SUSTAINABLE WATER SYSTEMS BY NORCHEM

# NORCHEM ULTRAPURE CASE STUDY 2

## INDUSTRIAL LAUNDRY

**PLANT / PRODUCT MIX:**

- Industrial Garments
- Mats
- Food Service Garments
- Bar Towels

**CUSTOMER CHALLANGES:**

- High water and sewer cost
- High sewer strength charges
- High energy cost

**PROJECT RESULTS:**

- Reduced the fresh water and effluent wastewater by 14,826,000 gallons ($191,255) per year, equivalent to 49 metric tons of carbon dioxide emissions.
- By recycling hot wastewater, the energy required to heat the water was reduced by 28,431 Therms ($18,517) per year, equivalent to 151 metric tons of carbon dioxide emissions. This is in addition to the savings the laundry had implemented with the standard wastewater heat reclamation systems.
- The use of recycled water back into the process allowed the recycling of chemicals used in the process as well. There was a reduction of $25,413 of wash chemicals annually.

**PROJECT COST / SAVINGS:**

- The implementation of the Ultrapure System resulted in substantial savings of $235,477.
- Capital cost of $683,000
- Payback of 2.9 years as described in the detailed cost analysis is attached showing cost before and after implementation as well as operational cost.
- The implementation of the Ultrapure System not only resulted in substantial savings, it also demonstrated the company's commitment to protecting the environment by reducing Greenhouse Gas Emissions, and drastically reducing its consumption of water, the world most precious natural resource.



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## INDUSTRIAL PLANT COMPLIANCE AND WATER SAVINGS

| CURRENT USAGE AND COST | | | | |
|---|---|---|---|---|
| **Parameter** | **Unit Value** | **Monthly Volume** | **Monthly Cost** | **Yearly** |
| **Wash Floor Production Information** | | | | |
| Hours of operation per week | 58 | 251 | | 3,016 |
| Wash Poundage | 190,000 | 823,333 | | 9,880,000 |
| Fresh Water gal. /lb | 2.14 | | | |
| Washroom Chemical (CWT) | $2.14 | 823,333 | $17,648 | $211,776 |
| **Utility Cost** | | | | |
| Electricity ($/kWh) | $0.0829 | 66,240 | $5,491 | $65,896 |
| Natural Gas ($/Therm) (total usage with delivery) | $0.65 | 19,243 | $12,533 | $150,393 |
| **Water Cost** | | | | |
| Fresh Water ($/1,000 gal.) | $4.76 | 1,765,000 | $8,401 | $100,817 |
| Softener Salt ($/Month) | | | $300 | $3,600 |
| **Wastewater Cost** | | | | |
| Evaporation | 0% | | | |
| Wastewater ($/1,000 gal.) | $8.14 | 1,765,000 | $14,367 | $172,405 |
| Wastewater Surcharges ($/1,000 gal.) | $1.68 | 1,765,000 | $1,667 | $20,000 |
| pH Adjust ($/1,000 gal.) | $0.00 | | $3,500 | $42,000 |
| **Total Operating Cost** | | | **$63,907.24** | **$766,886.84** |

| ULTRAPURE OPERATING COST | | | | |
|---|---|---|---|---|
| **System Parameters** | **Unit Value** | **Monthly Volume** | **Monthly Cost** | **Yearly** |
| Current Wastewater flow (gpm/ gal./mon.) | 117 | 1,765,000 | | 21,180,000 |
| Projected Waste Water flow | 117 | 1,765,000 | | |
| Recycle Water Capacity of Fresh Water (%) | 70% | 1,235,500 | | 14,826,000 |
| Fresh Water gal. /lb | 0.64 | | | |
| ***TOTAL WATER RECYCLING SAVINGS (gal.)*** | | 1,235,500 | | 14,826,000 |
| **Operating Cost** | | | | |
| Electricity (KWH/1,000 gal. Recycled) | $2.26 | 33,617 | $2,787 | $33,442 |
| Cleaning Chemicals ($/1,000 gal. Recycled) | $0.65 | | $800 | $9,600 |
| Liquid Waste Disposal ($/gal.) | $0.00 | | $1,200 | $14,400 |
| **Operating cost ($/1000 gallons Recycled)** | **$3.87** | | **$4,787** | **$57,442** |

| ULTRAPURE SAVINGS | | | | |
|---|---|---|---|---|
| **Ultrapure System Economic Analysis** | **Unit Value** | **Monthly Volume** | **Monthly Cost** | **Yearly** |
| Total Water Savings | $4.76 | 1,235,500 | $5,881 | $70,572 |
| Total Wastewater Savings | $8.14 | 1,235,500 | $10,057 | $120,684 |
| Total Wastewater Surcharge Savings | $1.68 | 1,235,500 | $2,076 | $24,908 |
| Total Energy Savings (therms) | $0.65 | 2,369 | $1,543 | $18,517 |
| Total Washroom Chemical Savings | 12% | | $2,118 | $25,413 |
| **Total Savings** | | | **$24,410** | **$292,919** |
| **Total Net Savings** | | | **$19,623** | **$235,477** |

| | |
|---|---|
| **ULTRAPURE SYSTEM CASH PRICE** | **$683,330.00** |
| **Rebates / Grants** | **$0.00** |
| **Net Cash Price** | **$683,330.00** |
| **Payback (Years)** | **2.90** |