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Portage Creek.
Springfield Belle mods. VFDs on pumps.

SW suggest Road Trip to look @ Belle.
for entire set of recommended repairs.

Burning out process pressurization pump.
due to throttling of discharge.

Stw is coordinating electrician to
Belle shop repairs.

Will need SRD for Precip

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Site Visit to Springfield Bolle:

- Review flow diagram against actual. Identify any discrepancies.
- Review system for adequacy for use at Portage CIC. for treatment of water from solidifying pad.
  - Identify any additional equipment may be necessary to facilitate treatment.
- STU's Request:
  - Look at system to see how it can best be hydraulically cleaned out
    - Will we need an external tank?
  - Look at system to see if pumps in system match whats in manual.
  - Look at upgrades list
  - Look at what it would take to automate system.

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OBJECTIVE -

Review the Springfield Belle.

Identify best way to provide water & recirculation capability for system clean out.

- For electrical diagnostics
- For identification of leaks.

OBSERVATION

Exterior to the S.B., typically there is a raw water collection tank or sump & sump pump that feeds water into the S.B. The water passes through the bag filters prior to entering the surge tank.

TO TEST THE SUMP PUMP & BAG FILTER HOUSING.

- Use external tank of 200-500 gal.
- Fill w/ water
- Use sump pump
  - Push water through bag filter housing into Surge Tank.
- After external tank is empty, leave in place.

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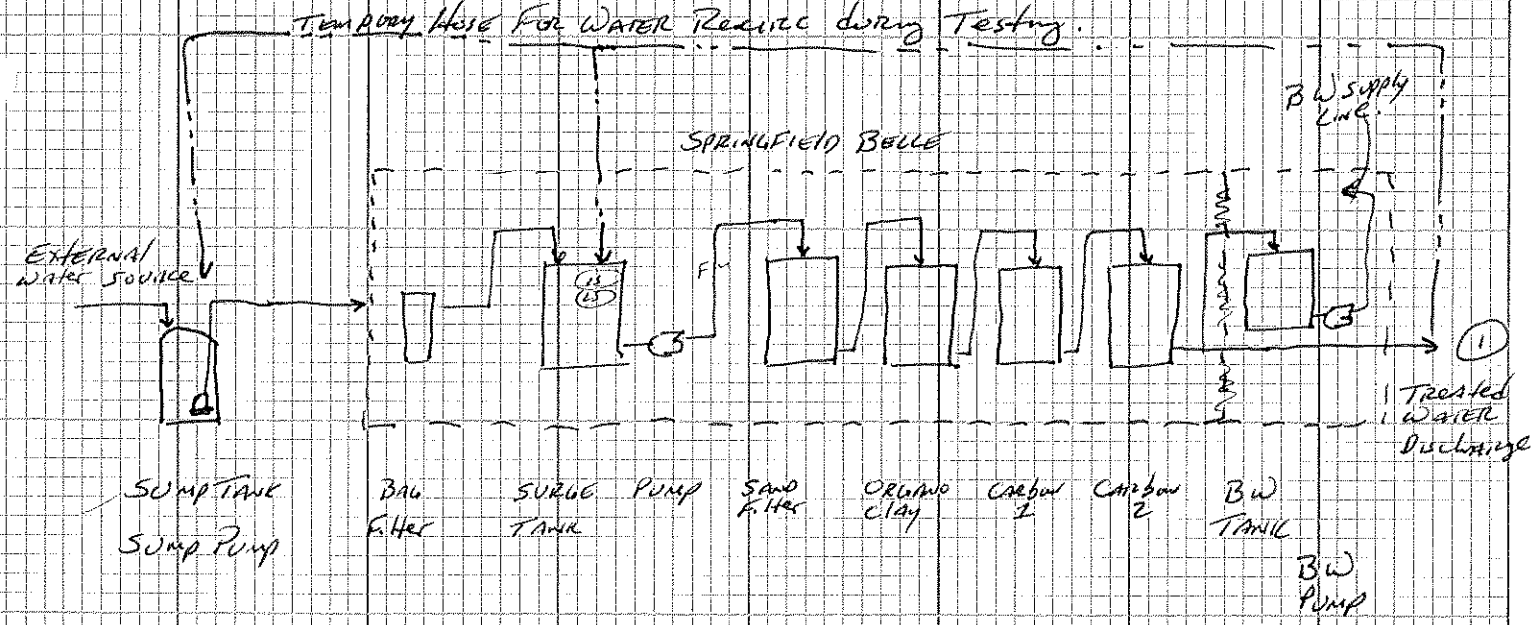
Use external water source:
Hose or bring in water.

