

**ROYAL IHC**

# **(RE)VITALIZING RESERVOIRS WORLDWIDE**



**THE TECHNOLOGY  
INNOVATOR.**



# SEDIMENT MANAGEMENT



**SEDIMENTATION IS A NATURAL PHENOMENON IN RESERVOIRS**

## Background

*To keep reservoirs at the desired capacity and increase dam life cycle, sedimentation has to be managed. Royal IHC specialises in integrated sediment management solutions meeting economic, environmental and engineering standards. IHC's approach is based on a long-term plan combining consultancy, impact assessment (together with our partner Deltares), equipment and re-use of sediments (together with our partner NETICS).*



## SOLUTION FOR A GLOBAL PROBLEM

To meet the current and future global need for (renewable) energy and water resources, (hydro-)dams and their respective reservoirs have to be maintained.

The risk of power outages, flooding and dam failures increase when sediment balance is not properly managed. Deforestation, increasingly heavy rainfalls and extended periods of drought all amplify the problem. Making it even more important to have a proper sediment management plan in place.

Royal IHC, building on 375 years of Dutch water engineering experience, helps both public and private owners to manage the sedimentation by providing consultancy, dredging equipment and expertise on the re-use of sediments. By teaming up with local experts, research institutes and contractors Royal IHC helps to

build local capacity.

Royal IHC is a globally operating provider of services and equipment to the dredging, offshore and mining & tunnelling markets. IHC's innovative and high standard technology enables clients to outperform in their respective field. This state-of-the-art technology also contributes to solving the world's challenges of rising sea levels, energy demands and ever-growing search for technology resources.

This philosophy comes together in the field of sediment management as well. Based on high performing equipment, engineering excellence and partnership IHC will help to push local economy, strengthen the resilience of cities and keep renewable energy goals in sight.



# DREDGING EQUIPMENT



**IHC BEAVER® CUTTER SUCTION DREDGER**

Royal IHC has the necessary hydraulic dredging equipment inhouse. The equipment is easily transportable to remote locations and powerful enough to efficiently perform any kind of dredging project. The equipment most suitable for a reservoir project are:

## **IHC TT-PUMP**

This submersible dredge unit can be operated from excavators, suspended from cranes, or fitted to small pontoons with hoisting or ladder arrangements. Its versatility is due to its compact build and flexibility in application. It is also easy to handle, operate and maintain.

## **IHC BEAVER® (ELECTRIC)**

The IHC Beaver® is well known for its robust construction, reliable operation and excellent performance, resulting in a cost-effective solution. For reservoir dredging application it can be operated all-electric to adhere to environmental restrictions.

## **IHC OTTER**

The IHC Otter is a range of compact dredgers used as a platform for deploying the well-known IHC TT-Pump, providing customers with a compact, cost-effective solution to dredge slurry for smaller dredging projects. The IHC Otter is mainly used to dredge silt and medium sand. It combines the advantages of the IHC TT-Pump unit into a single dredging solution.



**IHC OTTER**



**IHC TT-PUMP**

# A SOLUTION FOR ALL



## RESERVOIR SEDIMENT MANAGEMENT

Proper reservoir sediment management benefits many stakeholders. However, the setup of reservoir sediment management may differ per project. Royal IHC acknowledges the multi-level stakeholder involvement necessary for the issue at hand. Depending on the local situation Royal IHC services dam owners, government authorities or contractors. Bringing together all parties involved is key in realizing these projects and actually adding value on social, economic and environmental levels.

### **RESERVOIR SEDIMENT MANAGEMENT FOR DAM OWNERS**

Through active sediment management, the life cycle of a dam is improved. Increasing capacity and restoring sediment balance ensures optimal operations.

### **RESERVOIR SEDIMENT MANAGEMENT FOR CONTRACTORS**

Royal IHC is not a contractor and will therefore always look for local partners that can run and operate the project. As such, it offers an opportunity to create business opportunities and co-develop expertise by partnering with Royal IHC.

### **RESERVOIR SEDIMENT MANAGEMENT FOR LOCAL ECONOMY AND GOVERNMENT**

Dams and their reservoirs play a vital role in local economies. The installed base, therefore, has to be maintained. Royal IHC not only ensures continuity it also strives for growth. By developing dredging expertise and re-use of sediments, new or additional business models arise that strengthen the local economy.

### **A HIGHLY NECESSARY SOLUTION**

Often, short-term, less efficient and costly alternative solutions for sedimentation problems are practiced. IHC believes that flushing, new build or heightening a dam can be avoided with a proper dredging plan in place. Worldwide, key advisory organisations and multilateral financiers acknowledge the importance of maintenance by opening up their resources, both funding and expertise, and drive for sound day to day operations.

The integrated approach of combining consultancy, equipment and re-use options pushes IHC and our customers to look at the challenge in a clear, honest and positive way.



# RE-USE OF SEDIMENT



**GEOTEXTILE TUBE BEING FILLED WITH SEDIMENT**

Royal IHC, together with sediment experts from NETICS, have developed several ways to beneficially re-use the dredged sediments from reservoirs. Depending on local circumstances Royal IHC consultants can advise on the best practice. Some of the most commonly applied re-use options are:

## **RE-ENTRY DOWNSTREAM**

The downside of dams is that nutrition-rich sediments no longer gradually make it downstream. This leads to unbalanced ecosystems. A continuous or rotational dredging scheme can make sure sediments are re-entered downstream.

## **FERTILIZER**

The sediment can also be directly reused as fertilizer for agricultural purposes in the region. By creating a dumping site near the dam local businesses can transport and distribute the sediment onto their lands.

## **BUILDING WITH NATURE**

In some cases building with nature is an interesting option to consider. Sediment can be used to create land and by doing so it can beneficially change the run of the river. These new pieces of land often serve an ecological purpose.

## **BUILDING BLOCKS**

NETICS have developed a technology which enables otherwise redundant sediments into building blocks for basic construction needs. By re-using the sediment in that way, small economies can thrive on the potential business.



**SAND CAN BE RE-USED AS BUILDING MATERIAL**

## **ANTI-EROSION GEOTEXTILE TUBES**

One of the major contributors to increased sedimentation is erosion. Royal IHC can help set up a system where sediment is re-used as material to fill up the so-called geotextile tubes along the river banks.

## **RAW MATERIALS FOR CONSTRUCTION**

Thanks to our mining expertise and in-house venture MEDUSA, Royal IHC knows the value of raw materials and using them effectively. This option also has a positive effect on local economies as contractors and construction companies can subsequently develop new business opportunities.



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