

Conserve water, save lives at Abbott – Little Canada, MN

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Driven to DiscoverSM



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Company Background

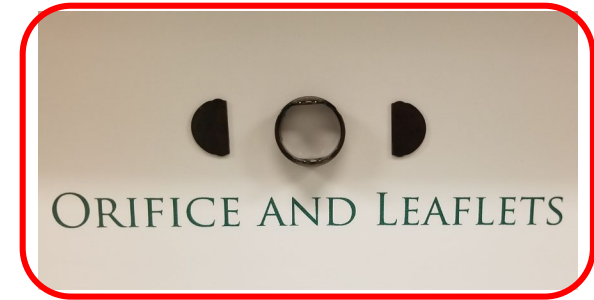
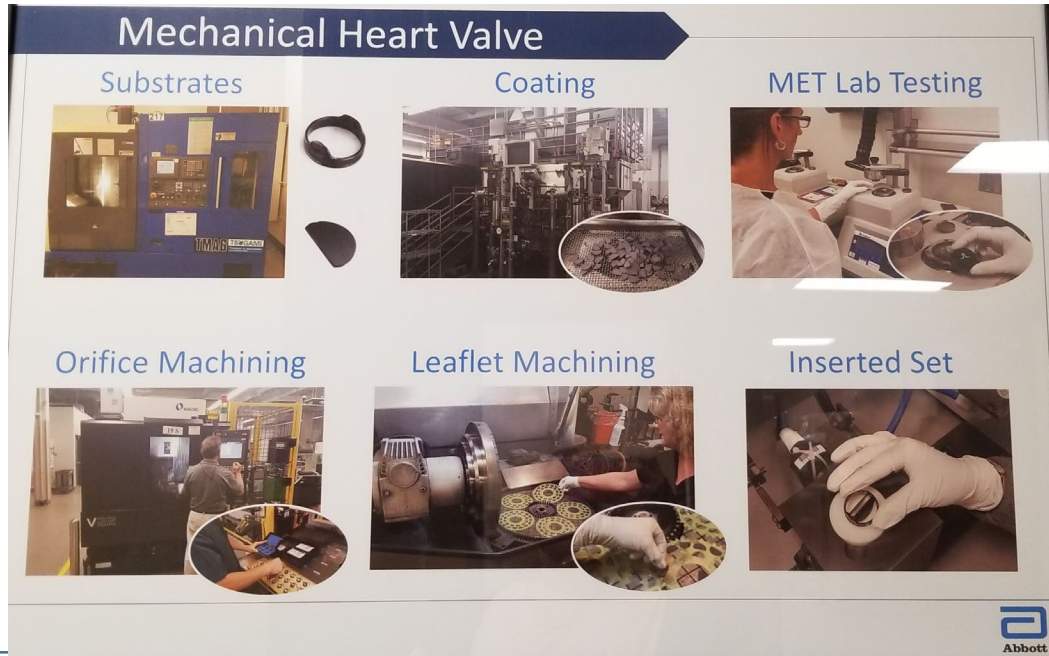
- Multinational medical device and health care company
- Founded by physician Wallace C. Abbott
- More than 130 years making people's lives better

Woodridge Site

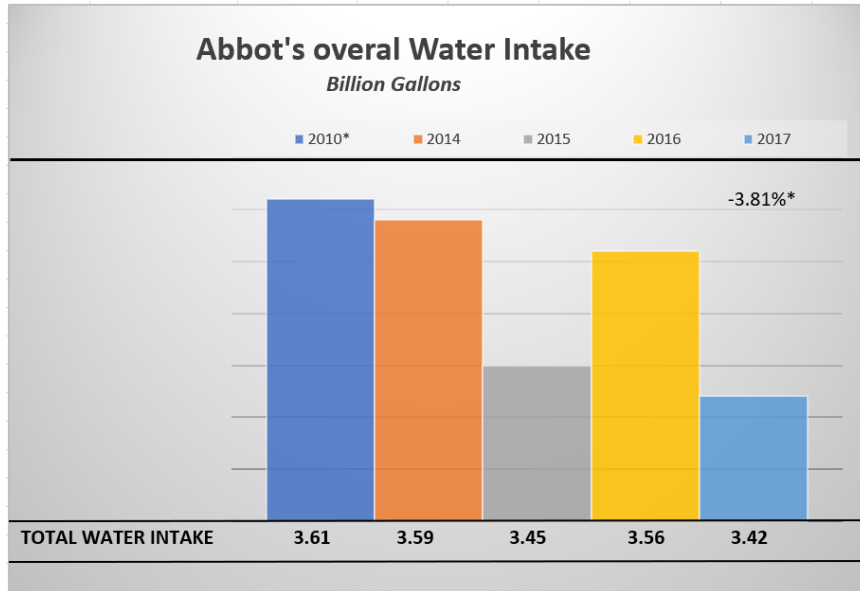
- Part of the Structural Heart division
- Around 450 employees



