



**Irrigation water suitability and
general guidance on different water
parameters**

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What I will cover

- **Water sources**
- **Water uses**
- **Physical contaminants and weeds/algae**
- **Biological contaminants**
- **Mineral contaminants**



WATER SOURCES

- **Rivers, streams**
- Boreholes
- Wells
- Lakes, reservoirs
- Seepage pits
- Process water
- Mains



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WATER USES

- **Spray irrigation**
- Drip irrigation
- Spray lines
- Sand beds
- Capillary matting
- Crop washing



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PHYSICAL CONTAMINANTS AND WEEDS/ALGAE



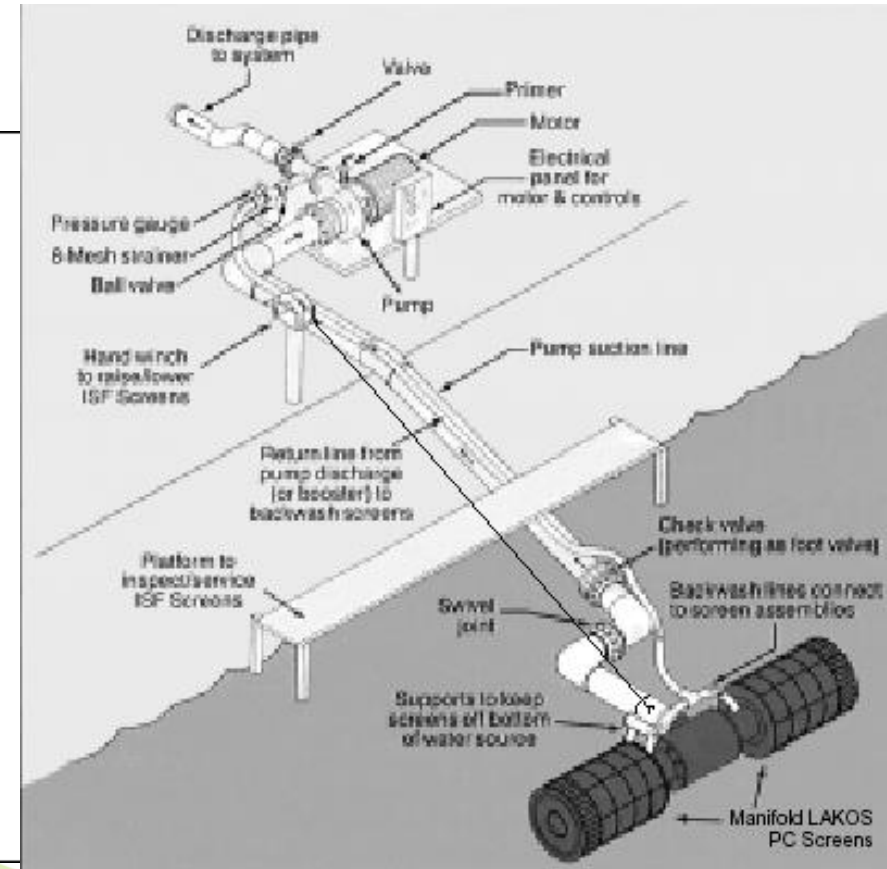
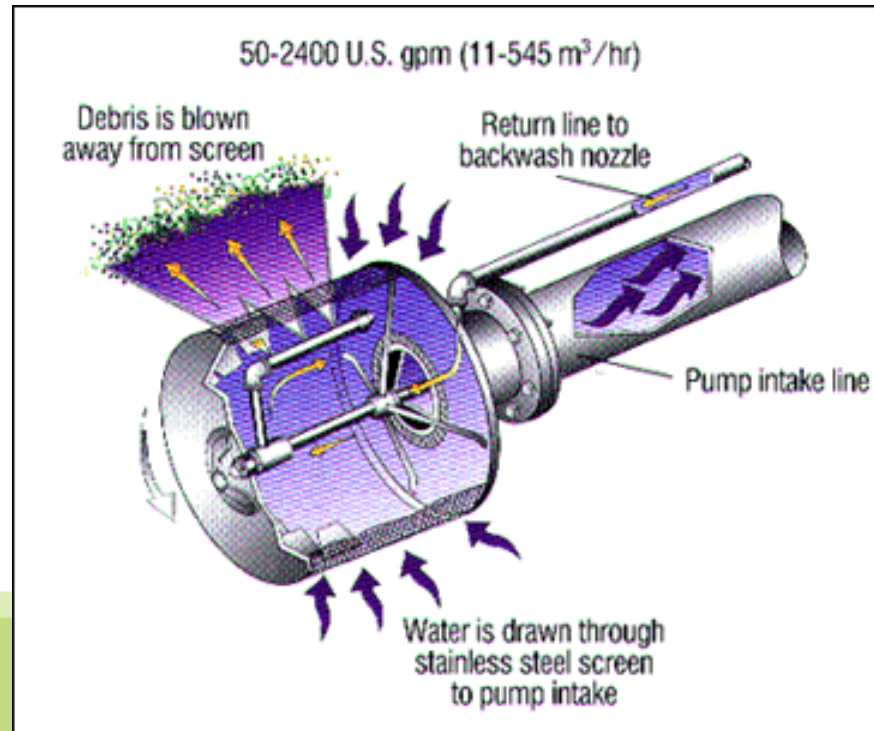
- Suction filters
- Sand separators
- Pressurised sand filters
- Screen filters
- Disc filters

