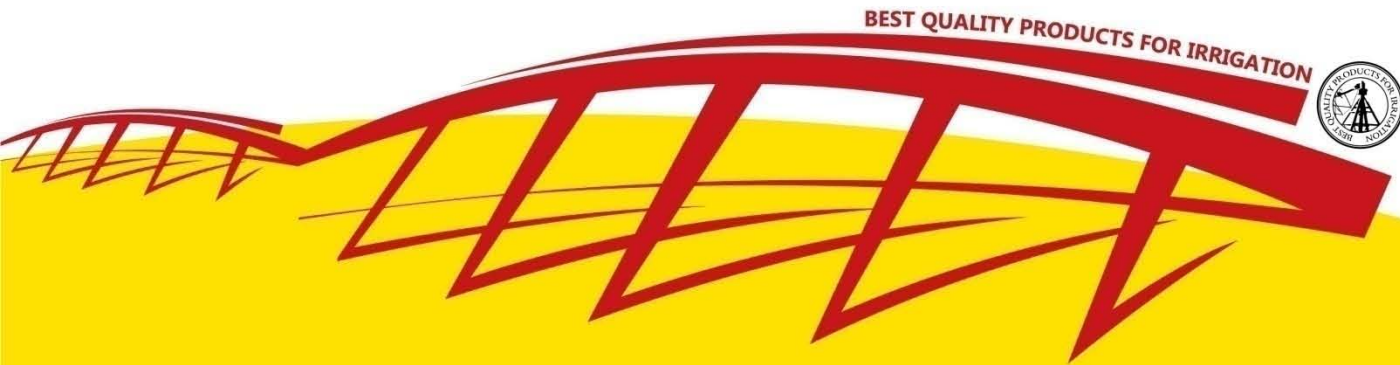




Proposal for Al Rawabi pump project

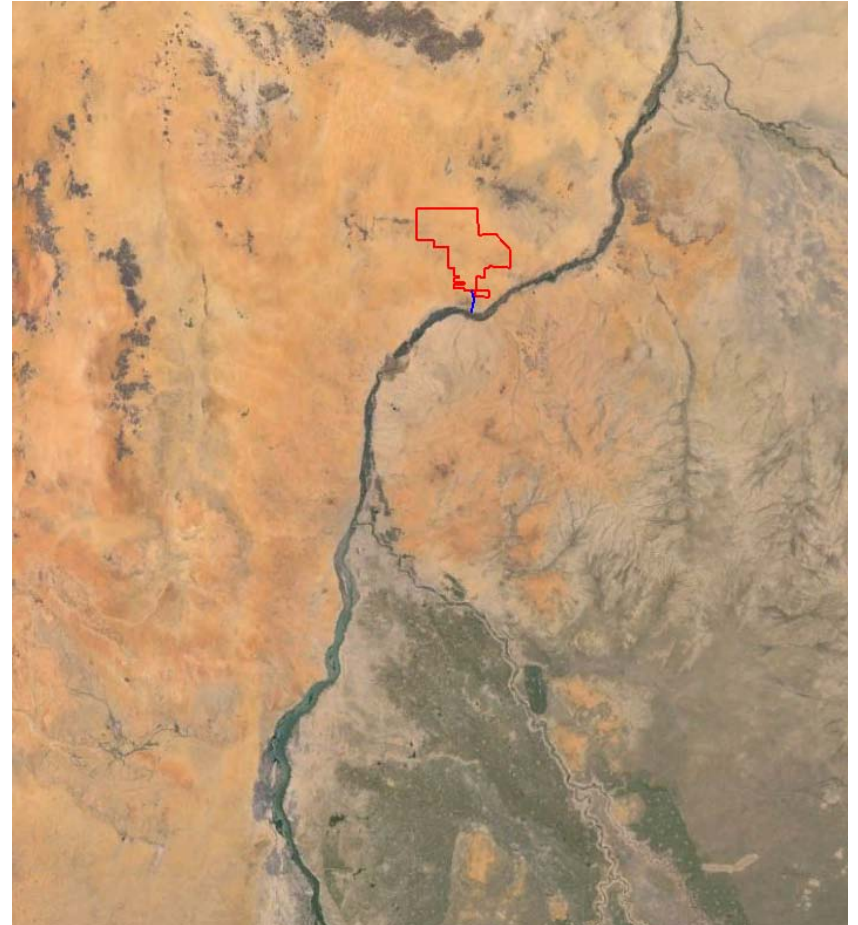


1.About Nile River

White Nile originates from Lake Victoria in East African highlands, the water is dark green and contains lots of organic matter.

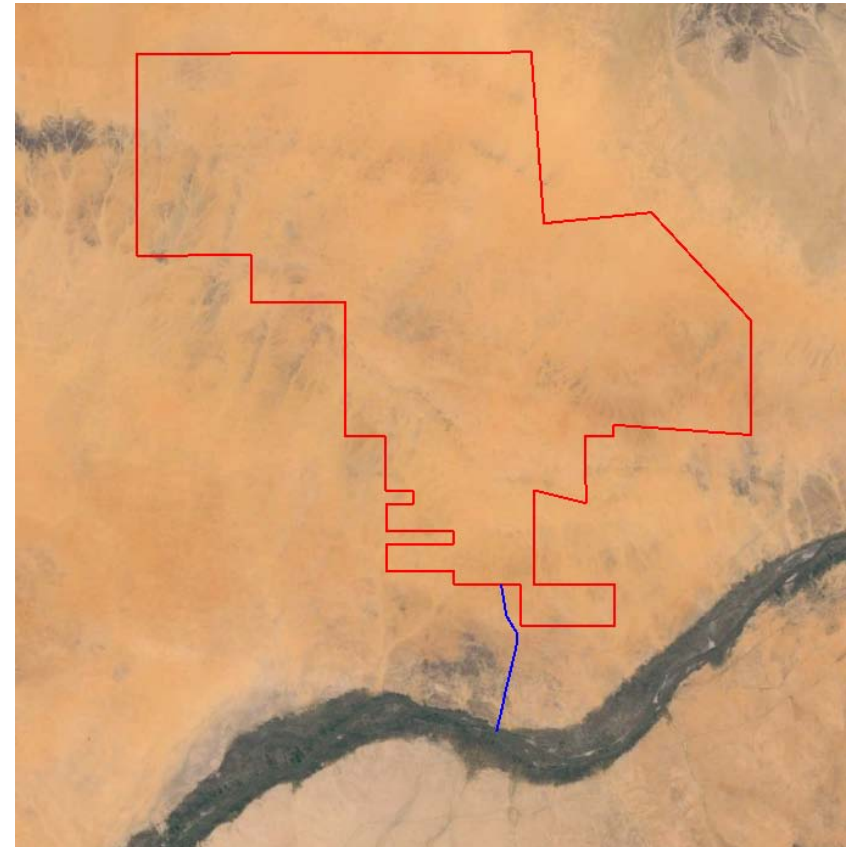
While that of Blue Nile derives from Ethiopian highlands is bronzing and contains plenty of sediment and minerals.

Two rivers flow northward after interaction in the Sudanese capital Khartoum and then called the Lord of the Nile.



