Watering your Lawn and How to Select a Lake Pump

Pumping from a lake, pond or stream is a very environmentally supportive thing to do. Lakes and streams are an excellent source of water for residential and agricultural irrigation projects.

By pumping from a lake, you eliminate the need for a costly well and the iron or other suspended minerals that water may contain when pulled from a well adjacent to a lake.

You eliminate the costly watering expense and dispersion of harmful chlorine onto your plants and into the adjacent lake, pond or stream. To carry that a step further; lake, pond and stream water contain decayed animal and vegetative matter. When these elements are sprayed onto your turf grass or garden, they act as a natural fertilizer. Any run-off back into the lake, pond or river is water that actually came from that source, so is not intrusive.

The decayed vegetative and animal matter inherent in natural pond, river or lake water greatly reduces the need to apply store-bought fertilizers to your lawn, which run-off into your lake, pond or stream, causing algae bloom and harming the environment of the lake itself. So, pumping from a lake, pond or river is an excellent decision from an environmental standpoint and the impact on lake levels are so inconsequential as to hardly be worth mentioning here. A lake or pond is a reflection of the surrounding water table, so if you were to drill a well nearby, you would be pumping from the very same water table.

When choosing a pump for your lake project, there are four types of pumps to consider; centrifugal or "sprinkler pump", a jet pump, a multi-stage jet pump, and a submersible type pump.

Before choosing type, you must find out what your "lift" is. Your lift is the distance from the surface of the water body you intend to pump from, in a direct line straight up, to a point level with the highest head or point you intend to use the water in your system.

To define that a little better; that means if you stand someone at the edge of the lake and have them hold a PVC pipe straight up (one end touching the water surface) into the air, while you go up to the highest head in the system and site along a level to that pipe. The point on that pipe at which you site with your level would be your "lift" point, and nothing else matters. It doesn't matter where you place the pump, although the closer to the water the better, because a pump is more effective and efficient when pushing water rather than pulling it. But your essential lift never changes, unless the water table in the lake drops or you install a higher sprinkler head in the system. Your "lift" is all that really matters.
Lift is very important, because it will probably dictate the type of pump you require. A centrifugal type pump, and that includes jet pumps, are capable of producing water up to a 25 foot lift, nothing beyond. The curve of water production and pressure falls off dramatically after 20-21 foot lift. For this reason you should consider a 21-22 foot lift (from water source level to highest head level) to be the absolute maximum lift appropriate for a centrifugal or regular jet type pump, and that's assuming that your water source will not see any drop in level during times of drought and that your system gallonage is figured the small amount of water produced at the higher lifts. In other words, if you have a 21 foot lift, but your pond drops 4 or 5 foot in level during the dry season, forget using a centrifugal or jet pump.

Assuming you are qualified for a centrifugal or jet pump, a jet pump is usually the better choice. Years ago almost all irrigation heads were of the "impact" type and required very little pressure to operate acceptably. Thus the centrifugal pumps which developed low pressure were acceptable and became known as "sprinkler pumps". Today's gear driven rotor sprinkler heads like a little more pressure to operate correctly, break up the spray effectively, and cover correctly. For this reason, we recommend use of a jet pump, which installs just as quickly and easily as a "sprinkler pump", using the same "one suction pipe, one discharge pipe" piping system, but produces slightly less volume of water at better pressure. Jet pumps are available up to 1.5 horsepower, but once you go beyond the 2 horsepower level, you get into pumps such as the BLMS 3 and 5 horsepower series, where a "high head" model is available to produce excellent pressure and great volume. Any "high head" centrifugal pump produces better pressure than a "medium head", and so is more appropriate for irrigation purposes.

Rule of thumb on pump horsepower is one horsepower per acre, with exceptions. For instance, homeowners should go with a minimum one horsepower, because it provides a reserve of pumping ability and a one hp pump costs very little more than a half or three-quarter horsepower model. For this same reason, a 1.5 horsepower pump is our most popular seller and considered the "norm" for residential applications up to one and one-half irrigated acre, depending upon lift. Lift is also a factor, in that a pump with a 7 foot lift will produce almost twice as much water at the same pressure, as a pump with a 21 foot lift. So, although "the higher the lift, the bigger the horsepower" is true to an extent, it has its limits. A five horsepower centrifugal type pump will barely dribble water at a 30 foot lift.

Your pump really should be selected before designing your irrigation system. Once you determine your pump size, you can determine water availability for watering stations, designing smaller watering stations in areas with higher lifts (perhaps up by your road), larger watering station down where the lift is much less (perhaps down by the lake, pond or river). A typical system with a 1 horse jet pump and an 18 foot maximum lift might have stations with 20 gallons per minute down near the lake, but with 10 gallons per minute up where the lift was greatest.

For a medium lift situation of between 21 and 36 feet, you can use either a submersible
pump in the lake or a multi-stage jet pump such as the HMSF model. Assuming you can place the pump somewhere near the 15-20 foot level of lift (fairly close to water source), the HMSF pump will provide approximately 15 gallons of water per minute at 45-50 lbs psi, which is considerably better than is usually provided by a city water meter.

A submersible pump can be used in any medium or high lift situations. They are a little more difficult to install because the pump itself goes underwater, but provides much higher pressure, can't ever lose its prime, and doesn't have the 25 foot lift wall that we see with centrifugal and jet pumps. The rule of thumb when choosing a submersible for your project is the traditional 1 horsepower per acre. Once you understand how, it is perfectly feasible and not much harder or more complicated to install a submersible pump on a lake pump project than it is to install a centrifugal pump (we have available a kit for that purpose). You also see a lot less maintenance and prime problems than are present in situations where a centrifugal pump is installed in a borderline lift situation, where a submersible pump would be much more appropriate and produce more water per horsepower at much higher pressure.

A word of caution though; a submersible pump is going to require 220 volts be brought underwater to the pump and will create an electrical hazard to some extent. We have installed hundreds in Florida over the past 25 years without incident, but have heard of two incidents during recent years in western states. For that reason we would recommend the electrical line bringing power to the lake pump be placed inside grey electrical conduit, taped to the main pressure line every few feet, and the system be operated using a GFI circuit installed specifically to power the pump. Check to see if your local or state laws regulate placement of a sub pump in a lake.

When pumping from a lake, river or stream, it is difficult to successfully adjust a pressure switch, because water levels vary seasonally on these types of water sources, therefore in our opinion, you are always better off going with a less expensive and more failsafe pump-start relay set-up (only sends power to pump when sprinklers actually operate) rather than a more expensive tank-pressure switch set-up. A tank is also obtrusive, doesn't look good sitting near the edge of a lake and is a beacon for water-borne thieves and vandals. A pump is much less noticeable and can be hidden using a dummy dog house that will definitely discourage amphibious visitors. Just paint a black door on the side facing the lake, with "Killer" labeled above the door and a short length of huge chain.