

July 2011

BYPASS PUMPING SYSTEM - How to choose the right pumping system to securely meet your objectives in a cost effective manner.

Many bypasses are similar in appearance and name, but it's their subtle differences that require close attention to fully understand component performance parameters. To determine the right pump, we first need to understand many different aspects of the **physical conditions** of the application – **Flow, Lift/Pump Strength, and Distance.**



Flow - is the quantity of liquid being discharged over time calculated in gallons per minute or litres per second. Flow determines the line size of the piping or hose.

Lift - the total lift combines the suction and discharge lift. Lift determines the pump strength.

Distance - the length of the hose/pipe to discharge. Distance determines if the line size should be up-sized to reduce friction loss.

Flow - Different sewer line sizes have different flow capacities. Knowing the sewer line size will help address the maximum flow the sewer line can carry. Once the size of the line is known, the appropriate mechanical sewer plug can also be selected. Understanding the line size is a priority as it indicates the maximum flow the bypass may have to cover. Velocity of the flow in the sewer line coupled with the line size will give the maximum flow to be covered. Very often detailed flow data is available from the owner of the sewer. Now with the knowledge of the maximum potential flows to be covered, we can begin to size the temporary bypass line and pumping system. Approximate rules of thumb are; 4" discharge 500 gal/min: 6" discharge 1000 gal/min: 8" discharge 2000 gal/min: 12" discharge 4000 gal/min.



Lift/Pump Strength - Lift is a critical element in the assessment of a pumping system. Suction Lift and Discharge Lift combined form the total gravity lift that a pumping system has to overcome. One other consideration is if the discharge is into a closed system which is under pressure. Additional pumping strength is required to enter a pressurized system. Pumps are grouped by design and within these design groups (electric submersibles, hydraulic submersibles, diesel or electrically driven self-priming centrifugal pumps) they are all broken into performance criteria such as high volume, high head, medium head and solids handling capabilities.



Distance - Friction occurs in all pipes and hoses when liquid travels through them. Distance is a critical design component in determining friction loss while the fluid is being pumped through the bypass to the receiving discharge point. Increasing the line size will reduce the friction. As a rule of thumb to reduce friction loss, use the same size hose or pipe as that of the pump discharge when the distance is less than 1000 feet, and use the next larger size hose or pipe as that of the pump discharge when distance is more than 1000'.



Choosing the right bypass pumping system can be extremely complex. You can be assured that with our assistance, you will be able to select the right pump for your project. Having the right pumping system sized by an experienced Applications Engineer minimizes risks and ensures a successful bypass. At Aquatech, we can provide professional turn-key bypass pumping services and/or equipment supply. We specialize in portable pumps and pumping equipment for all of your pumping needs such as sewage bypass, creek bypass, industrial fluid transfer and surface water pumping. For more information on bypass pumping, please contact one of our representatives.

PERFORMANCE CURVE

A complete system curve should be done for every application to confirm all characteristics of the pumping system and any changed conditions should be analysed to assess the impacts of the changed condition to the system.

Beware of selecting pumps and pumping capacities off of published pump curves or capabilities. Make no mistake – these are a marketing tool for pump manufacturers and are based on little to no parameters to make that particular pump look attractive to a wide range of needs.

Operating in the "sweet spot" of the curve

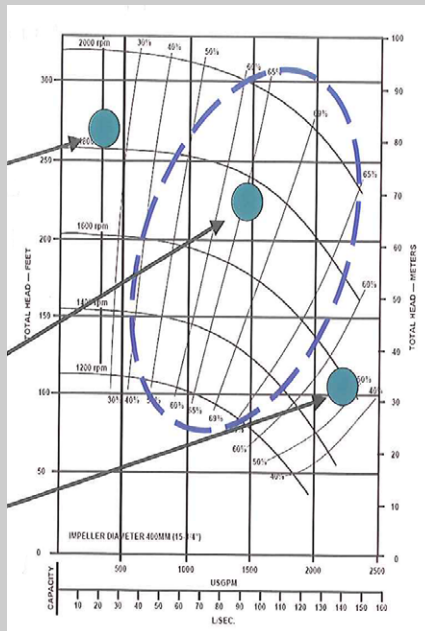
For long term operation, operating to the



“left” of the curve will create discharge cavitation and possible shaft stress and seal failure.

For best long term results, always engineer the pump system to operate in the “sweet spot” of the performance curve. Adjust pipe size to reduce friction loss whenever possible.

Operating to the “right” of the curve may cause suction cavitation and impeller and wear plate pitting.



The main thing to remember is that the most cost effective bypass pumping system is the right one that securely meets your objective.

Aquatech Now Also Providing Services In Nunavut and Eastern Canada



Aquatech is the exclusive distributor of Godwin Pumps in Ontario, Nunavut, Newfoundland and Eastern Labrador

Email Us: info@aquatd.com

Visit Us: AquatechDewatering.com

Concord Office
 69 Connie Crescent
 Concord, Ontario
 L4K 1L3
 Phone: (905) 907-1700
 Fax: (905) 907-1701

Ottawa Office
 2510 Delzotto Avenue
 Ottawa, Ontario
 K1T 3V7
 Phone: (613) 822-9990
 Fax: (613) 822-9901

Sudbury Office
 2505 Lasalle Blvd.
 Sudbury, Ontario
 P3A 4R7
 Phone: (705) 525-1700
 Fax: (705) 525-1709

Newfoundland Office
 P.O. Box 635
 Carbonear, NL
 A1Y 1C1
 Phone: (709) 589-5003
 Fax: (709) 383-0116