Water and Chemical Use Reduction at Ball Corporation – Saint Paul

Mike Fleming

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Company Supervisor: Amy More

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Company Background

Ball Corporation – Saint Paul

- **Recyclable aluminum packaging**
- **160,000 square foot facility**
  - 110 employees
  - 5 million 12 oz cans per day

Incentives to Change

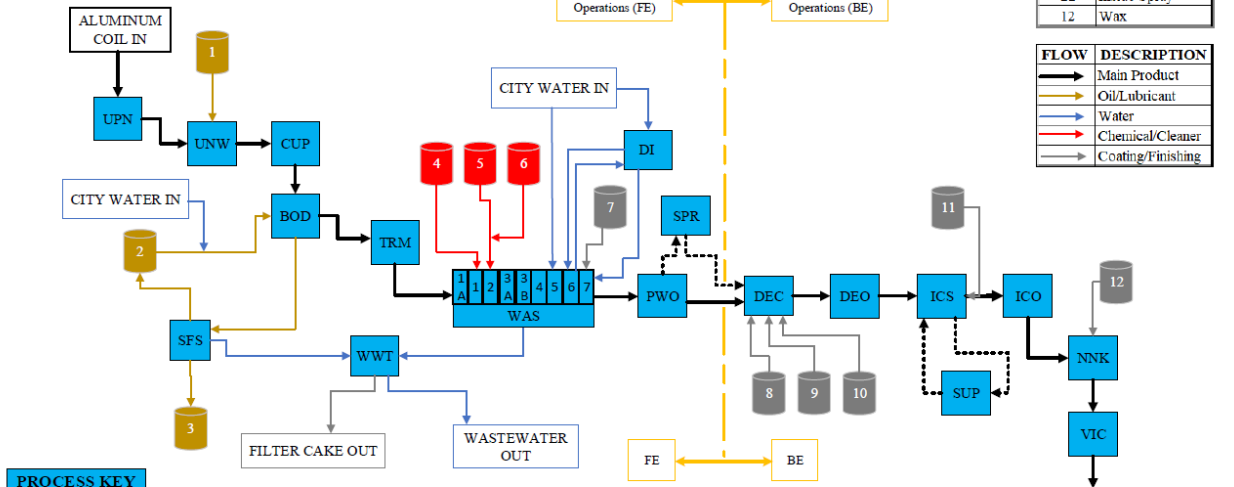
Sustainability Focused Organization

- **Improve water efficiency 50% in beverage packaging plants**
- **Minimize waste to landfill**
- **Reduce GHG emissions 55% by 2030**

www.ball.com/sustainability/product-stewardship/resource-efficiency

PROCESS FLOW DIAGRAM

Ball Corporation- St. Paul



LABEL	DESCRIPTION
1	DTI SNL-2 Cupper Oil
2	Coolant
3	Used Oil Tank

LABEL	DESCRIPTION
4	Sulfuric Acid
5	HF Acid
6	Ridoline 243

LABEL	DESCRIPTION
7	ME-50
8	Decorator Ink
9	Over varnish
10	Bottom varnish
11	Inside Spray
12	Wax

FLOW	DESCRIPTION
	Main Product
	Oil/Lubricant
	Water
	Chemical/Cleaner
	Coating/Finishing

PROCESS KEY

PROCESS	TITLE	PLANT QTY	PROCESS	TITLE	PLANT QTY
UPN	Upender	2	DEC	Decorator	3
UNW	Unwinder	2	DEO	Post Decorator Oven	3
CUP	Cupper	2	ICS	Inside Spray	18
BOD	Body Maker	20	ICO	Post Inside Spray Oven	3
SFS	Schnider Filter	1	NNK	Necker	3
TRM	Trimmer	20	VIC	Visual Inspection Camera	X
WAS	Washer	1	TEC	Light Tester	3
DI	De-Ionizing System	2	SUP	Super Sorter	1
WWT	Wastewater Treatment	1	PLC	Palletizer	3
PWO	Post Washer Oven	1	BND	Bander	2
SPR	Sprial Storage	2			

