



City of
Santa Rosa
Utilities Department
MEMORANDUM

Date: March 10, 2015
 To: Contract Subcommittee to the Board of Public Utilities
 From: Colin Close, Research & Program Coordinator
 Subject: Energy Optimization Plan (EOP) Status Update

Kennedy/Jenks Consultants (K/J) has completed the first phase of work for the Energy Optimization Plan (EOP). K/J conducted audits of major areas of the Subregional System, including the Laguna Treatment Plant (LTP), Biosolids Compost facility, Reclamation System, and Geysers System in an effort to identify potential projects for optimizing energy use. After completing the audits of equipment and operations, K/J concluded that the Subregional System is in the top-tier nationally in its performance and practices.

While K/J found no “low hanging fruit,” K/J did identify energy efficiency measures and process improvements that could potentially further optimize energy use. The results are shown in the table below. All recommendations are under consideration by staff. Those that are being actively pursued at this time (have funding now or will be funded in the foreseeable future) are shown with an asterisk (*). Those that are currently being tested or explored further for feasibility are marked with a dash (—). Those that have been implemented already are shown with a check mark (✓).

POTENTIAL MEASURES	ROI %	NPV of Life of Savings (\$1,000)
LAGUNA TREATMENT PLANT		
Potential Energy efficiency measures		
*Run Idle Cummins Engines on Natural Gas to Generate Electricity	IDTD ¹	\$1,743
*Implement Building and Lighting EEMs	NC ²	IDTD ¹
*Replace Ultraviolet (UV) Disinfection	9%	\$1,231
— Modify 3W Water Scum Spray and Install VFD	NC ²	IDTD ¹
Reduce Air to Mixed Liquor and Primary Feed Channel	NC ²	\$685
Optimize Return Activated Sludge	NC ²	\$447
Stagger Digester Mixing Pumps During Peak Period	NC ²	\$262
Raise Tertiary Filter Wet Well Level	NC ²	\$230
Raise Raw Wet Well Level	NC ²	\$96
Install VFDs on Aerated Grit System	110%	\$43



POTENTIAL MEASURES	ROI %	NPV of Life of Savings (\$1,000)
Potential Process Improvements		
— Enhance SCADA Screens	-	-
— Upgrade Digester Mixing	-	-
— Reduce Sludge Yield	-	-
Increase Belt Press Solids Concentration	-	-
Monitor Primary Sludge pH	-	-
BIOSOLIDS COMPOST FACILITY		
*Modify Exhaust Fan Operation	NC	\$183
— Install Solar PV (PPA)	17%	\$614
RECLAMATION		
— Eliminate Pressure-Relief Bypass	82%	\$25
— Reduce Delivery Pressures	16%	\$22
Optimize Time of Use Rates	1.3%	\$147
GEYSERS		
✓ Limit Operation of the Air-Handling Unit	NC	\$47
— Restore Pipeline Capacity	18%	\$105

¹ IDTD - Insufficient Data To Determine at this time

² NC = Not calculable because the ROI for projects with zero capital cost do not calculate using the Excel IRR function. With zero capital cost the ROI is essentially infinite.

K/J also conducted a brainstorming session with staff from the Subregional System to identify other potential energy optimization options. Staff identified and ranked 49 potential energy optimization projects (above and beyond those projects identified by K/J in the audits). After consolidating and ranking these potential projects, staff and K/J identified the top five projects that are appropriate to evaluate in the next phase of the EOP (below).

POTENTIAL PROJECTS FOR FURTHER ANALYSIS
Waste Heat Investigation (combined heat and power engines)
Energy Management Software Investigation (SCADA system)
Irrigation System Optimization Investigation (recycled water)
Comprehensive Solar PV Investigation (1 megawatt or larger)
Mechanical Digester Mixing Investigation (LTP)

At the conclusion of the first phase of work, staff asked K/J to provide a scope of work and fee schedule for the next stages of work. Part 2 (\$121,960) includes analyzing five potential projects (listed above) over four or five months and producing technical memorandums with findings. Each investigation would entail between 92 and 108 hours of K/J's labor. Part 3 (\$127,306) includes developing an Action Plan for prioritizing and implementing recommendations from Part 1 and Part 2 and writing a report outlining the EOP process and results. Staff recommends moving forward with Part 2 at this time.





The K/J Technical Memorandums are included as background information. The contract for Part 2 of the EOP is included for the Contract Subcommittee’s review and consideration. The contract is tentatively scheduled for consideration by the Board of Public Utilities at their meeting on March 19, 2015.