Check list:

- ✓ Daily and hourly flow rate of water through the system
- ✓ Type of contaminant
- ✓ Degree of contaminant
- ✓ Size of contaminant particles
- ✓ Irrigation equipment type
- ✓ Electricity available?
- ✓ High capital cost vs low running costs?
- ✓ Low capital costs vs high running costs?
- ✓ Permanent or temporary installation?
- ✓ Construction space available....

PHYSICAL CONTAMINANTS AND WEEDS/ALGAE

- Suction filters
 - **Most important**
 - **Has limitations**
 - **Maintenance**
 - **Low cost**



PHYSICAL CONTAMINANTS AND WEEDS/ALGAE

- Pressurised sand/media filters
 - **Mostly with borehole water**
 - **Backflushing**
 - **Maintenance**
 - **Medium cost**
 - **High volume**



PHYSICAL CONTAMINANTS AND WEEDS/ALGAE

➤ Screens

- **Low cost**
- **Limitation on particle size**
- **Low cost**
- **Medium term**

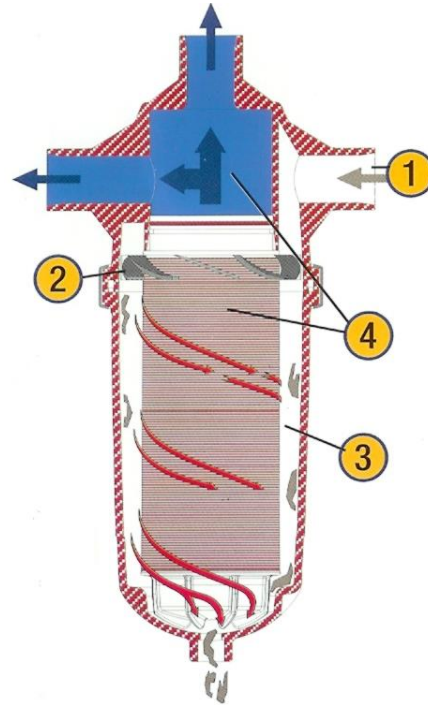


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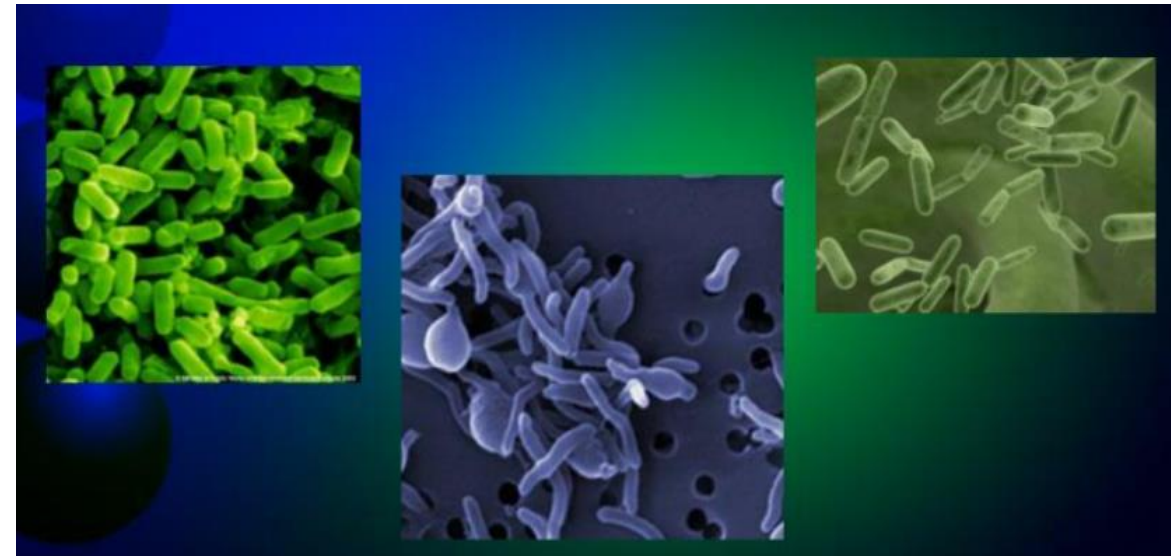
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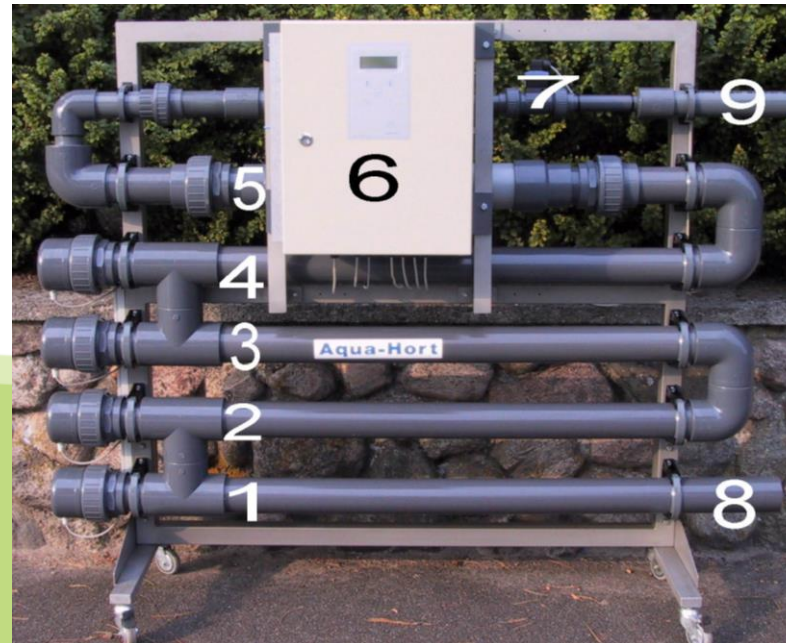
BIOLOGICAL CONTAMINANTS

- Develop from microorganisms and their activities
 - **Bacteria (Pseudomonas/Xanthomonas etc)**
