

**LOWeFLOW™ w/UV System Design**  
**Manual**  
**August 2017**

**Manufactured and Marketed by:**  
**Lowridge Onsite Technologies, LLC**

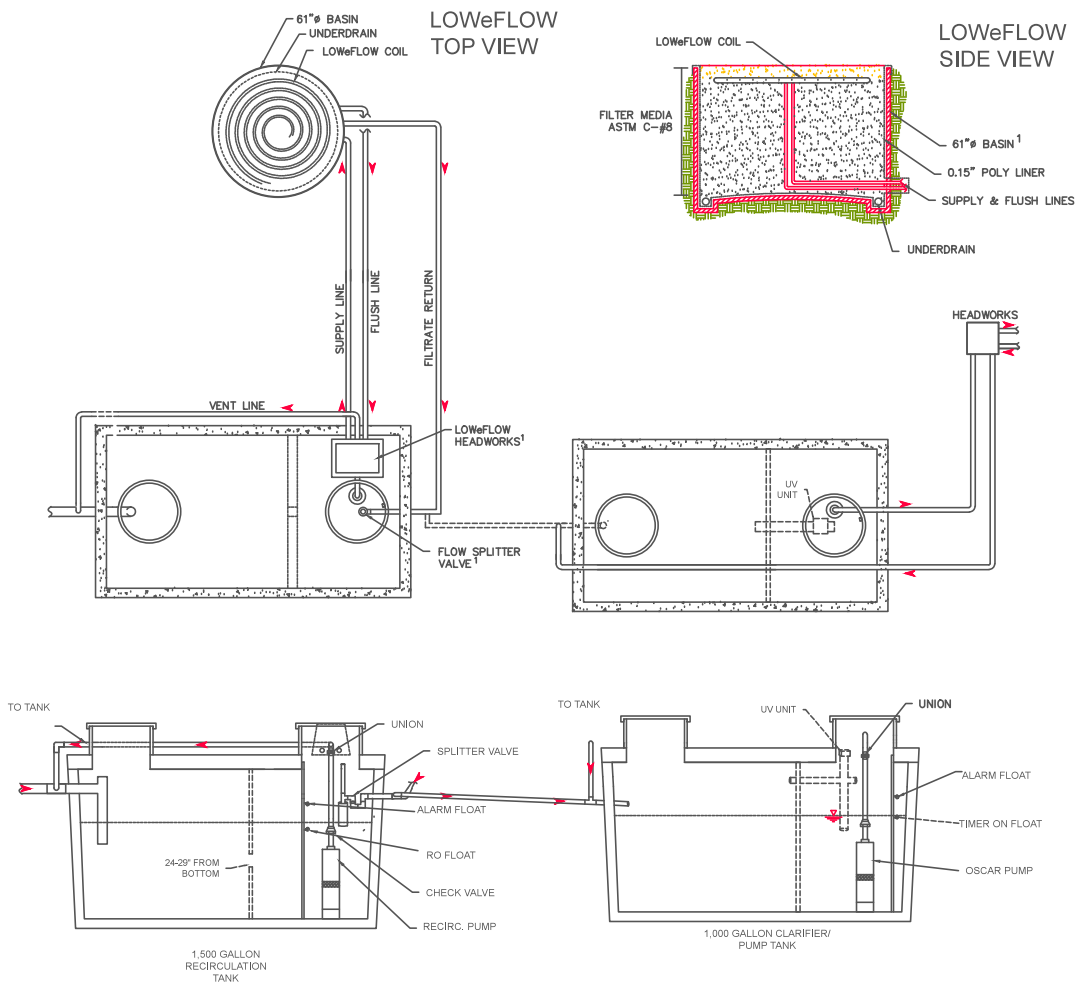


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### **System Description**

The *LOWeFLOW*™ treatment system is comprised of the *LOWeFLOW*™ recirculation filter, a septic tank, recirculation tank, headworks, and control equipment.