Main Product



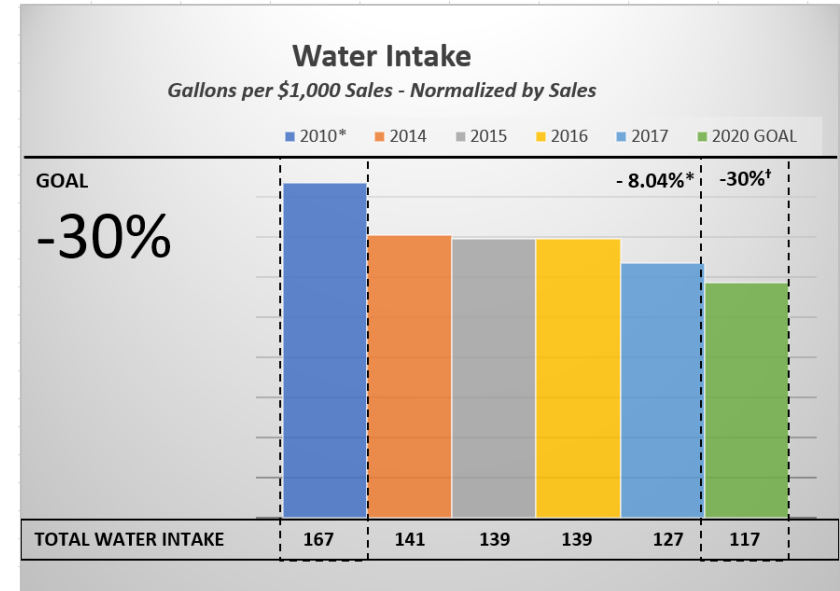
Motivation



* Baseline year

%* Change from 2016 to 2017

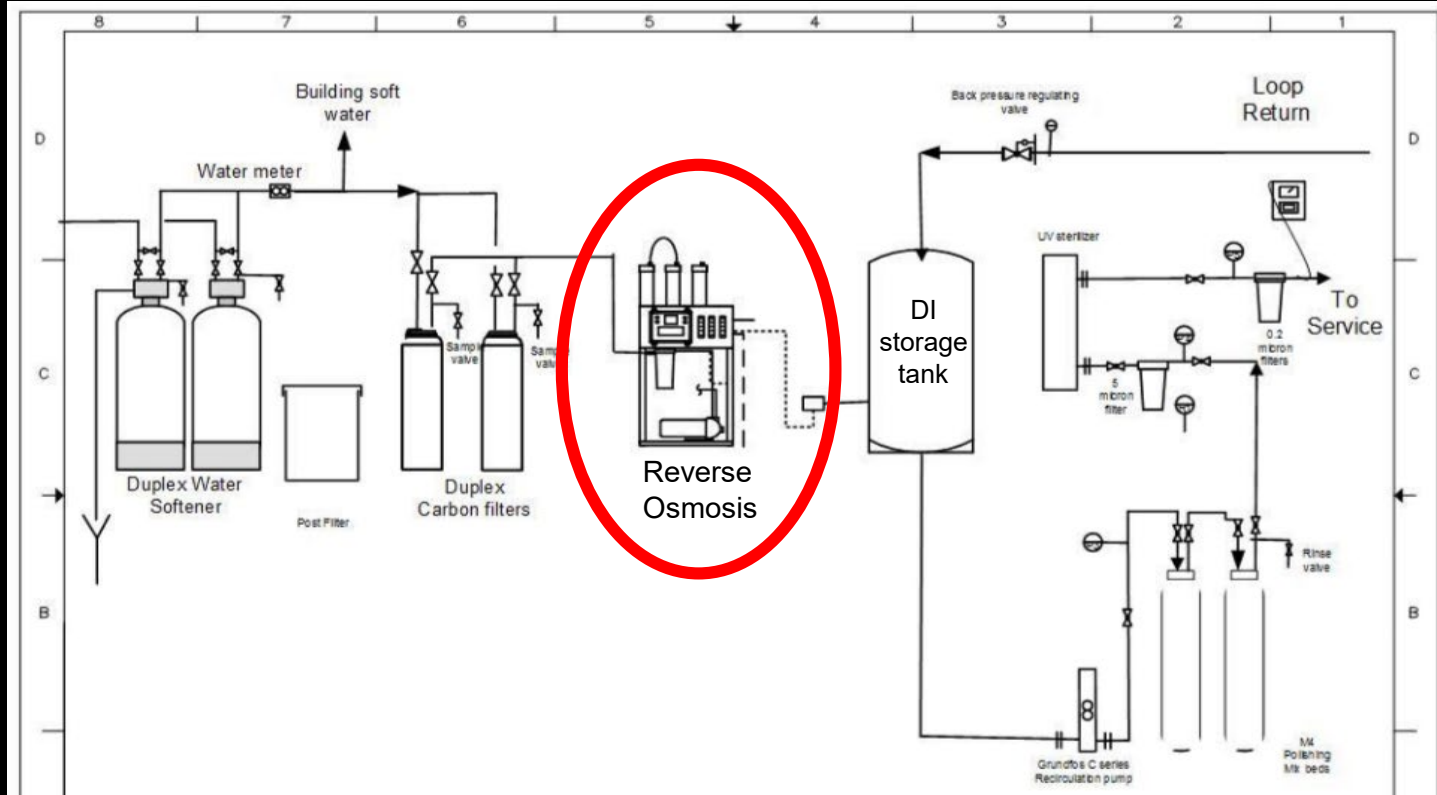
%† Change from 2010 (goal)