Ball Corporation - St. Paul
Mike Fleming
Date Created: 6/8/22
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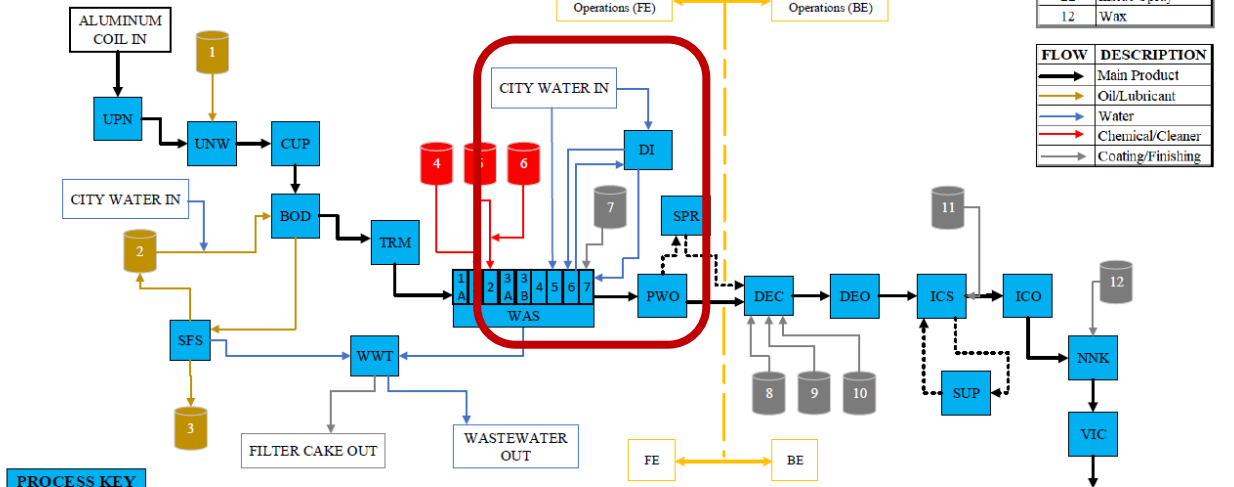

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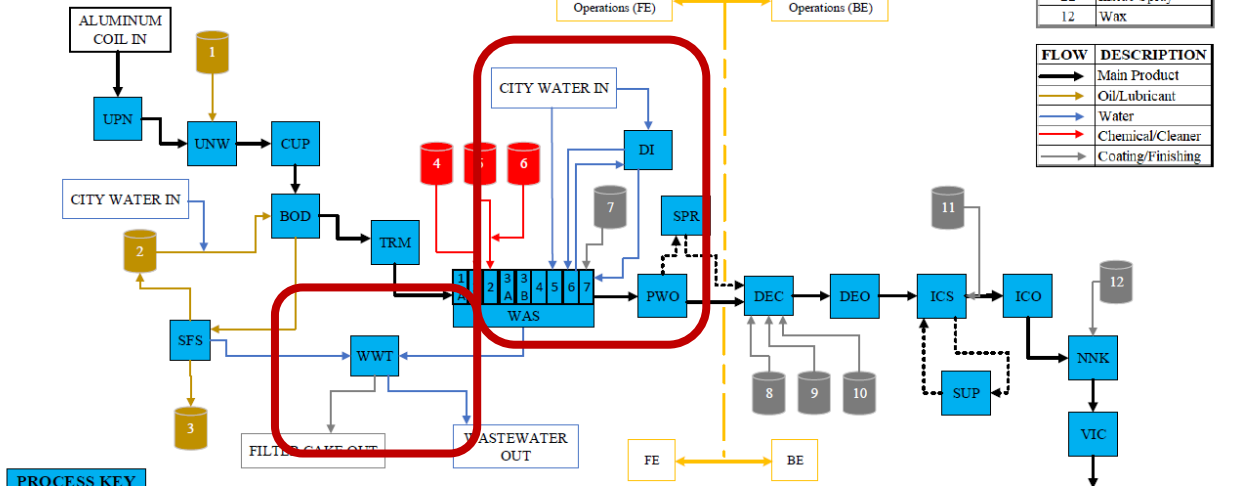

