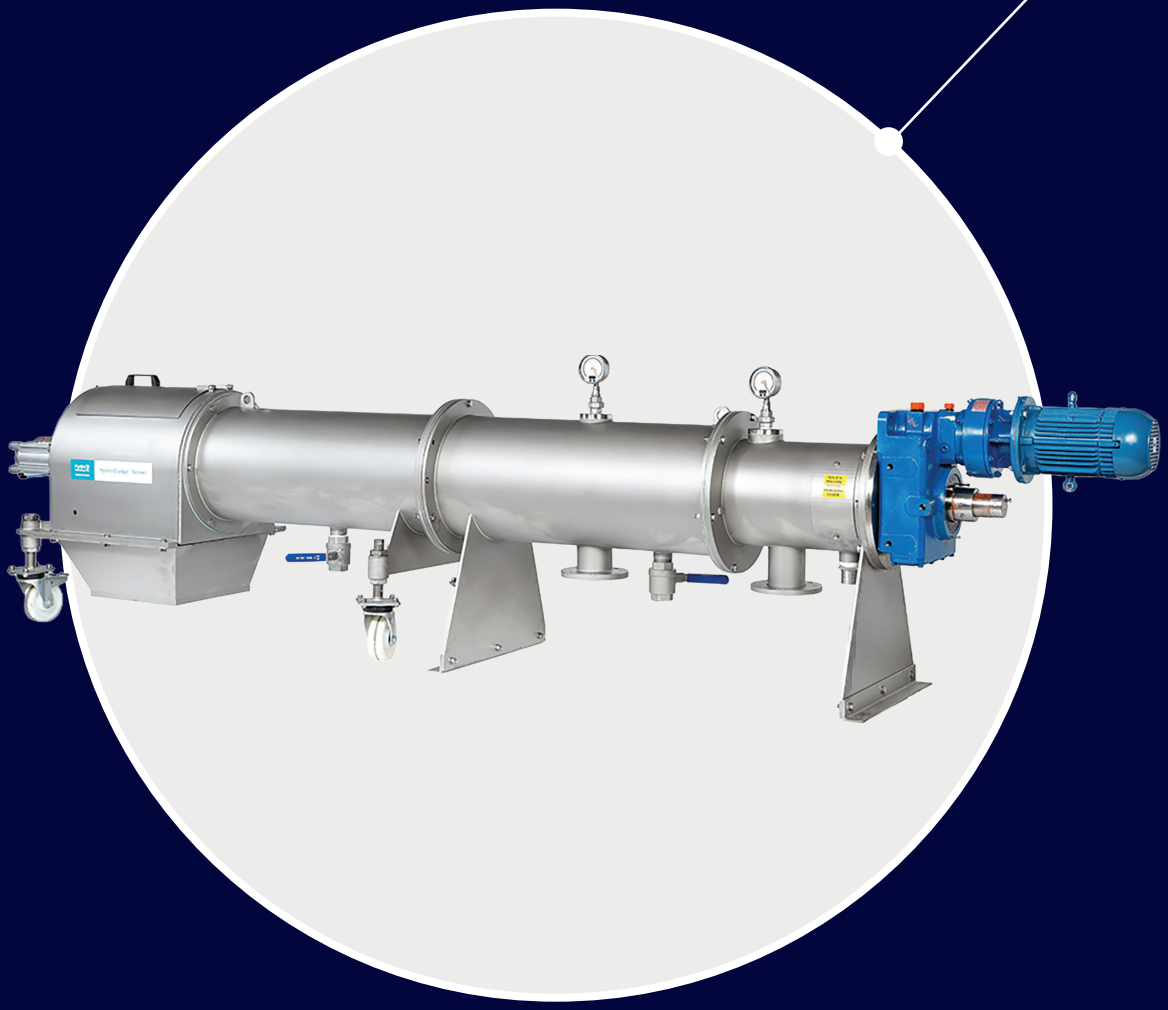
Hydro-Sludge® Screen

Oldcastle Infrastructure™
A CRH COMPANY



# Pressurized In-Line Sludge Screen

*Engineered by Hydro International*

# Hydro-Sludge® Screen

## Reduce solids handling costs and improve downstream treatment efficiency.

The Hydro-Sludge® Screen is an in-line pressurized device that screens unwanted debris from sludge and dewaters the material in one operation. Engineered by Hydro International, the system is designed for performance in this challenging application. The enclosed system reduces odor problems, has no washwater requirements, and allows for a pressurized discharge.