1.About Nile River

Project Al Rawabi locates 150km north far away from Khartoum and 11km straight distance from the Lord of the Nile, which contains a variety of minerals, sediment, organic matter and other substances.



1.About Nile River

Analysis of water

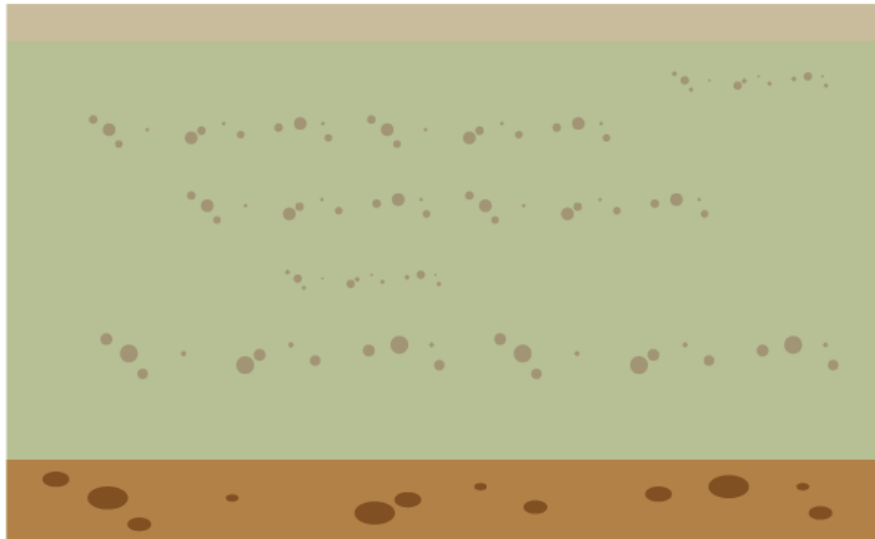


Item	Content	Unit
Chroma	>15	°
Lookable	0	
Turbidity	3750	°
Smell	Feeble	
pH	7.69	
Fe	0.64	mg/L
Mn	0.05	mg/L
Cu	0.01	mg/L
Zn	0.01	mg/L
An	0.001	mg/L
Se	0.001	mg/L
Hg	0.0005	mg/L
Cd	0.001	mg/L

Data source: Nile water analysis report from Khartoum Geely station (operated by Germany and built by China)

1.About Nile River

Analysis of water



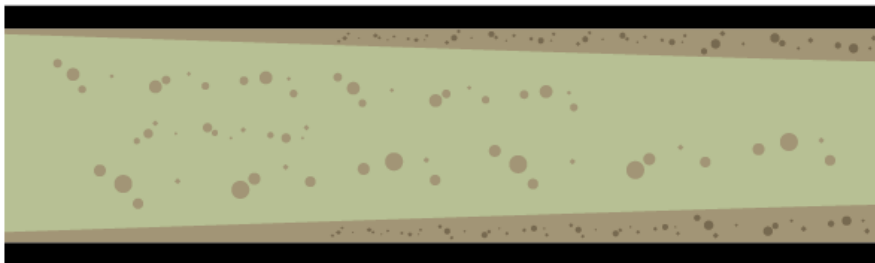
Plankton / Insect egg
Stickiness / Grass seed



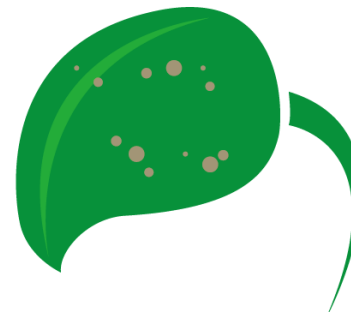
Stickiness / Plankton
Mineral substance
Organic matter



Sand grain



Stickiness and insect egg block the pipe and reduce the life of part facilities.

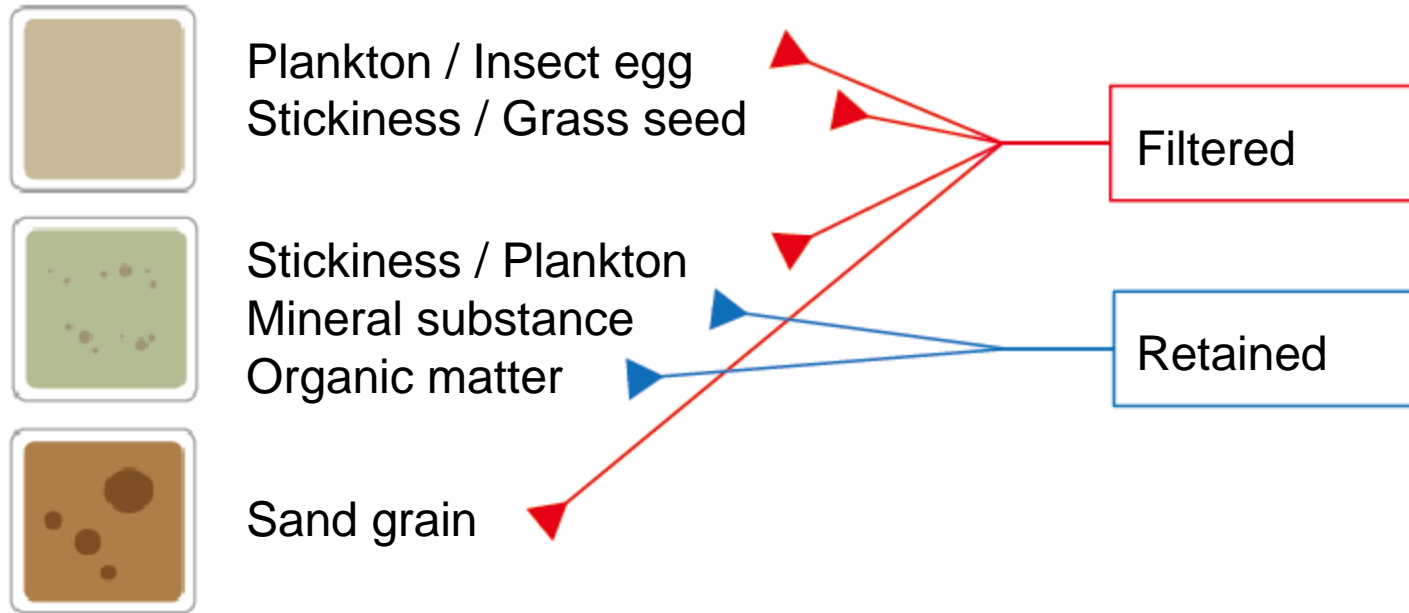


Stickiness prevents crop from breath.



Grass strives for nutrients with alfalfa.

2.About Filter system



Filter is indispensable for reducing the destructiveness to water facilities. While the water in Africa is slightly polluted and contains plenty of organic and mineral composition, which is beneficial to alfalfa's yield.

The report below will discuss how to filter sediment and extract the nutrient-rich irrigation water.

