

**May 31<sup>th</sup> 2010 ~ Monday Morning Minutes:**

**Sump and Sewage Pump Flow Rate & Minimum Run Time**  
by Norm Hall

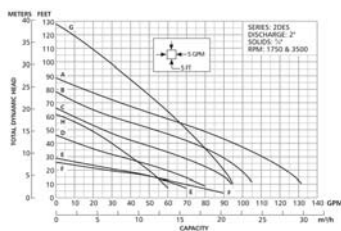
The last few articles focused on the sump diameter and float levels. The flow rate is also used in the sump sizing. Obviously, the pump flow rate must be greater than, or equal to, the maximum expected effluent flow into the sump. In addition, the sump storage from the lead pump on, float to the off float, must be large enough so we do not cycle the pumps too often.

Bell and Gossett recommends the pumps cycle no more than 6 times per hour. Based on the recommendation, the pump should run for 10 minutes.

If you take the gallons per minute (GPM) flow rate at design times 10, you will have the minimum required storage volume between the lead pump on and pump off floats. Here is a chart showing the average storage, per inch, in fiberglass basins.

Basin Diameter (Inches)	Gallons per Inch (approx.)
24"	2
30"	3
36"	4
42"	6
48"	7.5
60"	12
72"	17.5

Let's look at an example: Assume you are designing a storm water sump pump system and you have determined you need to pump 50 GPM against 20 feet of head. You select a B&G 2DES series effluent pump with a 1/2 HP motor, since you only expect 3/4" solids and want the advantage of dual seals, with moisture sensing, between the two seals. Your head selection is based on 3" pipe size, which is just above the minimum velocity of 2 FPS (see MMM of 4-26-10). You could have also chosen 2" pipe with a 4.5 FPS velocity.



- **Dual Mechanical Seals**
  - Lower: SILICON CARBIDE VS. SILICON CARBIDE sealing faces. Stainless steel metal parts, BUNA-N elastomers.
  - Upper: CARBON VS. CERAMIC sealing faces. Stainless steel metal parts, BUNA-N elastomers.
- **Seal Sensor Probe:** Located in oil-filled chamber. If pumpage should begin to leak past lower seal it indicates to pump control panel a fault has occurred. Requires optional Seal Fail Circuit in the control panel.
- **Shaft:** Corrosion resistant, stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.
- **Fasteners:** 300 series stainless steel.

You want pump guide rails, and based on the [MMM article from 5-17-10](#), you select the recommended 60" diameter sump for 3" pipe. Today's article advises you have 500 gallons of storage between pump on and off. Based on the chart above, you will require about 42" of storage level.

*Next week we will examine the float levels for the lag pump and alarm conditions.*

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The Perfect Pump for ANY Installation...

**SS Pump**  
3/8" solids handling  
1 1/2" discharge



**2 DES Effluent Pump**  
3/4" solids handling  
2" discharge



**4 DWS Sewage Pump**  
3" solids handling  
4" discharge



**Goulds Vortex Pump**  
4" solids handling  
4" discharge