

Water Balance and Characterization

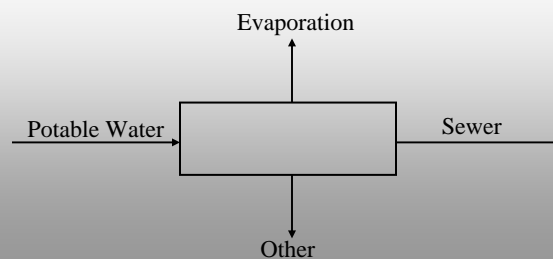
J Chris Stanfill, PE

December 20, 2007

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What is a water balance?

A water balance is simply an equation that describes the water IN and OUT of a system.



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Why perform a water balance?

- Manage water supply (drought)
- Permit renewal
- Process understanding
- Detect leaks
- Troubleshooting

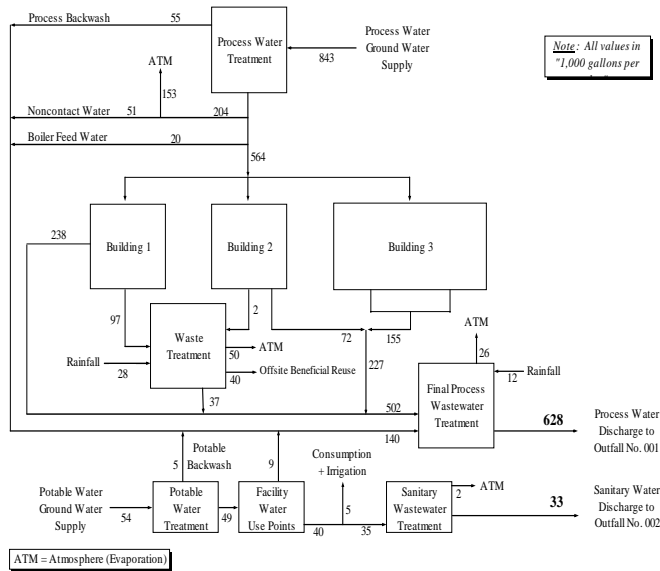
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Where is the water?

- Water In
 - City water
 - Groundwater
 - Surface Water
 - Stormwater
- Water Out
 - Sewer
 - Evaporation
 - Manufacturing products
 - Leaks
 - Land Application / Irrigation
 - Surface Water

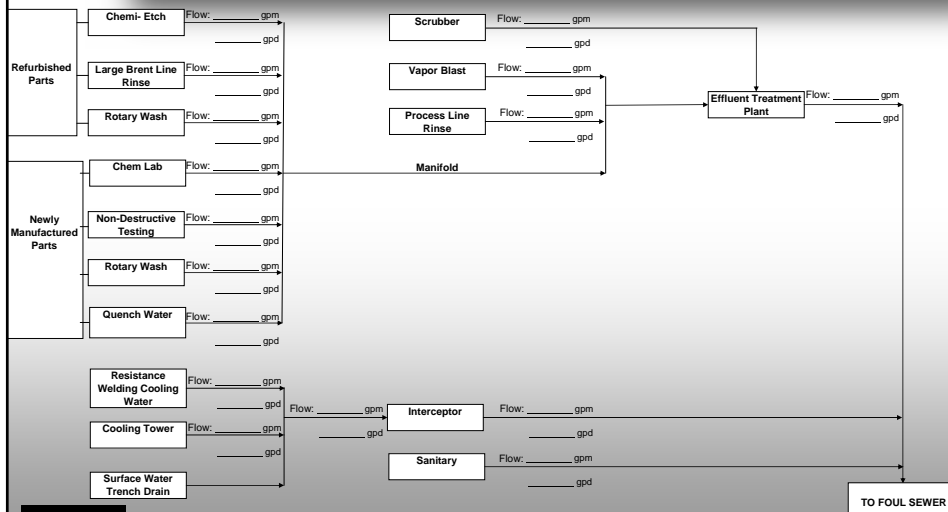
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Sample Water Balance



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Sample Water Balance



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Flow Measurement

■ Flow meters

- Permanent meters
 - Mag-meters
 - Mechanical (turbine & paddle wheel)
 - Ultrasonic (doppler and transit time)
 - Weirs & Flumes
- Temporary meters
 - Doppler (dirty water)
 - Transit Time (clean water)
 - Turbine
 - Weirs

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Flow Measurement

■ Container and stopwatch

- Use a container of known volume or graduate with a known volume
- Record time it takes to fill
- Calculate flow rate

■ Facility records.