2.About Filter system

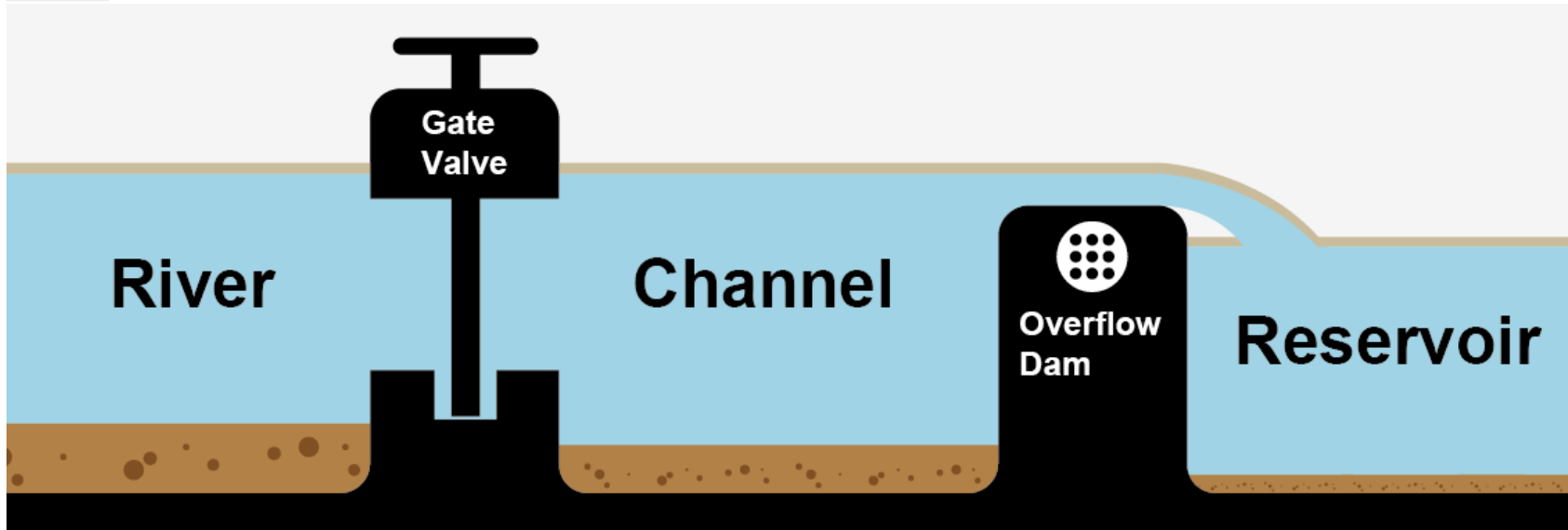


1. Bottom water filter system

2.About Filter system



Sand grain filter system



Step.1

Water with sediment drains into the precipitation canal through regulating the valve.

Step.2

Drained water slows down and large sediment precipitates.

Step.3

Overflow dam blocks the big sediment and gets water from the top. And then second precipitation works.

2.About Filter system



Sand grain filter system



Yellow river

2.About Filter system



Main channel

2.About Filter system



Sand grain filter system



Main Channel

2.About Filter system



Sand grain filter system



Main Channel



Main Channel and valve gate

2.About Filter system



Running after 1 year

2.About Filter system



Sand grain filter system



Simply designed wall inside the overflow channel can block lots of sediment outside.

2.About Filter system



Walking channel for dredging equipment beside the ditch. Dredge regularly once a year.



2.About Filter system

Overflow dam

2.About Filter system



Spillway between the main canal and grit chamber, which can block sediment flowing into the reservoir.

2.About Filter system



Spillway between the main canal and grit chamber, which can block sediment flowing into the reservoir.