Wastewater is collected in a standard septic tank where gross solids are settled out and primary treatment occurs. Septic tank effluent flows from the septic tank into the recirculation tank. Liquid in the recirculation tank is mixed with treated filtrate from the *LOWeFLOW*™ filter. The mixed liquid is dosed to a drip tubing network called a *Coil* in the top of the *LOWeFLOW*™ filter. Treated filtrate from the *LOWeFLOW*™ filter flows back to the recirculation tank through the split flow tee. The position of the splitter valve determines the flow path of the filtrate. When the liquid level in the recirculation tank is high enough to seat the splitter valve, all of the filtrate passes through a clarifier prior to reaching the *Salcor 3G* UV light and into the

discharge tank, otherwise, all or a portion of the returning filtrate returns to the recirculation tank.

### **Design Criteria**

There are four segments to the *LOWeFLOW™* Treatment system design: filter sizing, number of *Coils*, tankage, and pump/control equipment, including *Salcor 3G* UV light. The standard residential *LOWeFLOW™* system (**LF-500**) is a 500 gpd kit with some field assembly required (for parts list see appendix E). For system design greater than 500 gpd design flows see appendix "B". For *Salcor 3G UV light* criteria see *Salcor* manual 2016.

#### **Filter sizing:**

A standard residential 500 gpd unit is sized based on 25 gpd/sq. ft. or 20 sq. ft. The media for the *LOWeFLOW™* filter shall be *Growstone LFGS-30* (see Appendix A). The depth of the media required between the tubing and underdrain is 30". There is an additional 3" of media covering the drip tube and 3" deep layer of media for the underdrain. The over-all height of the *LOWeFLOW™* Filter is 36".

#### **Drip Tubing Network Layout:**

The tubing used in the *LOWeFLOW™* Treatment System is exclusively Netafim Bioline™, 0.42 gph emitters. Each residential *LOWeFLOW™* system is equipped with four (4) 100 foot laterals configured in a pre-assembled *Coil*. The *LOWeFLOW™* system is intended to be operated at a 4:1 recirculation ratio. See appendix D for details on timer settings.

#### **Tankage:**

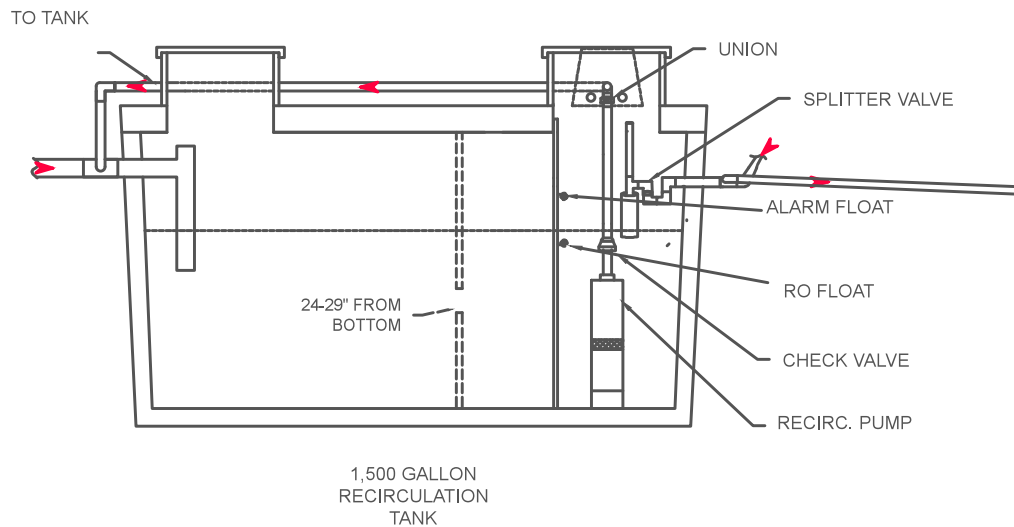
All tanks must be approved by WA DOH as wastewater containment vessels. Minimum liquid volumes for a 500 gpd design flow are:

- Settling (septic) tank **800 gallons**
- Recirculation tank **400 gallons**
- Clarifier **250 gallon**

There are two options for septic/recirculation tank arrangements:

