

# Operator Example

## Dissolved Air Flotation

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# Dissolved Air Flotation Example





# EQ Tank—Pump/Mixer Feed



- Grease/oil pumps/mixers, clean area, seals, top-bearing, LISTEN
- Electrical connections to flow meter/system, timers, synch with flow from digester/screen, emergency overflows

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- Repair seal, top-bearing of pump

# Dry Polymer



- Order schedule, semi-annual re-assessment of polymer choice/jar tests, front-end loader delivery, haul 50 lb. bags up stairs
- Chemical safety, handling, clean-up

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- NA

# Dry Polymer Dosing



- Daily addition to hopper, check wetting screw—sometimes build-up, improper wetting, check vibrator operations
- Dry auger feed, wetting screw, vibrator for non-bridging concepts

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- Replace auger motor and paddle

# Polymer Solution Make Down



- Check flow/quality of three tanks, 3-mixer motors/mixer shafts, build-up, oil
- Principles/goals behind wetting, make-down, fish-eyes, good/bad quality, consistency, curing time, etc.

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- Fix mixer shafts connections



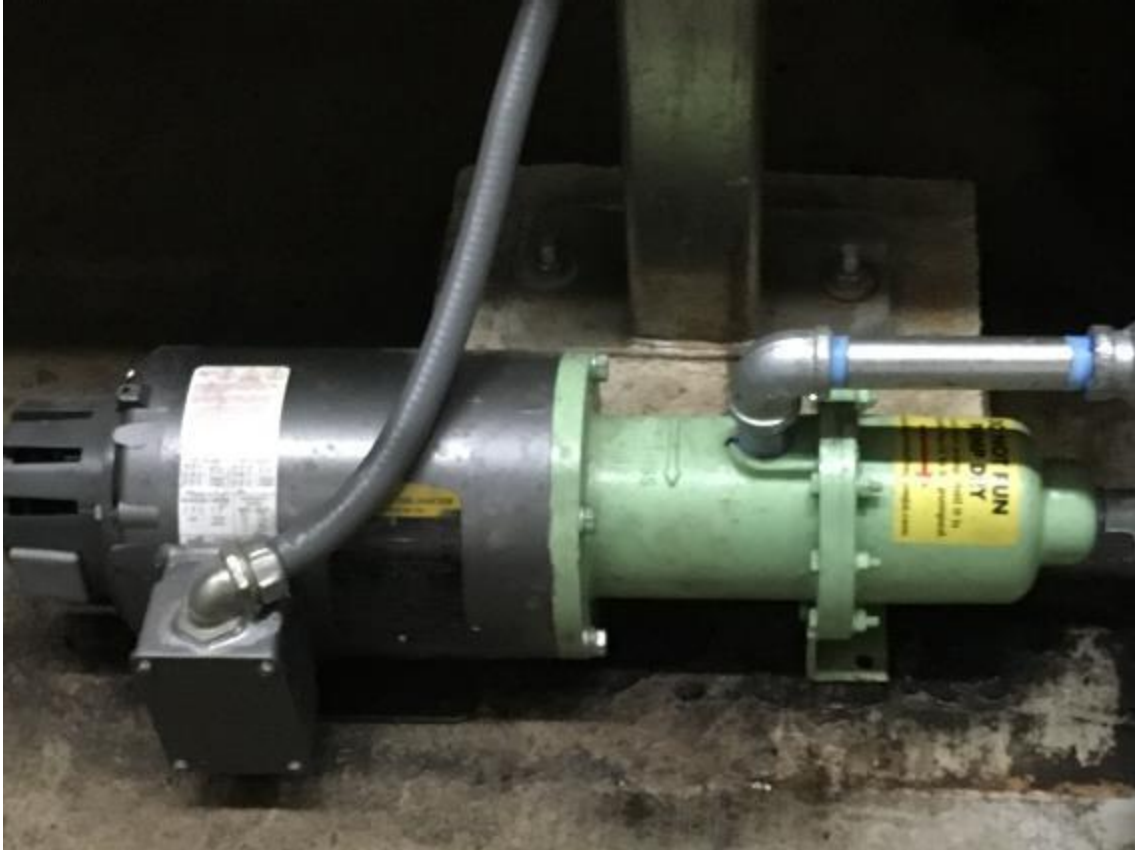
# Polymer Control Panel



- Observe correct pre-sets, no faults (A-17)
- Aware of key control operations/settings, how to adjust accordingly, monitor

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- NA

# Polymer Solution Feed Pump



- Observe good working condition
- Know operations of progressive cavity pump, cannot run dry

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- New pump, rubber stator wear (chrome coating)—back-flow concern



# Manure Feed Control/Control Panel



- Observe operating within desired presets, adjust accordingly, no faults, solids height (30"), flow meter (65 gpm)
  - Aware of control/feedback system, linking flow meter/pump rate, polymer/system shut-off, restart
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- Calibrate, re-engineer flow meter controls for better shut downs