2.About Filter system



Main canal



Spillway



Dredging channel
besides grit chamber

2.About Filter system



Grit chamber

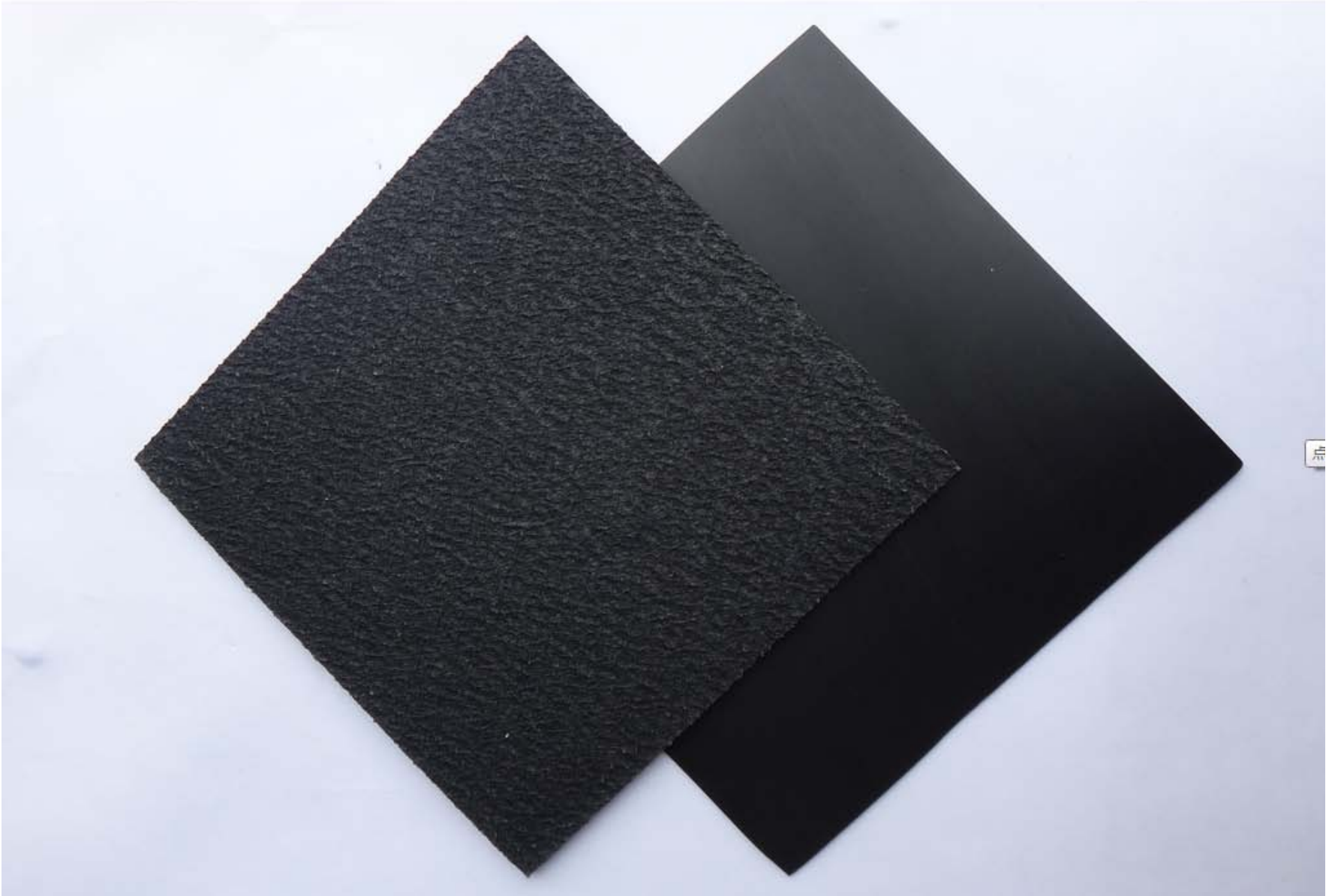




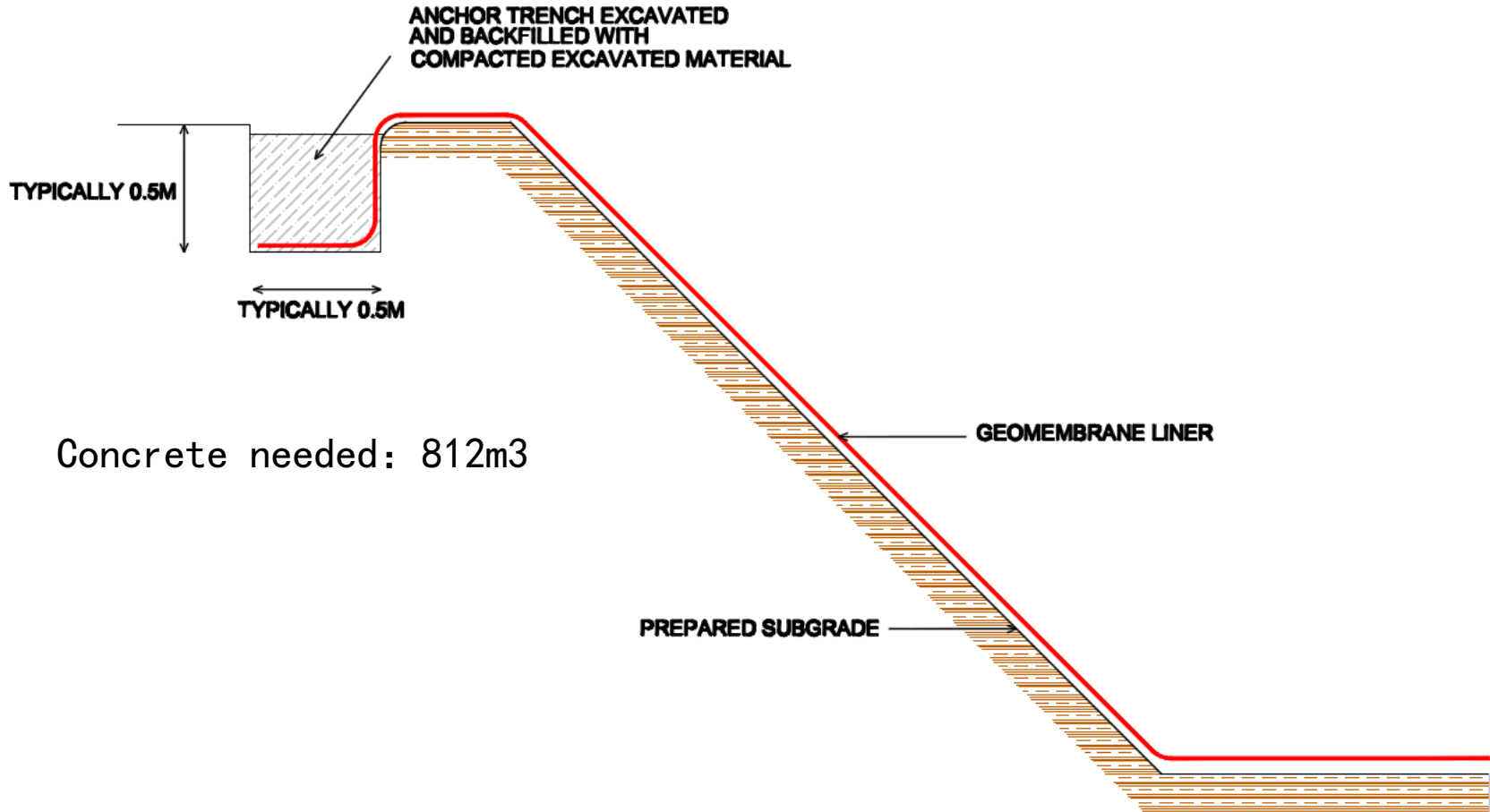


HDPE geo-membrane

HDPE geo-membrane is used in the bottom of the dam to protect water leak and protect the side of the dam



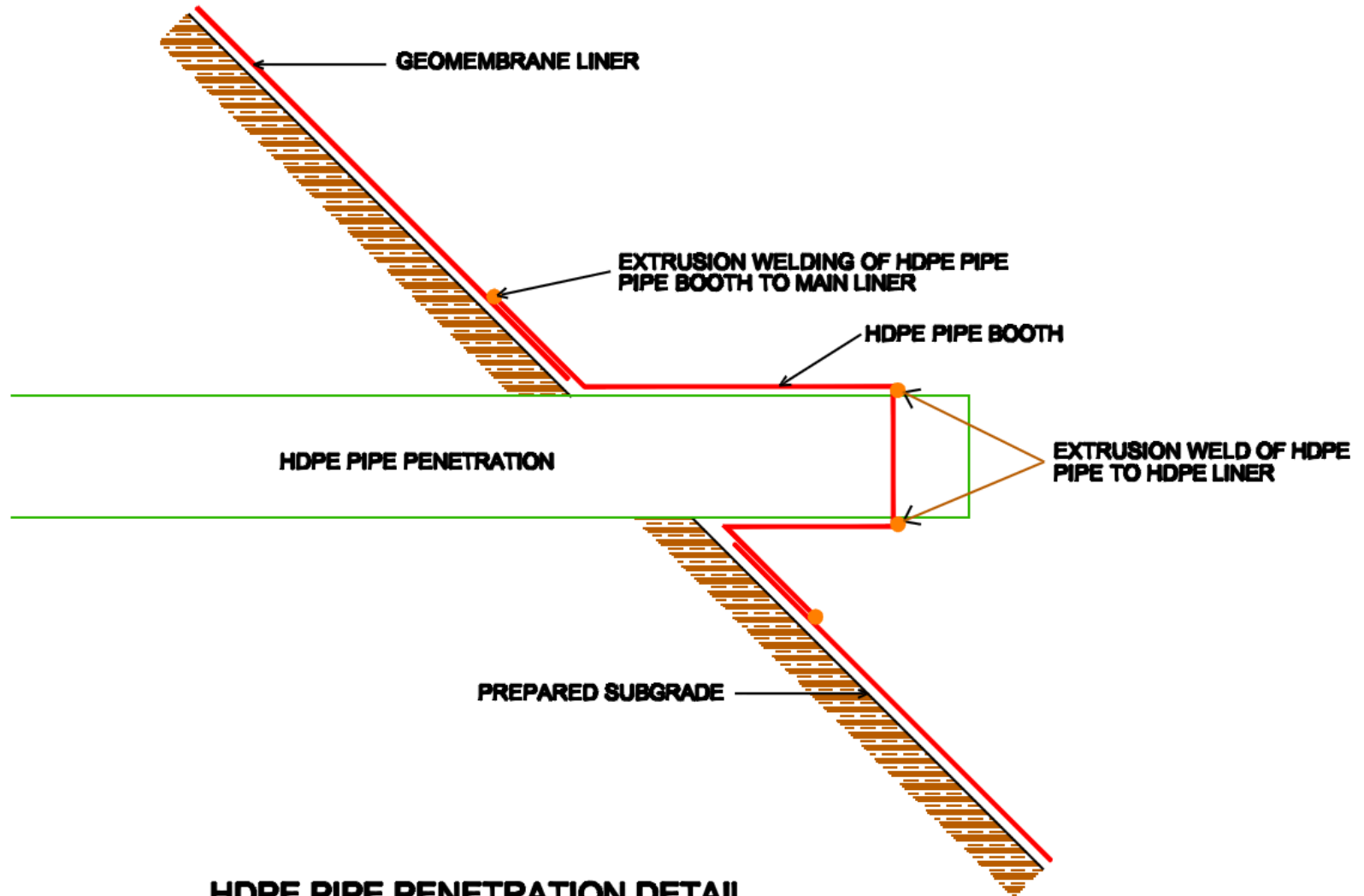
4.2 Geo-membrane liner assembling (5)