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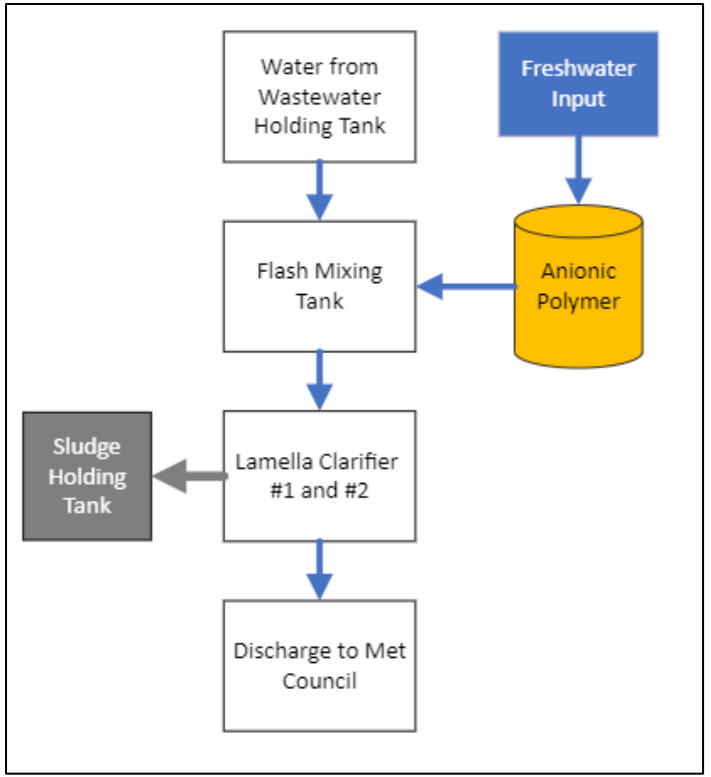
Wastewater Treatment Process

- **Pretreats wastewater discharge**
  - Oil and grease
  - Metal fines
  - Acids
- **Uses both chemical and mechanical treatment**
- **Produces sludge as solid waste**

Water Reuse in Polymer Delivery System

Current System

- Metal fines are removed through flocculation
- Freshwater transports polymer
- Process uses 1,100,000 gallons of water yearly



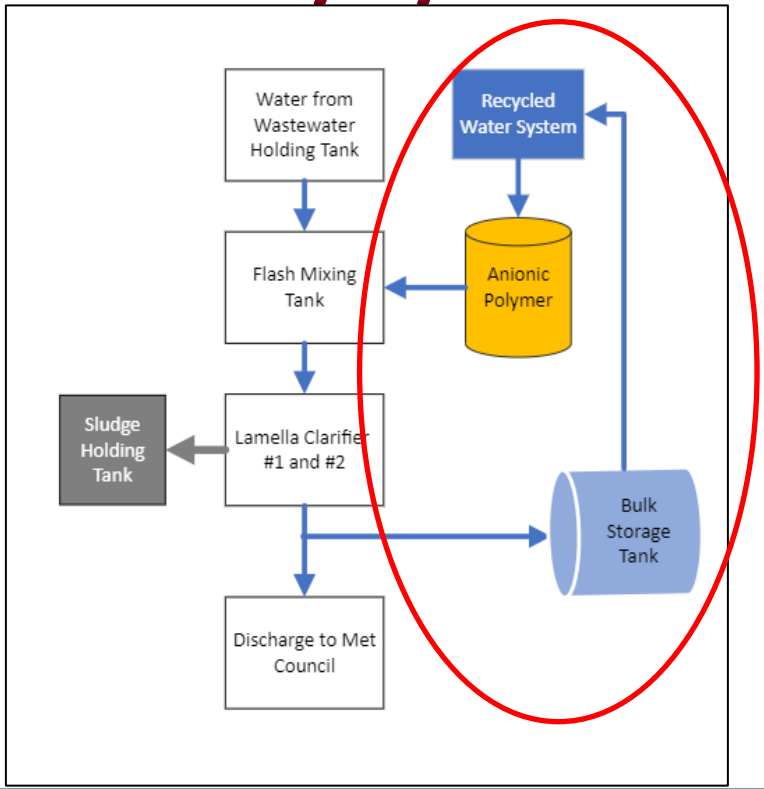
Water Reuse in Polymer Delivery System

Proposed Solution

Reclaimed wastewater transports polymer

Potential savings

- **1,100,000 gallons of water**
- **$10,800**



Can Washer

- Removes oil
- Prepares for printing
- Processes 200,000 cans/hr
- Accounts for 60% of daily water use

Automatic Flow Control Valve

Proposed Solution

Switch from manual to automatic flow adjustment

- **Manual: 17-39 gpm**
- **Automatic: 25 gpm**

Potential Savings

- **1,500,000 gallons of water**
- **$13,800**

Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Recycled Water Use Anionic Polymer System	1,100,000 gal water	$2,800	$10,800	4 months	Recommended
pH Automation	26,000 lbs lime 6,000 lbs sludge	$10,200	Safety	NA	Tentatively Recommended
Automatic Flow Control Valve	1,500,000 gal water	$3,600	$13,800	3 months	Recommended
DI Column Recharge Frequency Adjustment	230,000 gal water 4,800 gal chemical	$0	$7,500	Immediate	Recommended

Personal Benefits

- Professional growth
- Project leadership skills
- Manufacturing process experience
- Aluminum can facts!