

Wastewater Plant Energy Assessment

(SAMPLE)

Completed by: ABC Engineering

Customer Contact: John Doe

Date: XX/XX/XXXX

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EXECUTIVE SUMMARY

The executive summary should include a brief description of the facility, history, and scope of the energy audit as well as the time period when the energy audit occurred. This section should include a list of information used to develop the audit. Additionally, this section should include a summary of the assessment findings/recommendations and a summary of the facility's energy benchmarks (kWh/MG and kWh/1,000 lb. BOD).

INTRODUCTION AND BACKGROUND INFORMATION

In this section describe the site, location, treatment processes, design, average and peak flows, as well as the local population that relies on the facility. This section could include any problems the facility has been experiencing – not meeting permit limits, nearing hydraulic or organic capacity, poor score on CMAR or poor ranking in the energy data from the CMAR as examples.

EXISTING INFRASTRUCTURE AND PROCESSES

This section should include an overall plant performance summary, as well as a list (Table 1 below) of all relevant plant equipment, how often it operates, and estimates how much energy the equipment uses. Also, provide information on the buildings such as building occupancy, construction type, lighting systems, HVAC systems, and include a site map and/or relevant photos. Include a list of equipment that is continually causing problems in the plant.

Tag	Description	HP	% Loaded	Annual Hrs.	KW	kWh/yr
RAS-1	Return Activated Sludge Pump	10	90%	4,380	6.71	29,390
RAS-2	Return Activated Sludge Pump	10	90%	4,380	6.71	29,390
Cont.	Continued..					

Table 1: Equipment Inventory and Estimated Energy Use

ENERGY USE ANALYSIS

Show the yearly energy usage of the facility including total kWh and peak demand. Benchmark the facility's energy use (kWh/MG and kWh/1,000 lb. BOD). Compare the facilities energy use to 2016-2019 CMAR data collected by DNR (appendix 1). Contact Focus on Energy, Energy Advisor Joe Kottwitz (joe.kottwitz@focusonenergy.com) for 2016-2019 CMAR data summary.

ASSESSMENT FINDINGS

**Include a thorough description of each measure's existing equipment, proposed equipment, the energy savings and utility bill savings expected, capital investment, return on investment as well as the method for verifying if the recommendation was successful. Include pictures whenever possible.*

Prioritized Recommendations	Estimated Cost Savings	Simple Payback
1. Modify Dissolved Oxygen level in Aeration tank		
2. Clean UV Lamp sleeves to improve transfer efficiency		
3. Install Fine bubble aeration		
4. Upgrade blower technology		

Table 2: Prioritized Recommendations

Low Cost/No Cost Recommendations (Examples)

1. Modify Dissolved Oxygen level in Aeration tank
Existing state:
Proposed state: Include equipment interactions during installation
Savings & Investment:
Measurement & Verification Plan:
2. Clean UV Lamp sleeves to improve transfer efficiency
Existing state:
Proposed state:
Savings & Investment:
Measurement & Verification Plan:
Continue on with complete list of low cost/no cost ECMs

Capital Improvement Recommendations (examples)

Along with * above – please provide detailed engineering calculations along with assumptions clearly stated.

3. Install fine bubble aeration
Existing state:
Proposed state:
Savings & Investment:
Measurement & Verification Plan:
4. Upgrade Blower Technology
Existing state:
Proposed state:
Savings & Investment:
Measurement & Verification Plan:

APPENDIX 1: CMAR DATA

Flow Range (MGD)	Number of Facilities	Median Flow (MGD)	Best Quad (kWh/MG)	Median (kWh/MG)	Lowest Quad (kWh/MG)	Savings Median to Best	Median Savings Electric Cost Median to Best	Savings Worst to Best	Count with Zero kwh
0 - 0.05	163	0.023	123.33	3,825.65	9,089.09	96.78%	\$ 3,194	98.64%	34
0.05 - 0.125	117	0.072	1,542.22	4,253.15	6,357.29	63.74%	\$ 7,565	75.74%	6
0.125 - 0.25	79	0.184	2,677.83	3,894.32	5,523.13	31.24%	\$ 8,244	51.52%	0
0.25 - 0.5	70	0.352	2,290.91	3,607.38	4,564.06	36.49%	\$ 15,515	49.81%	1
0.5 - 1	39	0.644	1,921.98	2,781.67	3,207.98	30.91%	\$ 19,767	40.09%	0
1 - 5	58	1.630	1,702.18	2,058.50	2,906.92	17.31%	\$ 25,889	41.44%	0
>5	19	10.986	1,351.18	1,965.30	2,487.36	31.25%	\$ 203,870	45.68%	0
0-100	545	0.118	1,575.52	3,237.91	5,663.82	51.34%	\$ 8,636	72.18%	41

Flow Range (MGD)	Number of Facilities	Median Electricity Consumed (kWh)	Best Quad (kWh/BOD)	Median (kWh/BOD)	Lowest Quad (kWh/BOD)	Electric @ \$0.10/kwh \$/MG	Total kwh	Total Influent Flow (MG)	Average kWh/MG	Median (kWh/MG)
0 - 0.05	163	33,004	95.54	2,761.99	5,723.26	\$ 3,300	9,231,906	1,454	6,351	3,826
0.05 - 0.125	117	118,680	1,253.23	2,701.51	4,230.17	\$ 11,868	16,664,908	3,290	5,066	4,253
0.125 - 0.25	79	263,920	2,056.31	2,838.25	3,925.73	\$ 26,392	22,090,896	5,284	4,181	3,894
0.25 - 0.5	70	425,140	1,489.41	1,904.17	2,715.07	\$ 42,514	30,702,513	8,999	3,412	3,607
0.5 - 1	39	639,606	995.86	1,422.73	2,063.95	\$ 63,961	27,199,810	9,737	2,793	2,782
1 - 5	58	1,495,596	826.82	1,057.86	1,400.75	\$ 149,560	93,400,811	43,517	2,146	2,059
>5	19	6,524,275	675.56	1,101.78	1,278.79	\$ 652,428	288,250,054	148,552	1,940	1,965
0-100	545	168,200	987.59	2,062.65	3,859.35	\$ 16,820	487,540,898	220,833	2,208	3,238