Concrete needed: 812m³

TYPICAL ANCHOR TRENCH DETAIL

4.2 Geo-membrane in pipe inlet (6)



HDPE PIPE PENETRATION DETAIL

2.About Filter system

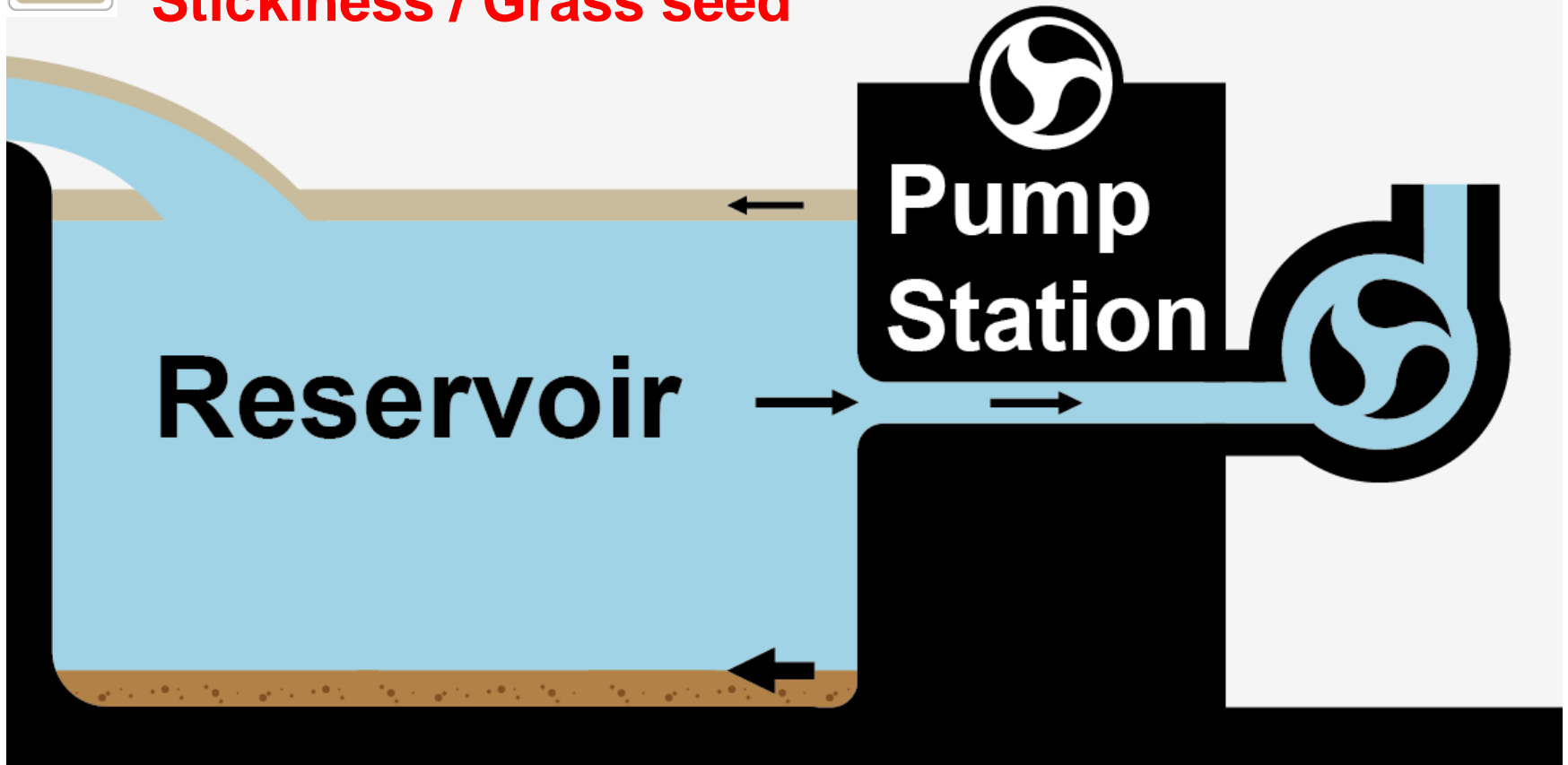
2. Top water filter system

2.About Filter system



Plankton / Insect egg

Stickiness / Grass seed

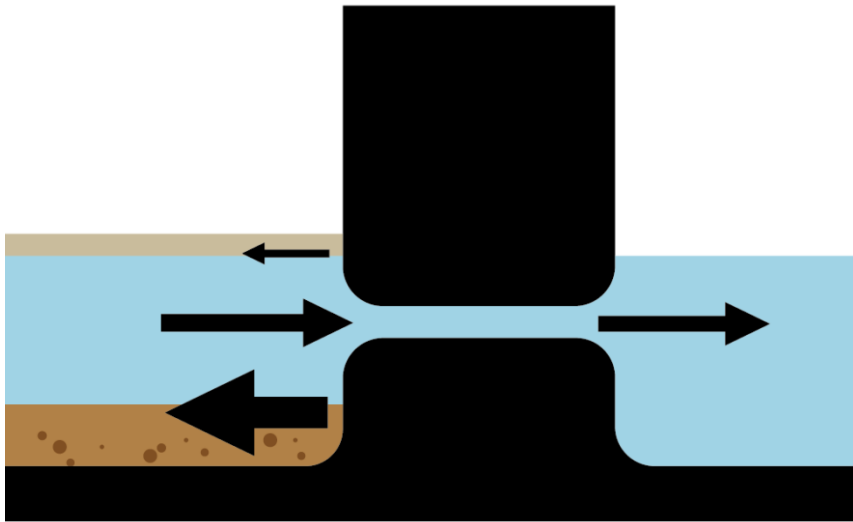


To avoid grass and insect egg flowing through, need get water from the middle.

2.About Filter system



How to get water from the middle?



Solution 1.

