

Appendix 9: Planning an Open Diversion Canal

There are many factors in planning a diversion canal and it is not the intention of this appendix to delve into great detail. Instead, we are presenting a brief overview of the important elements and considerations in planning the route and components of your diversion canal.

Important factors:

- Flowing water in the river will always carry silt and sand particles, which can be very abrasive to the turbine. Although it is impossible to eliminate these particles entirely, including a silt settling basin in your design will help to greatly reduce the amount of these particles reaching your turbine. This will significantly increase the life of your turbine runner.
- It is important to remember that while a hydro installation is designed to handle constant flow, rivers are variable in their flow rates throughout the year. Therefore it is important to create a diversion weir or dam to maintain channel flow at low water. The intake structure should be high enough to prevent excess water from entering your channel, and a spillway should be in place to allow excess water in the channel to escape.
- The channel should always be planned with flooding in mind. Floodwaters can cause a lot of damage to a poorly planned diversion channel. It is worthwhile to research past flooding records before beginning construction.
- Another factor demanding attention is the potentially destructive effect of turbulence in the flow of water through the channel. This can be erosive and lead to silt buildup. It also allows particles to remain suspended in the water.
- Remember that since the power delivered by the turbine is strongly influenced by the head of water at the entry to the turbine, the channel should not drop any more than necessary along its length. The more level the channel is, the slower the water also moves through it allowing silt particles to drop out and reducing turbulence. The ideal water speed at the turbine is less than ½ foot per second.