# Mixing Tube



- Don't adjust unless have to adjust, check if diaphragms have hole/plugged—open valve to release; periodic jar test
  - Principle of manure/polymer/air mixing—velocity, turbulence, residence time, dilution, insertion zone, pressure, etc.
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- Replace diaphragms

# Micro-Air



- Check pump (120 psi), pressure into tanks (60 psi), pre-set air flow rates (18 cfm/6 cfm), seals, oil/grease, filter changes, check air nozzle/diffusers, check accuracy of flow meters, general working condition
  - Principle of production of micro-air and its insertion into the system.
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- Clean-out air diffusers, installed different flow meters



# DAF Tank



- Check sight-glasses for proper sludge layer, gas release, check condition/speed of skimmers, adjust accordingly, grease
- Daily settled sludge purge; struvite/scale cleaning
- Understanding of optimal sludge/air/flow speed settings and adjustments.

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- NA



# Sludge Hopper



- Observe normal release of solids to hopper, correct depth in hopper, operational laser meter
- Concept of head pressure on dewatering presses, factors impacting laser meter

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- NA

# Moving Disc Dewatering Presses



- Observe good operating condition, spacings, wear/tear, product quality, timing, cleaning system, periodic adjustments to pre-sets, eventual re-calibration of presses
  - General principle of moving disc theory and operation and ramp up/down on hopper level
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- Turn off wash, to save water, hose down once in morning

# Solids Handling



- Observe quality of product and production, front-end loader to move, cleanliness of area, observe/test quality of solids/effluent
- Front-end loader certification, safety training

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- Install effluent flow meter—interesting science problem involved



# Check List

Parameter	Solids level window 1	Solids level window 2	Polymer dosing pump running	Electrical Cabinet Temperature	Solids level on sensor	Current GPM flowrate	Total gallons to DAF / Difference from last time recorded	Total Gallons to Lagoon / Difference from last time recorded	Total Gallons Water to DAF / Difference from last time recorded	Check solids hopper	Check skimmers	Skimmer gear box oil level	Add polymer	Clean polymer feed auger	Check polymer holding tanks	Polymer feed HZ	Mixing pump oil level	Mixing tube air pressure	Mixing tube liquid pressure	DAF mixing tube air pressure	DAF mixing tube liquid pressure	Air compressor pressure	Air compressor oil level	Oil level on dewatering gearbox	Check mixing tupe vents	Check solids	Drain botto DAF ports	Completed By	Time	
	OK	OK	OK	80-110	OK		Gallons	Gallons	Gallons	OK	OK	OK	OK	OK	OK		OK		70-100	70-100	140-160	OK	OK	OK	OK	OK	OK	BVL		
Monday	35%	100%	✓	72	30	66	1758460 97040	✓	43984 942	✓	✓	✓	1	✓	✓	4.1	✓	21	64	6	62	160	✓	✓	✓	✓	✓	✓	DB	8:45
Tuesday	50%	100%	-	63	0	0	1837432 79038	✓	44744 610	✓	✓	✓		✓	✓	6	✓	0	0	0	0	140	✓	✓	✓	✓	✓		AH	7:50
Wednesday	45%	100%	-	65	0	0	1925847 88026	✓	45091 897	✓	✓	✓	2	✓	✓	0	✓	0	0	0	0	145	✓	✓	✓	✓	✓	✓	DB	11:00
Thursday	40%	100%	-	77	30	66	1978270 52428	✓	46066 475	✓	✓	✓	1	✓	✓	4.1	✓	20	64	3	62	150	✓	✓	✓	✓	✓	✓	DB	8:30
Friday	40%	100%	✓	84	30	65	2056800 78590	✓	47846 880	✓	✓	✓	1	✓	✓	4.1	✓	20	63	3	62	160	✓	✓	✓	✓	✓	✓	DB	8:30
Saturday	50%	100%	✓	78°	30	65	2151100 94,300	✓	48019 973	✓	✓	✓	1	✓	✓	4.1	✓	20	64	3	62	160	✓	✓	✓	✓	✓		LF	8:30
Sunday	40%	100%	✓	78°	30	64	226920 78820	✓	48692 673	✓	✓	✓	1	✓	✓	4.1	✓	20	66	3	61	160	✓	✓	✓	✓	✓		LF	8:30



# Team

Andy Hanson



- O&M Regional Manager
- 7 years w/ company
- Grew up on dairy
- Certified electrician/HVAC and former owner electric company
- Supervises various levels of O&M at 6 facilities

Todd Andrew



- O&M Technician
- 25 years w/company
- AA HVAC/Refrigeration
- Decades diesel engine experience
- Senior tech lead on various levels of O&M at 6 facilities

Lucas Fakkema



- Technician
- AA Welding

Phil Losier



- Technician
- 24-years Navy

Doug Bajema



- Technician
- Retired dairyman