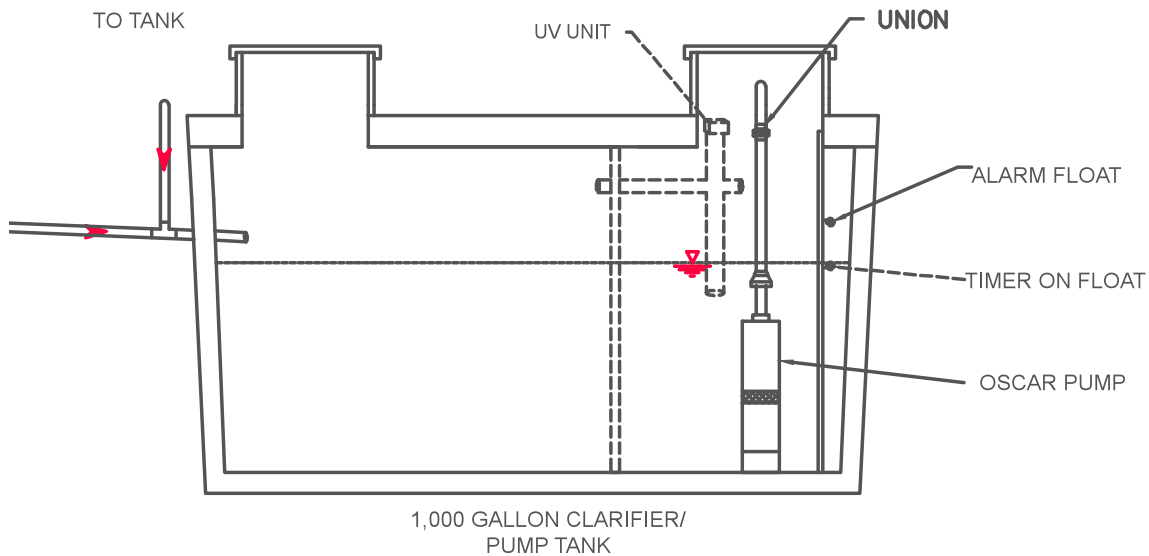
Option #1: One tank: a double compartment tank with a flow through port between compartments.

Option #2: Two tanks: a single compartment septic tank and a separate recirculation tank.



### **Option #1:** Single tank

A 1500 gal two-compartment tank with a 2/3 first compartment and 1/3 second compartment volume split and a 4" diameter flow through port 25-29" above the floor. The first compartment serves as the primary settling (septic) tank and the second compartment is the recirculation tank.



Clarifier: The *LOWeFLOW*<sup>™</sup> system must incorporate at least a 250 gallon clarifier for a 500 gpd design flow. Clarification must precede the UV light.

### **Pumps/Control Equipment**

The *LOWeFLOW*<sup>™</sup> Treatment system incorporates a recirculating pump which has two functions: dose the *LOWeFLOW*<sup>™</sup> filter and flush the *Coil* and disc filter.

Most system designs will need a discharge pump to dose the disposal component. The standard control panel used in all residential application is the **LOT-LF2P-RF-AUX-CW** control panels. The **LOT-LF2P-RF-AUX-CW** panel can accommodate the recirculation/flush pump, a discharge pump, a UV light, and the headworks valves. For UV light details see appendix. The **AUX** feature can operate a UV light or a small auxiliary pump. For instance, if there is a need to pump filtrate from the *LOWeFLOW* filter back to the recirc tank. The **CW** feature can facilitate the cold weather reverse flush headworks.

## Appendix A

### Media:

*Growstone LFGS-30*

## Appendix B: Design flow greater than 500 gpd.

### Design flow of 600 gpd:

#### Design parameters:

Tanks, minimum liquid volumes:

Settling tank	960 gallons
Recirc. Tank	480 gallons
Clarifier	300 gallons
Filter basin:	2-LFB-500 basins
<i>Coil</i>	2-LF-500 coil

### Design flows of 1,000 gpd:

Tanks, minimum liquid volumes:

Settling tank	200% of design flow
Recirc. Tank	80% of design flow
Clarifier	50% of design flow
Filter basin:	
Filter basin:	2-LFB-500 basins
<i>Coil</i>	2- LF-500 coil

For flows over 1,000 gpd additional *LOWeFLOW™ Coils* can be added in increments of 500 gpd. Call *Lowridge Onsite Technologies* for assistance.