Fill: Surge Tank
~~Car~~ Sand Filter
Organo Clay Tank
2 Carbon Filters
Backwash Tank.

Provide a Spent Backwash Hold Tank of Equal Size as Backwash Tank.



To Provide Recirculation of Water During Testing:

1) Install Temporary Hose from Treated Water Discharge back to Surge Tank OR

2) Install Temporary Hose from Treated Water Discharge back to Sump Tank. (only if cant get into Surge Tank).

(1) Add duplex bag system for 0.5 - 1.0 particulate filtration prior to discharge.

(2) Aeration may be required to raise D.O. after carbon. Can use: · Blower & diffuser in a tank OR. Cascade over tortorous path.

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TO TEST BACKWASH.

- FILL BACKWASH TANK
- ASSURE FILTER VESSELS FULL
- FILL PIPES PRIOR to RUNNING PUMP, LOCATE ANY bleed VALVES & REMOVE AIR.

- TEST BACKWASH ON EACH VESSEL, ONCE AT A time:
  - ARRANGE plumbing so that:
    - BW TANK to
    - BW Pump to
    - EACH of
      - ORGANIC Clay
      - SAND FILTER
      - CARBON 1
      - CARBON 2
  - ON BW outlet HORIZONTAL PIPE above valve tree, REMOVE FLANGE on RIGHT side & RETURN water to BW TANK w/ temporary hose.
    - THIS will provide BW RECIRC loop for testing
  - ASSURE valving on BW outlet line to flows towards REAR of trailer IS valved closed or temporarily blind flanged off.
  - AT Completion of BW Pump & BW TEST on All vessels, RETURN plumbing to initial condition.

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Evaluation of Springfield Belle for Adequate Treatment at Portage Creek.

As Provided For Portage Creek	Springfield Belle	Comments
· Flow Equalization Tank	None	Frac Tanks As Needed
· Particulate Filtration	2 · Bag Filter Housing Sand Filter	(1) (2)
· Organo Clay	Suitable	
· 2-Stage Carbon	Suitable	
· Post-Filtration	None	(3)

(3) Utilize duplex set of bag filters @ 0.5 to 1μ for filtration of any carbon particulates.

(2) If BAGS of 5-10μ can be used, may not need sand filter

(1) Particulate filtration should be to ~5μ before clay/carbon. If visible sized solids evident, use a Settling Tank to knock out solids. Play with Filter Bag Size as needed & attempt to obtain sand filter in 10-20μ size.

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1 & 2 BW Pump Flow Meter - Needs Repair Replacement
Flow Control Inc, Burbank CA.
Signet Scientific 3" Pipe.

- Meter can only be seated in 2 positions.
- Mtr does not have flow direction arrow.
- JW 4/3/12 Removed paddle wheel.
  - Clean & spins freely.
  - Replace into socket, same direction as removed.

1) When checking out flow meter,
- Assure all air removed from line,
- If not reading, try reversing in socket.
- Put pulse/4-20 ma on meter.

- Rent a clamp on flow meter to:
  - Check pump flow rate.
  - Confirm meter reading properly

Pump Spec.
120 gpm @ 40' TDH (17.3 psi)

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(3) Influent Pump Breaker Box Needs to be Replaced

Test Out Pump to see if 50 gpm. ? TDH.

Replace Pump & Provide Motor Starter w/ VFD

Also suggest Electronic MAG meter w/ signal to controller.

Operator inputs target flow.

Flow meter sends flow signal to Flow Controller.

Flow Controller RAMPS up/down pump to achieve target flow rate

Pump has 2" PVC pipe.

Install 2" MAG METER in LINE (vert upward)