**Applications**

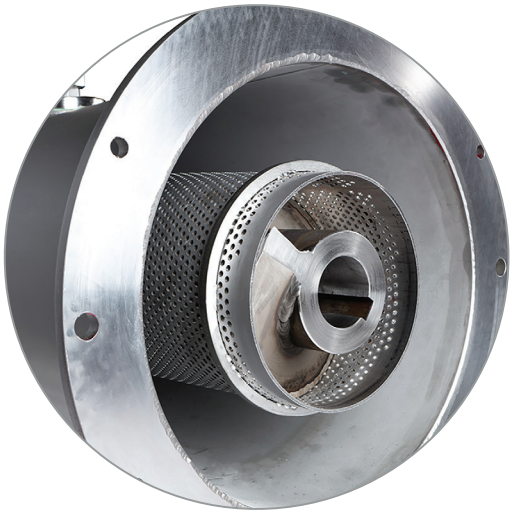
- Screening primary, secondary, and combined sludges
- Industrial screening from direct tanker, pumped feed, or combined sludges
- Maritime ship-board preliminary treatment

**Benefits**

- In-line design allows for pump-through operation, creating a pressurized discharge at the effluent connection for flow to elevated processes.
- Screening removal and dewatering in one operation with no washwater requirements
- Fully automatic for continuous or intermittent screening of sludges with varying dry solids content
- Enclosed system minimizes odors
- Standard stainless steel feed and discharge ends withstand high torque loads with longer equipment life
- Reinforced dewatering zone screen for drier solids with extended operational life
- PLC based controls and HMI are easy to use and operator friendly
- Maintenance friendly power reverse function, inlet access hatch, and extended discharge area

**Design Notes**

- Augers are available in cost-effective and long-lived carbon steel or optional stainless steel
- Fully automatic for either continuous or intermittent screening of sludge with varying dry solids content
- 3-10 mm diameter screen perforations
- Drain connections allow easy access for maintenance
- Power reverse function in manual mode to allow the retention cone to be backed off without disconnecting the air supply
- PLC based controls & HMI are easy to use and operator friendly



Visit the Hydro-Sludge® Screen product page to learn more. Hydro-Sludge® Screen

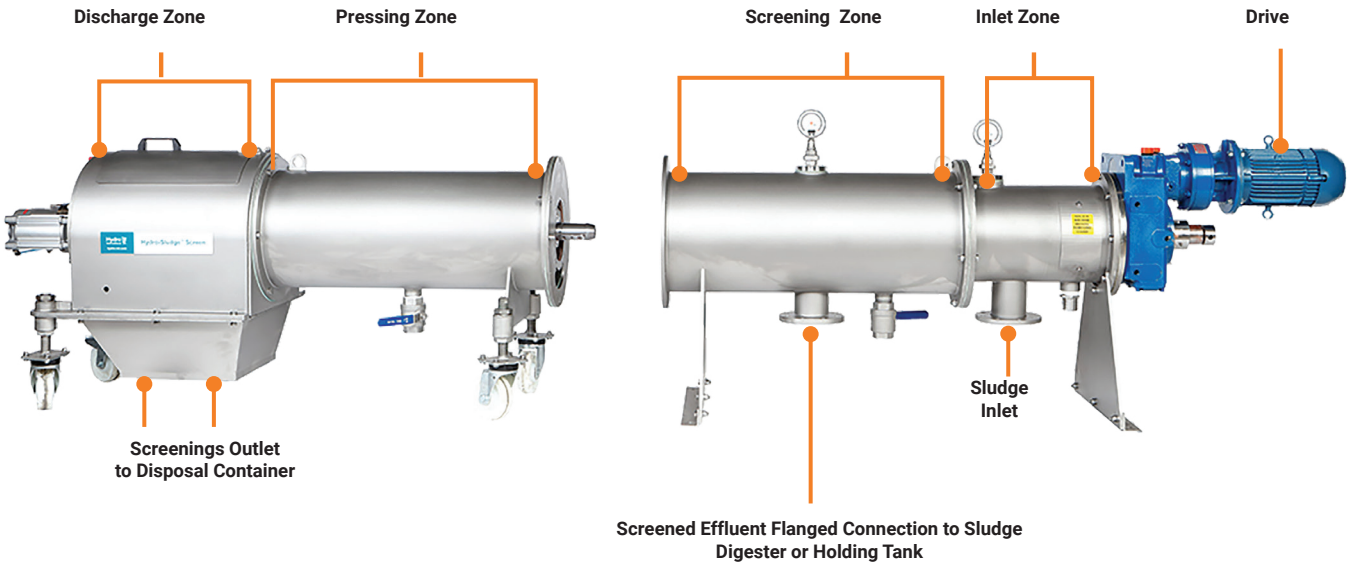
## How it Works

The primary components of the Hydro-Sludge® Screen are the inlet, screening zone, pressing zone and the screenings discharge area. The unscreened sludge is pumped to the inlet and directed into the screening zone. Sludge flows through the perforated screen and exits via a flanged connection. Non-compressible solids larger than the 0.2 in. (5mm) perforations are retained within the screen basket and transported to the dewatering zone by the rotating screw made of durable cast iron or carbon steel.