## Appendix C: Parts list for standard residential, 500 gpd kit:

- *LOWeFLOW™* basin & *Coil*
- Headworks: disc filter, solenoid valves, pressure gauges
- Splitter valve
- Splitter tee
- Recirculation pump: 1/2 hp, 30 gpm turbine pump
- *LOT-LF2P-RF-AUX-CW* Control panel
- Floats for recirculation and discharge pump

- Child proof mesh
- Salcor 3G UV light (supplied by others)

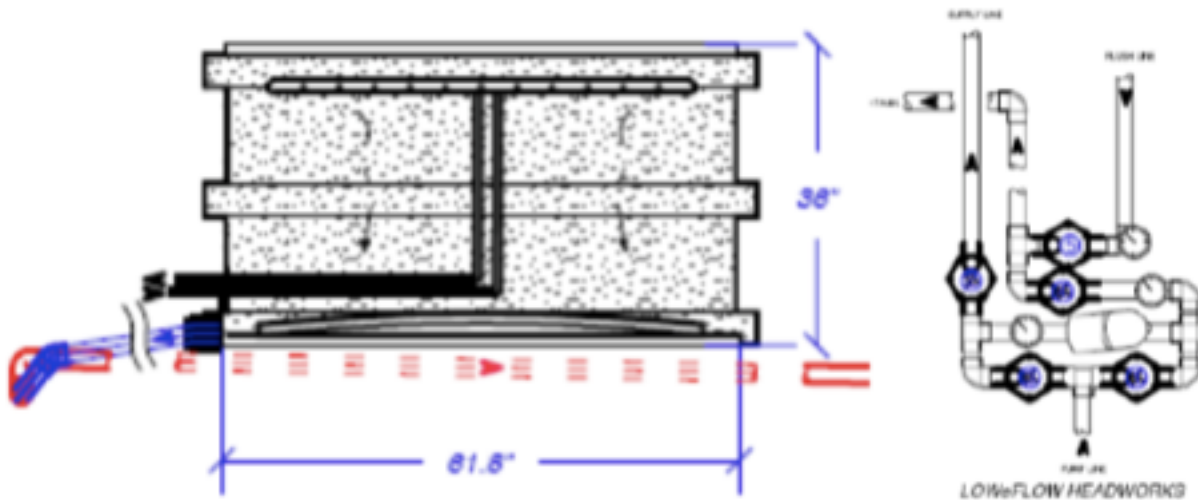
**Appendix D: Timer Settings for Recirculation Pump**

The goal is to achieve a recirculation ratio of 4:1 of the average daily flow. The table below gives the timer settings for a variety of average daily flows. Note that the "ON" time is always **30 seconds**. The standard 500 gpd *Coil* has an estimated flow rate of 5.5 gpm. Actual flow may vary.

<u>Ave. Flow</u>	<u>Recirc. Flow rate</u>	<u>"ON" Time</u>	<u>"OFF" Time</u>
100 gpd	400 gpd	30 seconds	9.5 min
150	600	"	6.0
200	800	"	4.5
250	1000	"	3.5
300	1200	"	3.0
350	1400	"	2.5
400	1600	"	2.0
500	2000	30 seconds	1.5 min