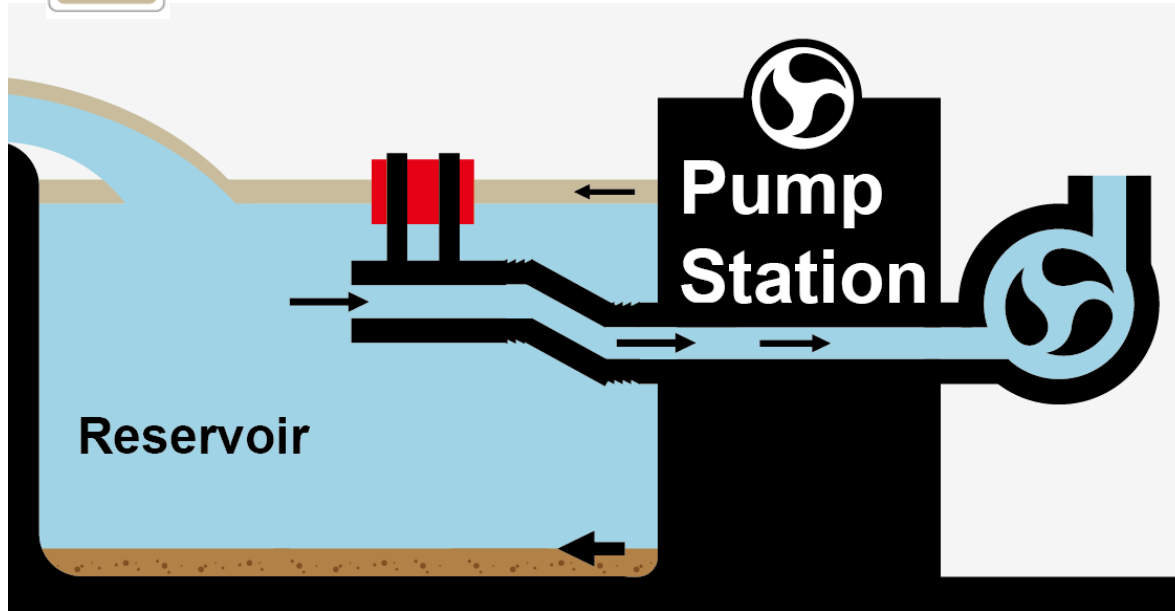
Set a valve with gap in the middle, then the flottage and sediment are prevented outside.



2.About Filter system



How to get water from the middle?



Solution 2.

Set a turning joint on the watergetting pipe and connect it with a float bowl. This is very flexible and especially suit to the water fluctuation during flood and drought.

2.About Filter system



How to get water from the middle?

Solution 2.

Set a turning joint on the watergetting pipe and connect it with a float bowl. This is very flexible and especially suit to the water fluctuation during flood and drought.



Solution 3.

Float ship is similar to float bowl, but more suitable to main canal with big flow rate and low charge head.



2.About Filter system



3. Middle water filter system

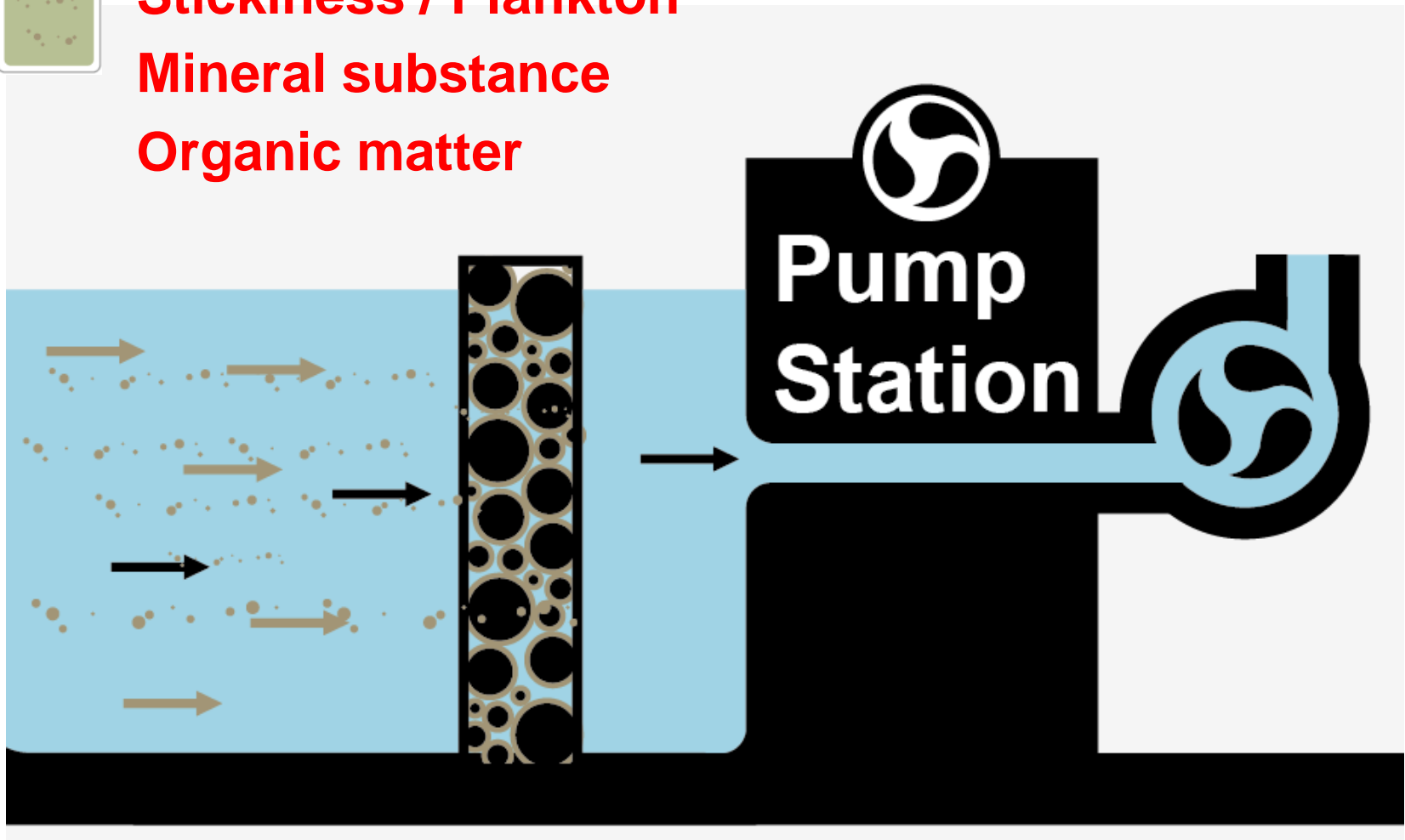
2.About Filter system



Stickiness / Plankton

Mineral substance

Organic matter



Last step, use cobblestone to filter the stickiness from the middle water.