 - **Fungi (Pythium/Phytophthora etc)**
 - **Viruses (ToBFRV, TSWV etc)**
 - **Protozoa (Euglena spp)**
 - **Parasites (Nematodes etc)**
 - **Some are human health hazard**



BIOLOGICAL CONTAMINANTS

- UV light
- Chlorine (hypochlorite)
- Chlorine dioxide
- Acetic acid
- Copper ionisation
- Slow sand filter
- Reed beds



MINERAL CONTAMINANTS

- Aeration
- Reverse osmosis (RO)
- Others



IRRIGATION WATER PARAMETERS




	Irrigation water
pH	5.4 – 7.0
Conductivity	20 – 500 uS/cm
Total dissolved salts less than	1,000mg/l
Bicarbonates	less than 100 mg/l
Alkalinity (carb + bicarb)	less than 100mg/l
Hardness (Ca+ Mg)	150 mg/l
Sodium	less than 50 mg/l
Chloride	less than 70 mg/l
Nitrogen	100 mg/l to 150 mg/l
NO3 – N	10 mg/l
NH4 – N	2 to 10 mg/l
Phosphorus	less than 1 mg/l
Potassium	less than 10 mg/l
Calcium	less than 60 mg/l
Magnesium	less than 6 mg/l to 24 mg/l
Sulphur	less than 24 mg/l
Iron	0.2 to 4 mg/l
Manganese	less than 0.5 mg/l to 2 mg/l
Zinc	less than 0.3 mg/l
Copper	less than 0.2 mg/l
Boron	less than 0.5 mg/l
Molybdenum	less than 0.1 mg/l
Aluminium	0.05 mg/l to 0.5 mg/l
Fluorine	less than 1 mg/l

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