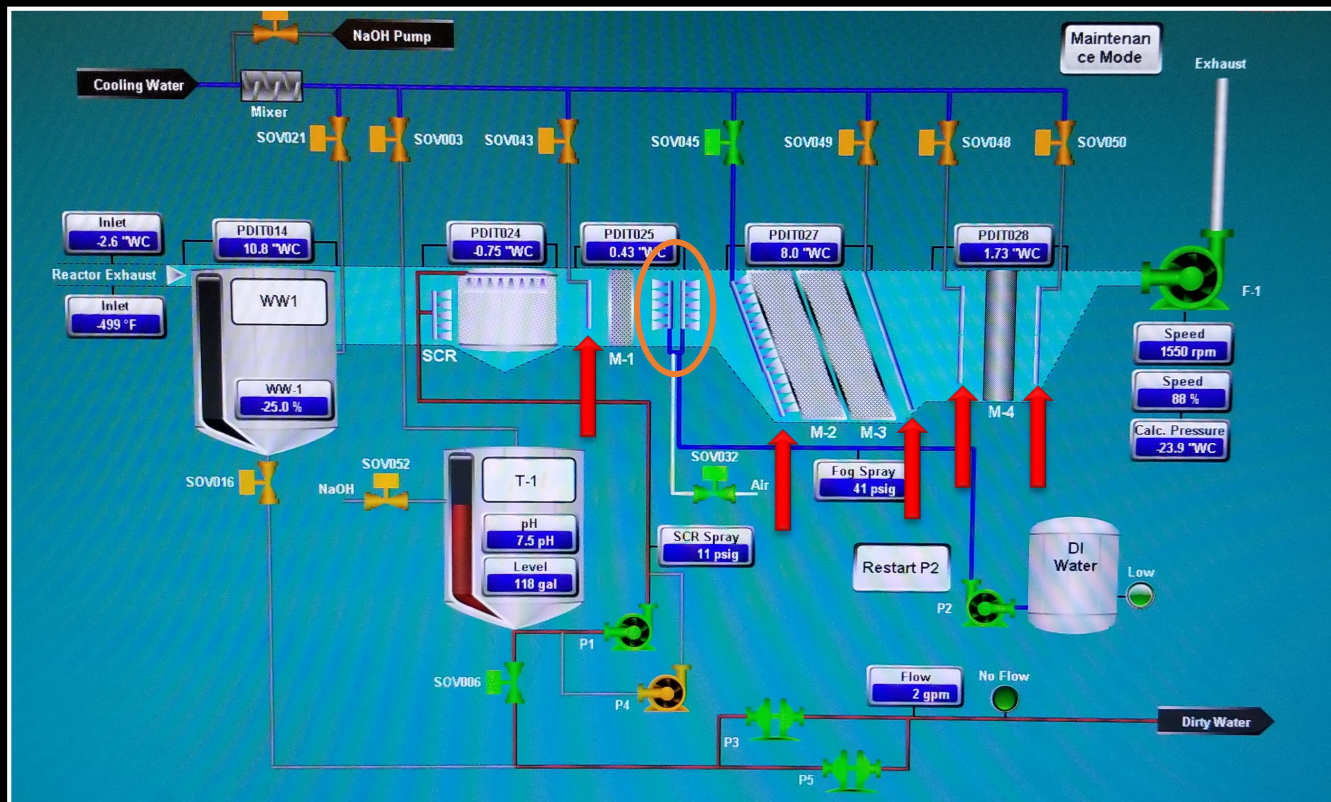
Water purification



The diagram illustrates a wastewater treatment process. It begins with 'Cooling Water' entering a 'Mixer' (SOV021) and 'NaOH' being added from a 'NaOH Pump' (SOV051). The mixture flows through a series of pumps (SOV003, SOV043, SOV045, SOV046, SOV048, SOV050) into a 'Reactor Exhaust' section. This section includes a 'WW1' tank with a 'pH 10.8 °C' and a 'WW.1' tank with a 'pH 25.8 %'. The flow then passes through a 'SCR' unit (SOV016) and a 'T-1' tank (SOV052) which has a 'pH 7.5 pit' and a 'Level 110 gal'. The treated water then flows through a series of pumps (SOV006, SOV003, SOV004, SOV005) and a 'Flow 2 gpm' meter into a 'Dirty Water' output. The diagram also shows a 'Maintenance Mode' button and an 'Alarm' indicator.



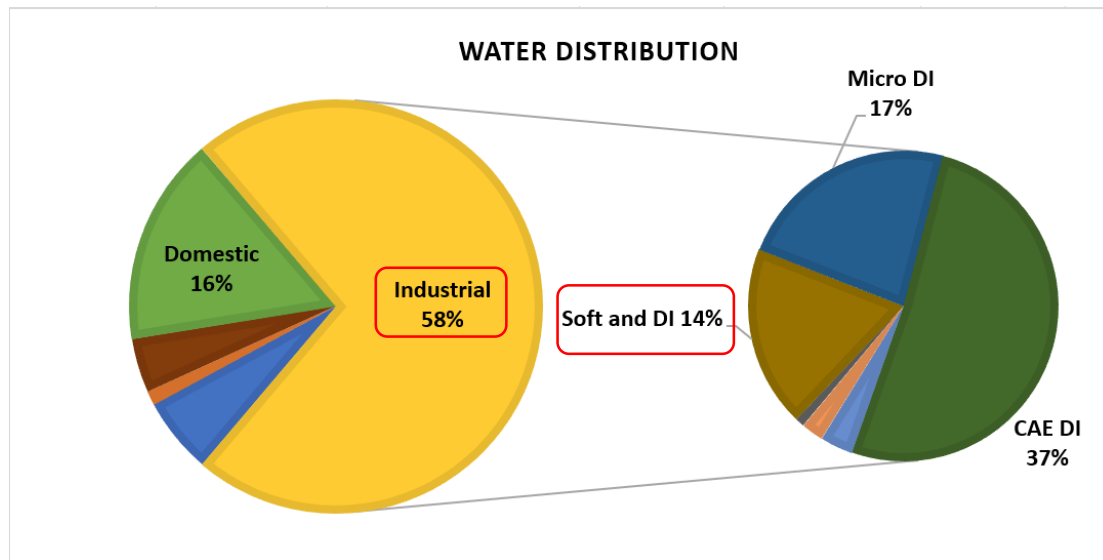
Water purification



Air purification

Approach

- Mapping and categorizing water use
- Learning water treatment system
- Working with vendors