2.About Filter system



Stickiness will be absorbed when flowing through the cobblestone

2.About Filter system

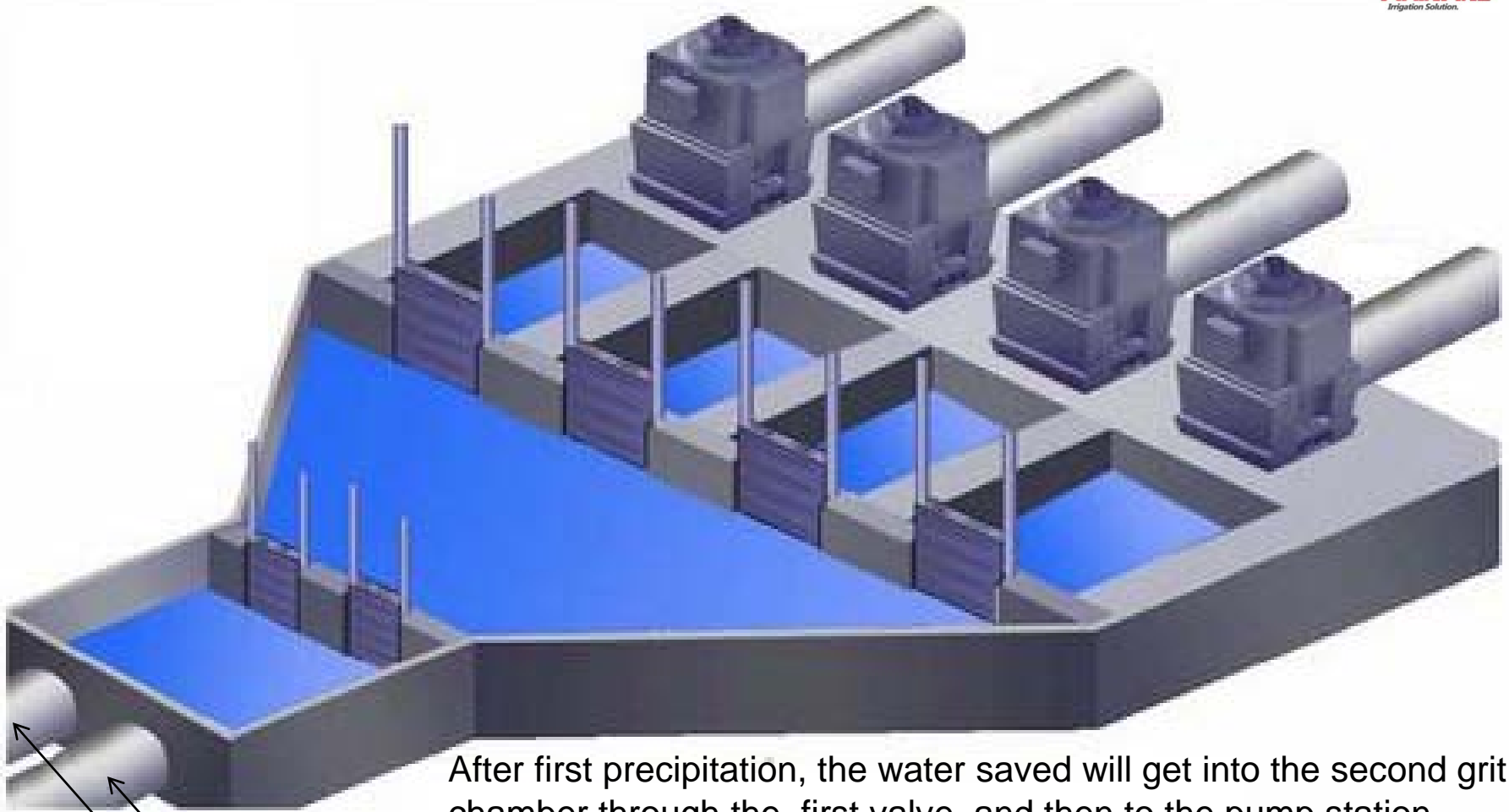


Stickiness will be absorbed when flowing through the cobblestone.

2.About Filter system



Pump station



After first precipitation, the water saved will get into the second grit chamber through the first valve, and then to the pump station through the second valve.

There is a large amount of sediment in Nile, , multi-level impurity precipitation can reduce the impact on pumps and pipes.

At last, regulate dredging will promise the work of this system.







热烈欢迎各位领导莅临指导

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2.About Filter system

Pump

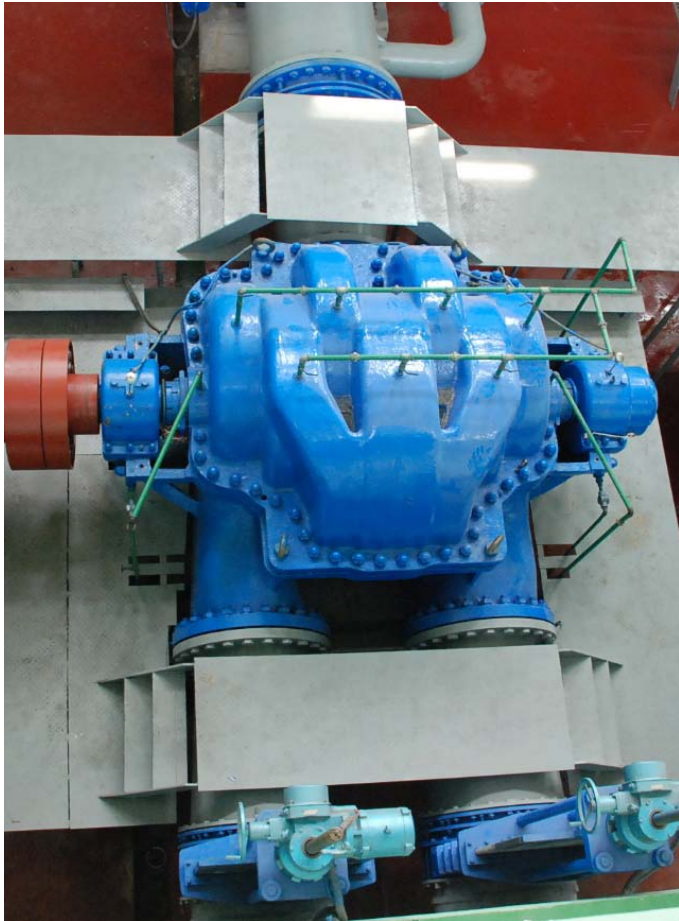




Pump choice

With huge amount of sediment, Nile water will increase the axial force and rotor wear of the pump and decrease the efficiency.

