

# Summary of Potential Water Conservation Projects

Project	Capital Cost (\$k)	Annual Savings (\$k)	Implementation Time (days)	% Annual Water Savings	Payback Period (years)	Project Rating ( 1 - 3 Scale) ( 1 is low; 3 is high)
<b>SHORT TERM PROJECTS</b>						
Investigate fire water piping leaks	10	UKN	90	UKN	UKN	<b>2.7</b>
Testing of waste water streams for metals and other parameters to determine reusability and treatment requirements.	0	0	90	0%	N/A	<b>2.5</b>
Investigate RO System operational changes - i.e. On-Off mode, recycle of reject during no generation periods, etc.	50	104	180	6%	0.5	<b>2.4</b>
Recycle Carbon Filter Wash Recycle Multimedia Filter (MMF) Wash	300	104	360	6%	2.9	<b>2.4</b>
Recycle RO reject to Cooling Towers	750	90	180	13%	8.3	<b>2.3</b>
Automate boiler blowdown	35	1	90	0.1%	26.9	<b>2.2</b>

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Perform Detailed Water Use Audit by outside contractor	25 - Expense cost	N/A	180	N/A	UKN	2.2
Firewater building flushes - reduce frequency	0	UKN	180	UKN	UKN	2.1
Investigate Drilling wells to replace cooling tower water makeup	200	104	360	6%	1.9	2.0
Retrofit site with no-flush urinals	25	7	90	0.4%	3.8	1.7
Purchase new filters for Cooling Towers	UKN	UKN	270	UKN	UKN	1.7
<b>LONG TERM PROJECTS</b>						
Build a "gray water" storage tank to store recycle streams	1500	N/A	360+	N/A	UKN	2.5
Reuse Air Handling Unit Condensate from Four Buildings	2,500	104	360	6%	24.0	2.3

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Capture and reuse firewater pump test water	30	UKN	360	UKN	UKN	2.3
Bypass Multimedia Filters (MMF) before RO System or replace MMF with cartridge filters	150	142	360+	8%	1.1	2.2
Retrofit w/ dual flush or high efficiency toilets	85	4	90	0.2%	23.0	2.3
Reduce Plant Steam Pressure	0	16	360	2%	0.0	1.8
Reduce CIP - o Reduce amount of CIP washes & rinses o Install online TOC analyzers for CIP washes o Recycle CIP final rinse o Use RO or City Water for Pre-rinse and wash cycles	Up to 3500	240 - 487	720+	15 - 28 %	7 - 15	1.8
Capture Clean Steam Condensate & WFI Blowdown	6,500	32	360	3%	203	1.7
Replace ROs w/ SCS	2,000	350	360+	20%	5.7	1.6

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Replace Boiler with Steam Generator	500	1	540	0.0%	1,000	1.6
Retrofit autoclaves w/ water conservation kits	120	67	360	4%	1.8	1.5
Eliminate Single Pass Cooling	1,500	3	360+	0.2%	500.0	1.5
Drill Water Supply Wells	4,000	2,000	360+	0%	2.0	1.5
Eliminate boiler blowdown quench	UKN	UKN	360+	UKN	UKN	1.5
Storm water retention	30,000	2,000	720	23%	15.0	1.4
Use selected stream process waste water recovery for non-potable use	12,000	550	720	48%	21.8	1.2
Utilize wastewater for irrigation	300	1	360+	0.1%	300.0	1.2

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Build Water Plant on Deep River	30,000	2,000	1080	0%	15.0	1.2
Add cooling tower drift eliminator cones	UKN	UKN	360+	UKN	UKN	1.2

**KEY**

UKN = Information is not known.

MMF = Multimedia Filter

RO = Reverse Osmosis

SCS = Softener - Carbon - Softener System

CIP = Clean - in - place