Reverse Osmosis Optimization

Present Situation

- Reverse osmosis percent recovery is 48% and there is the opportunity to increase it up to 75%

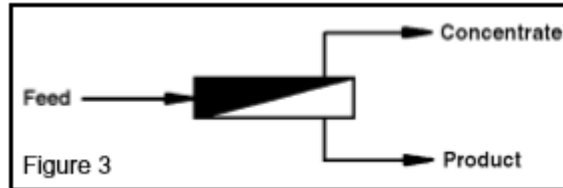
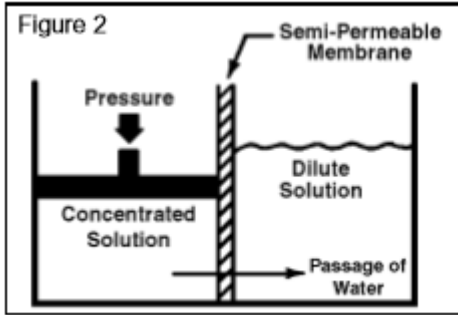
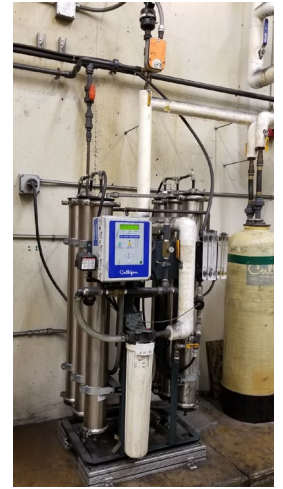


Figure 2 & 3 retrieved from: Aqua-Clear Installation and Operation Instructions



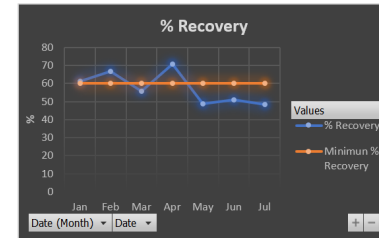
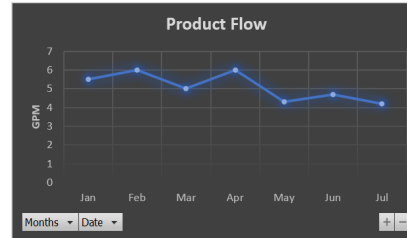
Recommendation

- Replace membranes
- Check system pressure and % recovery regularly

Reverse Osmosis Operating Parameters

Parameters	2011	2020
Feed Temperature (°F)	68	75
Feed Pressure (psi)	56	70
R.O. Pressure (psi)	120	170
Product Flow (gpm)	6	4.2
Waste Flow (gpm)	3	4.5
Product TDS (ppm)	3.6	3
Feed TDS (ppm)	208	212

RO SYSTEM CHECK



Membranes need to be replaced. Call Culligan to check the system

Date	Feed Temperature (°F)	Feed Pressure (psi)	RO Pressure (psi)	Prod Flow (gpm)	Waste Flow (gpm)	Prod TDS (ppm)	Feed TDS (ppm)	Hours	% Rejection	% Recovery
Mar-20	50	66	130	5	4	2.7	212	24174	98.7	55.6
Apr-20	52	64	140	6	2.5	3.9	216	24345	98.2	70.6
May-20	61	55	141	4.3	4.5	3	212	24567	98.6	48.9