The separated solids are further concentrated in the pressing zone, transported by the pressing screw, and compacted into a plug under gradually increasing compression. This is achieved by the regulation of the backpressure cone against the compacted screenings. Liquid from the pressing zone is drained through the fine perforations in the reinforced dewatering screen, and fed back with the drained sludge from the inlet screens.

As the screenings plug is formed, the drive load increases pushing the screenings against the backpressure cone. The drive load is monitored and converted to a pneumatic pressure, which adjusts the backpressure on the cone to release solids. The dewatered solids fall through the screenings outlet and are collected in a solids receptacle for final disposal. Unit operations are controlled by a PLC control panel with an HMI screen. Adjustments to operating parameters are easily made at the control panel.

**Hydro-Sludge® Screen**



## Maintenance Friendly Features

With a range of screen sizes, the Hydro-Sludge® Screen reduces debris accumulation in downstream processes and improves overall treatment effectiveness. The system removes solids early on in the process that would otherwise reduce downstream sludge treatment efficiency and minimizes the potential for clogging.

The reverse function, access hatch, and extended discharge area makes routine inspection, cleaning, and maintenance activities quick, simple, and safe. Drain connections allow easy access for maintenance.

The self-lubricating sleeve on the retention cone eliminates the need for greasing and keeps the motor load consistent. Increased retention cone travel allows easy access to clean out the screenings plug during infrequent screen replacement.

A bolted end plate on the discharge end allows easy access and replacement of the retention cone without the need to drain or split the machine.

**Hydro-Sludge® Screen - current standard stainless steel process components (front) and legacy model with cast iron process components (back).**

| Hydro-Sludge® Screen Throughput | |
|---|---|
| % Dry Solids Content | Throughput - gpm (L/s) |
| 0-1 | 660 (42) |
| 2 | 485 (31) |
| 3 | 420 (26) |
| 4 | 350 ( 22) |
| 5 | 330 (21) |
| 6 | 310 (19) |
| 7 | 265 (17) |
| 8 | 240 (15) |
| 9 | 220 (14) |
| Dimensions: Inches (meters) 26” x 37” x 160” (0.6 x 0.9 x 4.1) | |

The figures in the table above are based on flows through a two directional 5 mm (0.20”) perforated screen and should be used as a guide only. Other site specific factors such as the content of the coarse material, etc. will influence performance.

Case Study

# Hillsboro, OR Hydro-Sludge® Screening improves phosphorus recovery system efficiency

**Owner**

Rock Creek Advanced Wastewater Treatment Facility

**Benefits from Cleaner Sludge**

Hydro-Sludge® Screen systems helped improve the performance of Rock Creek AWWTF's nutrient recovery and cogeneration facilities in numerous ways.

- Reducd sludge loading and handling costs
- Provided additional treatment options
- Increased sludge treatment efficiency
- Maximized recovery of phosphorus to sell as high-value fertilizer

## Objective

Improve sludge quality to allow plant to recover phosphorus more efficiently for re-sale as agricultural fertilizer.

## Solution

Hydro-Sludge® Screen improved sludge quality and increased the efficiency of their phosphorus recovery facility.

## Situation

The Rock Creek Advanced Wastewater Treatment Facility (AWWTF) in Hillsboro, Oregon serves a rapidly growing community southwest of Portland. At the time of writing, the award-winning plant had the largest municipal wastewater nutrient recovery facility in the world. The facility recovered more than 20 dry tons of biosolids each day that is then sold to farmers throughout the state as a soil amendment or as commercial grade fertilizer.

The plant also has a significant waste-to-energy cogeneration operation. The methane generated on-site supplied 30% of the plant's total electrical needs through on-site methane generation. Each year, the plant generates more than 5 million kilowatt-hours on-site.

## Sludge - A Precious Commodity

With the combined electrical cost savings from their methane cogeneration, and a significant revenue stream from fertilizer sales - the plant's sludge was a very valuable asset. The plant was using an Ostara phosphorus recovery system to improve nutrient removal, reduce chemical costs and provide additional revenue. After unsatisfactory experiences with the performance and aftermarket support offered by the prior sludge screen manufacturer, plant staff elected to consider an alternative supplier for the sludge screening technology.

## The Solution

Hillsboro Clean Water Services contracted with the consulting engineer Brown & Caldwell to design a system to help improve sludge quality at the Hillsboro Rock Creek wastewater treatment plant.

Three Hydro-Sludge Screen systems were selected to provide clean sludge to the phosphorus recovery system and increase the capacity of downstream sludge treatment processes. The three unit Hydro-Sludge Screens are used to screen pumped primary sludge with a 2% total solids concentration.

## The Outcome

Since installation, the plant has been happy with the output and performance of the systems. When the local regional Water Environment Association (PNCWA) held their annual conference in nearby Vancouver, WA the plant was selected for a site tour which was well attended by conference participants.


Hydro-Sludge® Screen Arrives On-Site


Operating Hydro-Sludge® Screen Systems at Rock Creek

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