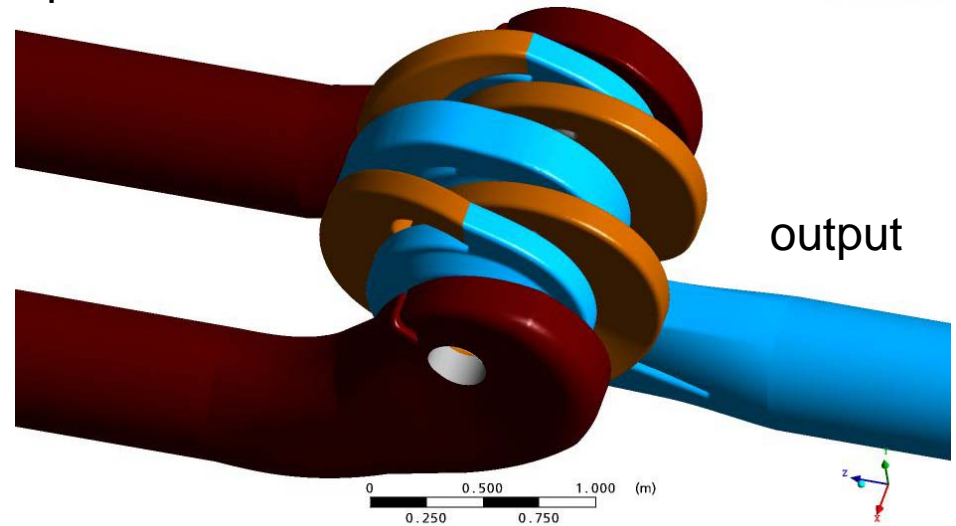
output



input

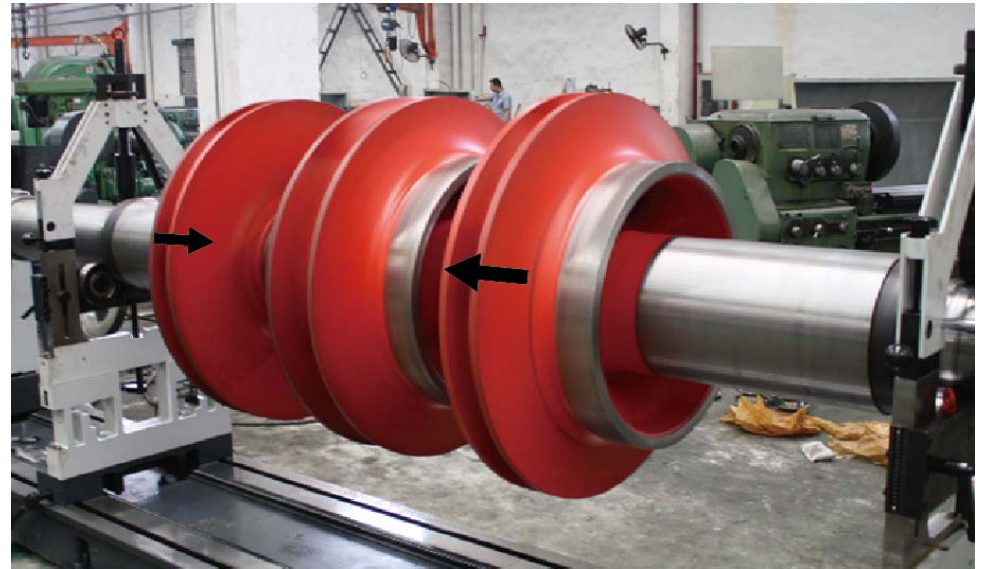
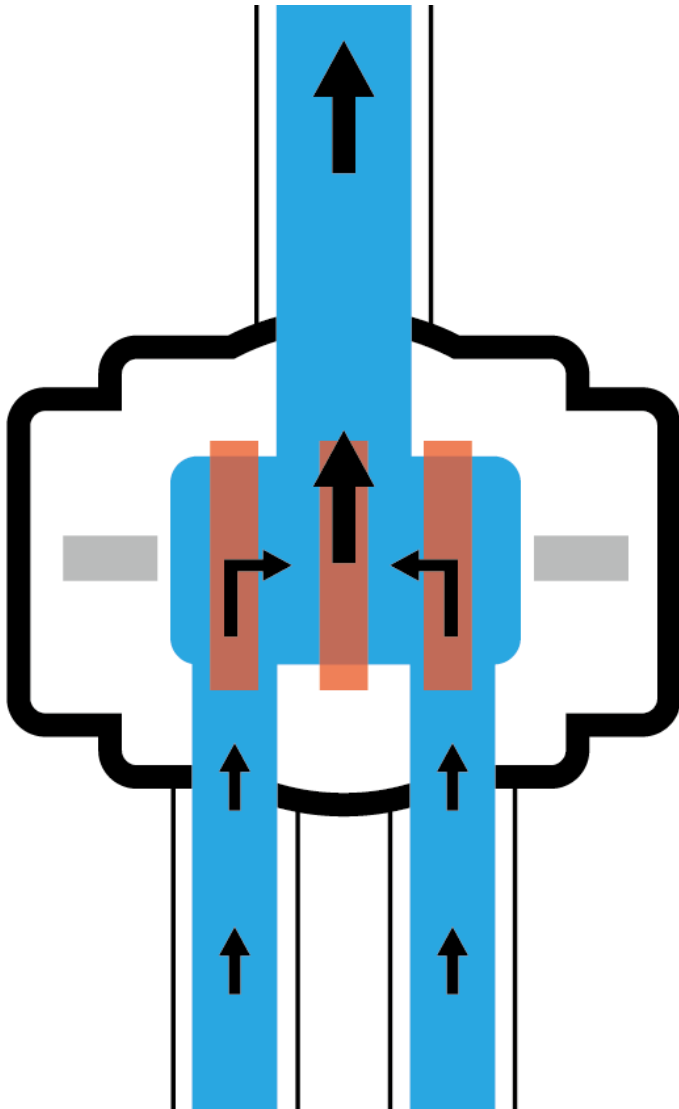
input

input



output

Introduction of Chinese Yellow river pump station



Introduction of Chinese Yellow river pump station

This pump has two inputs and one output. The inputs can offset the bidirectional axial force and reduce the degree of rotor displacement, which greatly reduces the extent of rotor damage and prolong its life.



This pump starts working since June,2010 and still perform well as expected with the characteristic of low vibration and noise, high flow and lift.

Performance data

This pump can be operated at an average sediment concentration of 25 - 30kg/m³ and average particle size of 0.02 - 0.25mm condition.



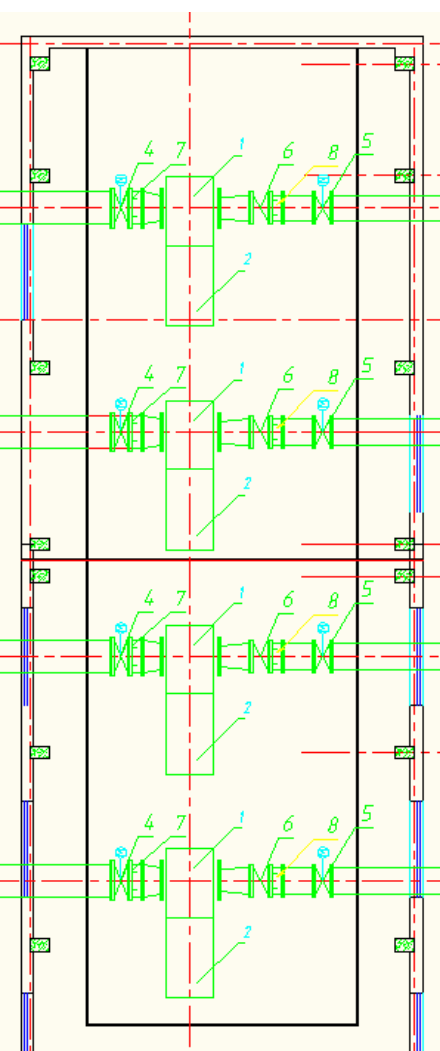
Model	Flow	Head	Speed	Efficiency	NPSH
	m ³ /s	m	r/min	%	m
600-78×2	1.2	155	994	83	9
600-93×2	1.42	183.6	996	84	8.9
800-78×2	2.5	148	747	85.5	9.5

Surface hardening to the pump body and overshadowed parts.



Pump cover: ZG230-450 antiwear coating
Impeller: Q235-A steel plate welding
Axle sleeve: ZG270-500+Ni60
Sealing ring: ZG270-500+Ni60





Scheme of arranging the filter, pump, check valve, hammer protection and main pipe.







1# 水泵
安装现场



Thank you

