiler Engineering Corp.	835,002	@\$0.1027 per kWhr	\$	85,754.71
Additional Plant will require		\$	85,754.71	per year
Assume plant is up and running mid year		\$	42,877.35	for 6 months

PLANT POWER expense with Addition of .350 MGD WWTP

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	\$ 172,029.32

Power Expense Estimate for .350 MGD WWTP	Keys Energy Current Rate
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835,002 \$ 85,754.71	
Additional Plant will require	\$85,754.71 per year
Assume plant is up and running mid year	\$42,877.35 for 6 months

Amended because the formatting on the original document provided by the Utility to the staff auditors did not reproduce legibly. Document retyped for legibility by PWM.

Bleach 2014 pricing	Glycerine	Alum	Other Chem	
\$ 28,875.00			\$ 32,330.08	total chem 2014
.507 MGD			\$ 26,255.18	less cl2 2014
			\$ 6,074.90	yields other chems
.550MGD				
\$ 31,324.30	\$ 94,517.82	\$ 31,293.38	\$ 6,074.00	\$ 256,395.29

Bleach 2014 pricing	Glycerine	Alum	Other Chem	
\$28,875.00			\$ 32,330.08	total chem 2014
.507 MGD			\$ 26,255.18	less cl2 2014
			\$ 6,074.90	yields other chems
.550MGD				
\$ 31,324.30	\$ 94,517.82	\$ 31,293.38	\$ 6,074.00	\$ 163,209.50

KWRU provided document retyped for legibility by PWM

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Cost Per Gallon	Total Annual gallons	Ratio to 650MGD	
1.35	23617.6	64.71	Sodium Hypochlorite = 100 GPD
2.74	34009.4	93.18	Sodium Hydroxide = 144 GPD
3.45	27396.5	75.06	Glycerine = 116 GPD
2.65	11808.8	32.35	Alum = 50 GPD

Docket No. 150071-SU
PSC Audit DR 5 Pro Forma Expenses
Amended Exhibit PWM-5, Page 8a of 13

Cost Per Gallon	Total Annual gallons	Ratio to 550MGD	
1.35	23617.5	64.71	Sodium Hypochlorite = 100 GPD
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PDR

G. DISINFECTION (calculations based on four chlorine contact chambers in two basins)

The Chlorine Contact Chamber is required to provide a minimum contact period of 15 minutes at design peak hourly flow or the maximum pumping rate. The facility has flow equalization, which will result in using a peaking factor of 1.5 instead of 4.

Detention time = V/Q

Volume = 11,489 gal per basin, 5,745 gal per chamber, 22,978 gal total

Flow = $Q_{PHF} = 1,273,500 \text{ gpd}$ or 885 gpm or 53,063 gph

$\Theta = V/Q$ $\Theta = 0.25 \text{ hr.}$

$V_{\text{REQUIRED}} = (0.25 \text{ hr})(53,063 \text{ gph}) = 13,266 \text{ gal}$

22,978 gal > 13,266 gal therefore size is Adequate

@ 75% Operation (1 of 4 chambers off line) = 17,234 gal > 13,266 gal

22,978 gal/53,063 gph = 26 min. detention time with all 4 in service.

17,234 gal/53,063 gph = 19.5 min. detention time with 3 of 4 in service.

H. SODIUM HYPOCHLORITE SYSTEM

1 pound per day (ppd) chlorine gas = 1 gpd of 12.5% Trade NaOCl

Min. Total Residual Chlorine (TRC) = 1.0 mg/L

Avg. chlorine ppd in recent years (based on 0.343 MGD Flow) = 38.8 ppd

$\text{Cl}_2 \text{ Dosage} = (38.8 \text{ ppd}) / ((8.34 \text{ lb/day}) / (343 \text{ MGD})) = 14 \text{ mg/L}$

$\text{Cl}_2 \text{ Dosage rate, in ppd for design flow} = (.849 \text{ MGD})(8.34 \text{ lb/gal})(14 \text{ mg/L}) = 99.2 \text{ ppd}$

Gallons of 12.5% NaOCl needed per day = $(99.2 \text{ ppd Cl}_2)(1 \text{ gpd } 12.5\% \text{ NaOCl} / 1 \text{ ppd Cl}_2)$
= 99.2 gal/day

With 1.5 safety factor = $(99.2 \text{ gal/day})(1.5) = 148.8 \text{ gal/day}$

Min. Tank size needed: $(148.8 \text{ gal/day})(15^{**} \text{ days}) = 2,500 \text{ gal}$

Tank will be opaque for UV protection and rated for exterior use

* Dosage rate based on average feed rate of chlorine gas needed to satisfy chlorine demand and maintain desired TRC.

** Due to short shelf life of the sodium hypochlorite solution, a tank that allows for only 15 days of storage will be used instead of 30 days to prevent degradation of the sodium hypochlorite solution.