locate Flow Controller @ office

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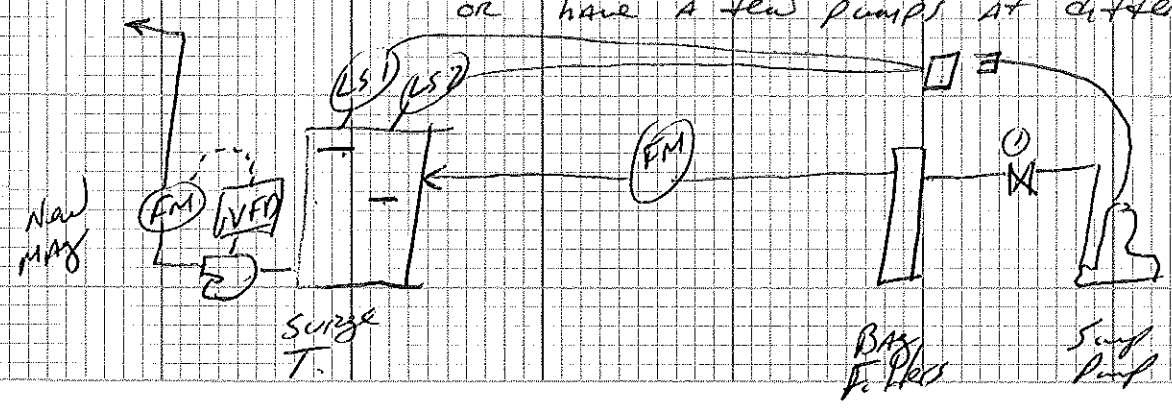
(4) Influent Pump Wiring System needs to be checked at back of trailer (float system & wiring for influent pump to surge tank does not function properly).

- Electrician to:
  Check float in Surge Tank
  - Assure float actually floats
  - Contacts make when float floats.
  - Signal relayed thru float/relays
  - Signal at back of trailer from floats is verified & terminates when float makes.
  - Signal to turn off P-1

Instead of a single float in surge tank, maybe 2, one at full to turn off P-1 & one @ 2/3 full to allow P-1 to turn back on. Will prevent P-1 from having to be throttled back.
- APPEARS 2 floats exist.

If 2 float system not accepted, try:
Replace P-1 w/ smaller pump, MAX 50 gpm.
~~Throttle~~ · Can still throttle, just not as much needed.
or have a few pumps at differing flow rates.



(1) Throttle Valve so FM = FM MAX for VFD.

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5) Back Up Influent Pump Needs Repair (Does not turn when powered up). Not sure which pump this is. Sump Pump?

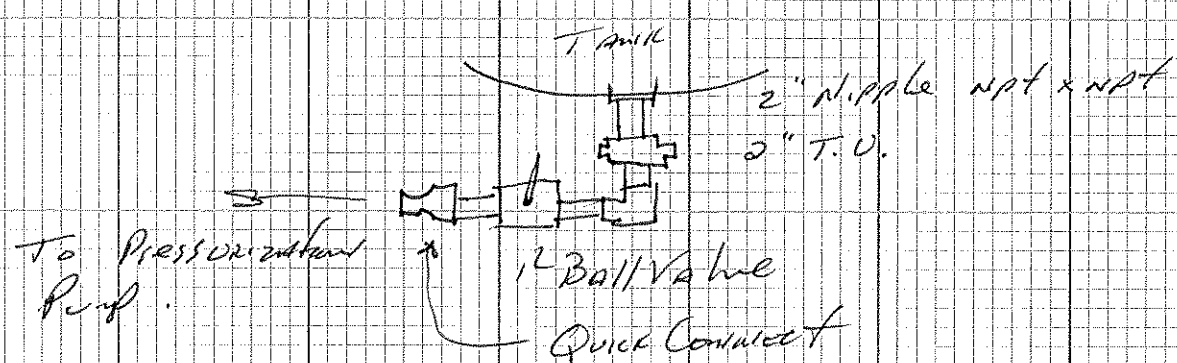
- Electrician -
  - Check for free rotation (assure pump not frozen up from corrosion).
  - Check wiring
  - Check coupling.
  - Check impeller ~~[illegible]~~ wear

6) Surge Tank valve & piping to boost pump needs to be replaced (threads on piping and valve are corroded, unable to thread new fittings in properly).

2" Plastic Bulkhead fitting @ bottom of tank w/ nipple & 90°El that appears to be steel.

The 90°El, nipple, & gate valve are such that they cannot be removed without cutting off.

- Cut of piping so that threaded nipple can be removed from bulkhead. Assure can still get pipe wrench on remaining stub
- Install a new 2" Threaded nipple w/ 2" True Union.
- Prep rest of assembly (can reuse what was removed or replace)



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(7) Effluent Flow Meter & Totalizer Do Not Function Properly.

- Remove Totalizer & flowmeter from the horizontal pipe as insufficient upstream straight length of 10x DIA (@ 2" = 20") & 5x DIA downstream (5 x 2" = 10").

- Suggest: Paddlewheel Style FM in vertical up pipe w/ Digital Flow & Analog Totalizer w/ output signal back Effluent Flow/Totalizer @ 'office' panel.

Electricians verify proper signals.
Can calibrate against clamp on flow meter (used for BW flow ck).