Results

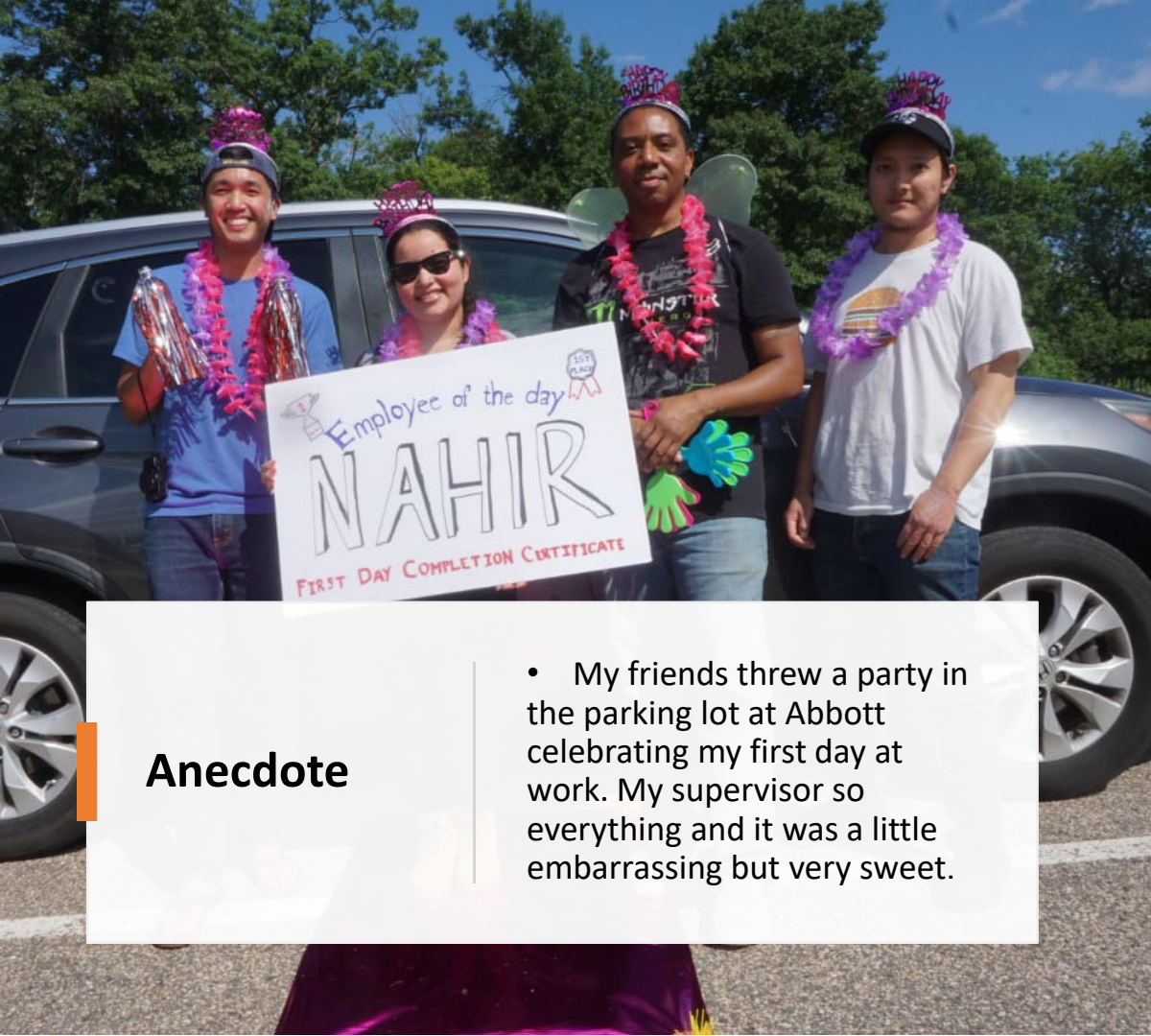
Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Reverse Osmosis Optimization	560,000 gal water 2,200 kWh	\$2,900	\$4,420	8 months	Recommended



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Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Reverse Osmosis Optimization	560,000 gal water 2,200 kWh	\$2,900	\$4,420	8 months	Recommended
Reuse wastewater from Reverse Osmosis	250,000 gal water	N/A	\$1,850	Immediate	Under review
Fog Chamber Optimization	575,000 gal water 9,800 kWh	Needs further analysis	\$5,200	TBD	Under review
Rinsing time for scrubber filter optimization	TBD	TBD	TBD	TBD	Investigating



Anecdote

- My friends threw a party in the parking lot at Abbott celebrating my first day at work. My supervisor so everything and it was a little embarrassing but very sweet.