PDR

I PHOSPHORUS REMOVAL

ALUM	$Al_2(SO_4)_3 + 18H_2O$
ALUM STRENGTH	48.5%
DENSITY OF ALUM SOL'N	11.2 lb/gal
MOLECULAR WT. OF ALUM	594.0
MOLECULAR WT. OF ALUMINUM	26.98
MOLECULAR WEIGHT OF P	30.97

STEP 1 WEIGHT OF ALUMINUM REQUIRED PER UNIT OF PHOSPHORUS
A. THEORETICAL DOSAGE 1 MOLE AL PER 1 MOLE P
ALUMINUM REQUIRED = (MW AL/MW P)
= (26.98/30.97)
= 0.87 lb AL/lb P

STEP 2 WEIGHT OF ALUMINUM AVAILABLE PER GALLON OF ALUM
A. Weight of alum per gallon of solution
= 0.485 X 11.2 lb/gal = 5.43 lb/gal
B. Weight of Aluminum per gallon
= 5.43 lb/gal * (2 * 26.98/594.0) = 0.493 lb/gal

STEP 3 POUNDS OF P IN INFLUENT
= mg/L P * FLOW, MGD * 8.34
= 8 * 0.849 * 8.34
= 56.6 lbs influent phosphorus

STEP 4 AMOUNT OF ALUM SOLUTION REQUIRED PER LB OF PHOSPHORUS
Alum Dosage = (0.87 lb AL/lb P) * (1 GAL ALUM SOL/0.493 lb AL)
= 1.76 GAL ALUM SOLUTION/lb P
= 1.76 * 28.3 lb
= 49.8 gallons of alum solution required for 0.849 MGD facility capacity

Since significant biological uptake of phosphorus occurs in the activated sludge process, the clarifier influent will have significantly less than the 8 mg/l used in the dosing calculations, providing a safety factor in the designed dosing rate.

Min. tank size needed: (49.8 gal/day) (30 days) = 1,494 gal tank

Tank will be opaque for UV protection and rated for exterior use

PDR

J. GLYCERIN

Solution used will be 70% Glycerin as provided by manufacturer

Glycerin BOD: 870,000 mg/L

7 lb BOD = 1 gal Glycerin

Dissolved Oxygen (D.O.) going into anoxic zone = 2 mg/L

Influent NH₄ = 40 mg/L

NH₄ to NO₃ = (62/17)(40 mg/l) = 146 mg/L NO₃

Oxygen present = (((16*3)/(62))(146 mg/L)+2)(8.34 lb/gal)(0.849MGD) = 814 lbs/day

Glycerin solution needed per day: (814 lb D.O.)/(7 lb/gal glycerin) = 116.3 gal/day*

Min. tank size needed: (116.3 gal/day)*(15 days) = 1744.50 gal

* There is no safety factor being used for glycerin need because the tanks have been oversized to allow for endogenous decay which provides an additional carbon source.

K. ALKALINITY DOSING

Strength	50%
Density of Solution	12.76 lb/gallon
Molecular Weight NaOH	39.997
Molecular Weight Na	22.98
Molecular Weight OH	17.00
Weight of NaOH	= 0.5 x 12.76 lb/gal = 6.38 lbs lb/gal
OH per gallon	6.38 x (17.00/39.997) = 2.71 lbs
Pounds of NH ₄ per day	(40 mg/L)(8.34 lb/gal)(0.849MGD) = 283 lbs
Pounds of CaCO ₃ needed per day	(283 lbs)(7.07 lbs CaCO ₃ /lb NH ₄) = 2,001 lbs
Pounds of H ₂ O per day	(120 mg/L)(8.34 lb/gal)(0.849 MGD) = 850 lbs
Pounds of CaCO ₃ added per day	= 2001-850 = 1,151 lbs
Milliequivalent weights of CaCO ₃	50 mg/meq
NaOH	40 mg/meq
Pounds of NaOH per day	= (40/50)(1,151 lbs) = 921 lbs

During nitrification/denitrification in aeration basins there is release of some alkalinity so no safety factor will be used.

PDR

Min. tank size needed: $((921 \text{ lbs} * 2) / (12.76 \text{ lb/gal})) * 30 \text{ days} = 4,331 \text{ gal}$

Tank will be opaque for UV protection and rated for exterior use

The theoretical dose is 1 mole NaOH per 1 mg/L alkalinity. The above calculations are based on assumptions regarding the alkalinity concentration needed and may change accordingly. All chemical feed pumps will be sized to accommodate any variables encountered.

FDEP Sampling Parameters after Expansion

Parameter	Frequency	Cost	Annual Cost
Effluent			
Well Monitoring Requirements			
Biological Oxygen Demand (CBOD)	Weekly	\$ 25.00	\$1,300.00
Suspended Solids (TSS)	Weekly	\$ 25.00	\$1,300.00
Fecal Coliform	Weekly	\$ 25.00	\$1,300.00
Chlorine Test (TRC)	5 days/week	\$330 / year	\$330.00
Total Nitrogen	Weekly	\$ 35.00	\$1,820.00
Total Phosphorus	Weekly	\$ 20.00	\$1,040.00
Reuse Monitoring Requirements			
Suspended Solids (TSS)	Daily	\$ 25.00	\$9,125.00
Fecal Coliform	Daily	\$ 25.00	\$9,125.00
Chlorine Residual (TRC)	Continuous	\$70/month	\$840.00
Giardia	Every 5 yrs	\$ 1,050.00	\$1,050.00
Cryptosporidium	Every 5 yrs	\$ 2,310.00	\$2,310.00
Influent			
Biological Oxygen Demand (CBOD)	Weekly *	\$ 25.00	\$1,300.00
Suspended Solids (TSS)	Weekly	\$ 25.00	\$1,300.00
Total			\$32,140.00
Courier			
Daily Pick up	7 days/week	\$ 27.50	\$10,037.50
Fuel Surcharge	Estimated	\$1300 /year	\$1,300.00
Total			\$11,337.50
Process Control			
4 tests per day per plant (3 Plants, 4 testing basins)			
Ortho P			\$ 2,095.00
Nitrogen			\$1,860.00
Ammonia			\$5,306.00
Alkalinity			\$2,375.00
Total			\$11,636.00