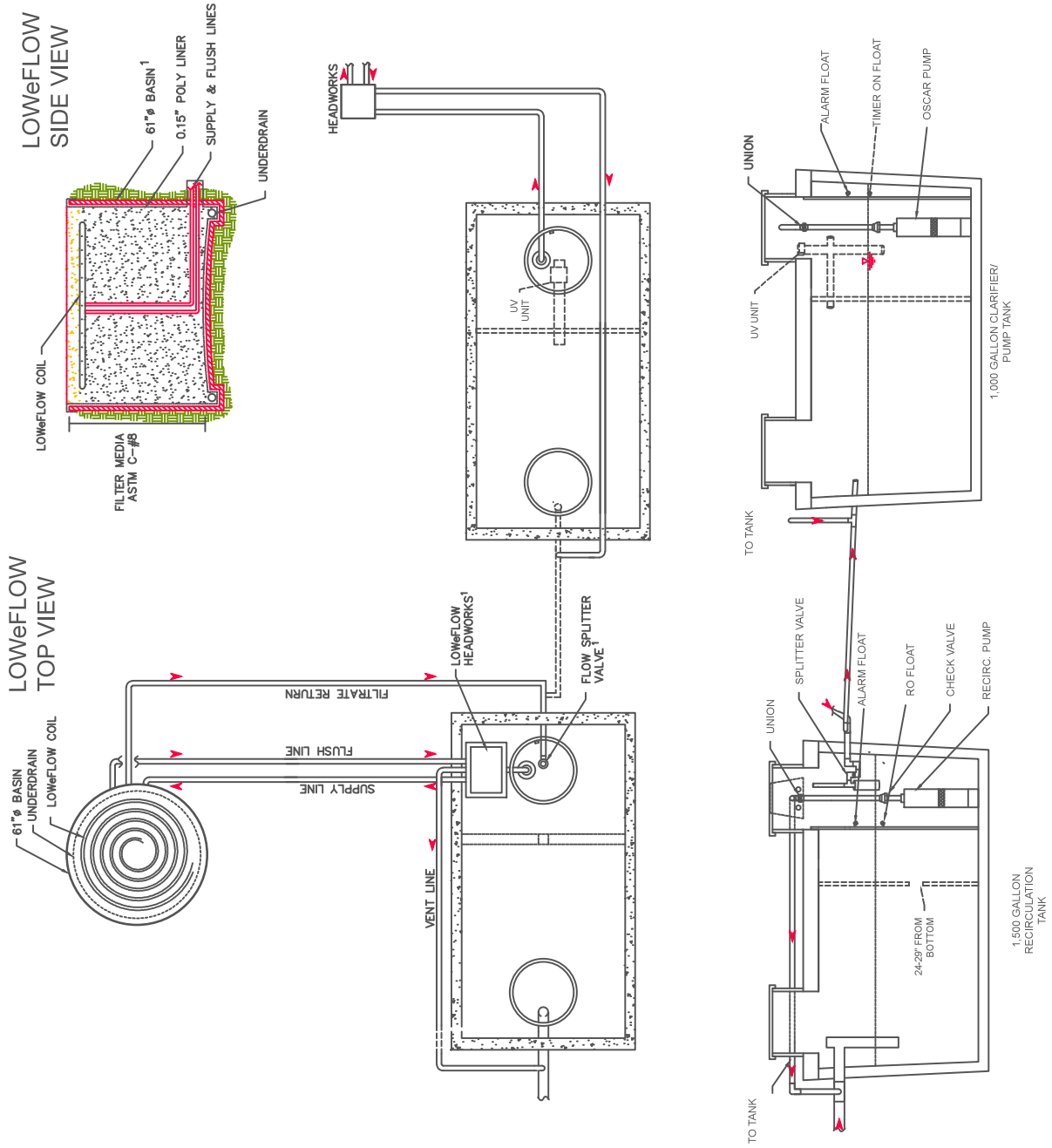
**Appendix E Drawings:**

**LOWeFLOW™ 500 gpd Coil and Headworks**





# LOWeFLOW™ 500 gpd One Tank Option



## Appendix F: Multiple UV Light Arrangements:

When designing multiple 500 gpd units, i.e., 1,000 gpd, 1500 gpd, an equivalent number of UV lights must be incorporated: one light for each *Coil*. The UV lights must be plumbed in parallel and the flow through each light must be equalized. To insure flow equalization, use the drawings below as a guide. Cap the outfall of the UV lights and drill one 5/16" orifice in the end cap for each UV light. A 5/16" orifice will limit the out flow to 0.5 gpm.