- Utility bills
- Wastewater DMRs
- Hauling manifests

■ Literature Values - Metcalf and Eddy

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What is Wastewater Characterization?

Wastewater characterization is simply a mass balance, an equation that describes the mass of an individual compound IN and OUT of a system.

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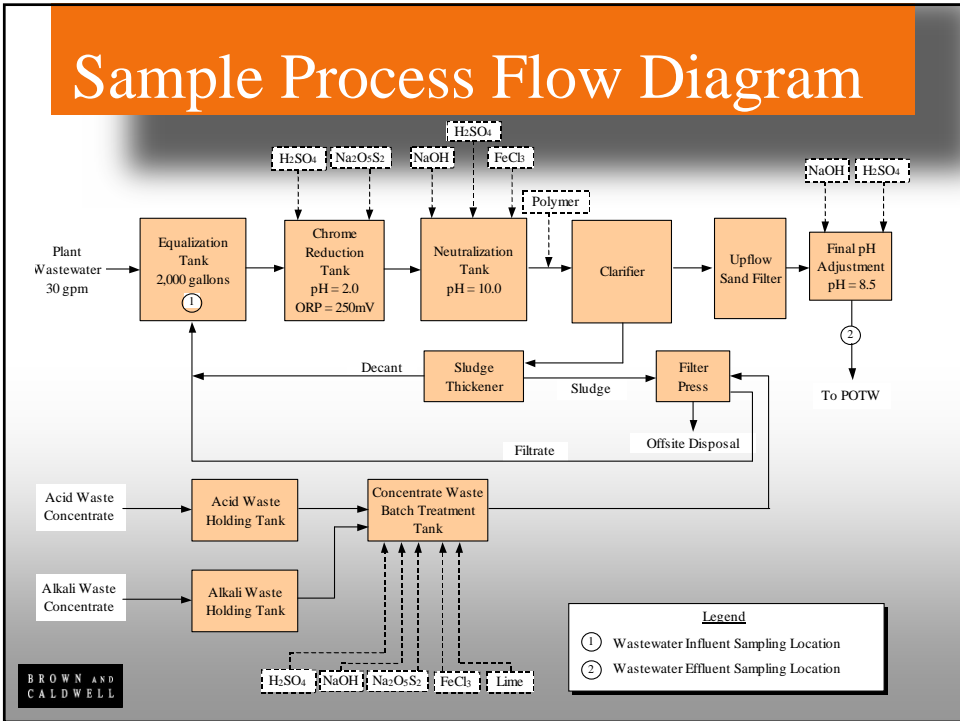
Why perform a wastewater characterization?

- Process understanding
- Troubleshooting
- Waste minimization
- Permit renewal
- WWTP upgrade

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Sample Characterization Matrix

Parameter	Total Aluminum	Total Antimony ¹	Total Beryllium ¹	Total Chromium ¹	Hexavalent Chromium	Total Copper ¹	Total Iron	Total Lead ¹	Total Nickel ¹	Total Selenium ¹	Total Silver ¹	Total Tin ¹	Total Vanadium ¹	Total Zinc ¹	Free Cyanide ²	Oil and Grease	Suspended Solids ²	Sulfates, as SO ₄ ¹	pH ¹	Temperature ¹	Instantaneous Flow ¹	Daily Average Flow ¹
Sample Location																						
Chemical Etch Rinse Tank	X					X	X	X								X	X	X	X	X	X	X
Large Brent Line Rinse	X					X		X								X	X		X	X	X	X
Rotary Wash for Refurbished Parts	X					X		X								X			X	X	X	X
Chemical Lab	X					X		X										X	X	X	X	X
Non-Destructive Test-Fluorescent Dye Rinse	X					X		X		X						X	X	X	X	X	X	X
Rotary Wash for Newly Manufactured Parts	X					X		X								X			X	X	X	X
Quench Water from Newly Manufactured Parts	X					X		X								X			X	X	X	X
Resistance Welding Cooling Water	X					X		X								X			X	X	X	X
Cooling Tower	X					X		X											X	X	X	X
Interceptor	X					X		X								X	X	X	X	X	X	X



Questions?

J Chris Stanfill, PE

770-673-3640

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