



Wassara

# WATER-POWERED DRILLING IN EXPLORATION



# STRAIGHT FORWARD DRILLING

Wassara offers a revolutionary complement to your mineral exploration drilling. Now you can drill many times faster in overburden and in waste rock where you are not interested in the samples. Our unique water-powered drill hammer will take you much faster to the interesting zones with the same accuracy as standard core drilling, using your standard core drill equipment.

## DOWNRIGHT FASTER DRILLING

The Wassara water-powered system offers many benefits in mineral exploration drilling applications and is a great complement to your core drilling. It is much faster and more cost-effective – still with the same quality and accuracy as core drilling. Wassara can be used for both surface and underground exploration, together with your standard core drilling rigs.

Just like core drilling, the Wassara drill hammer is depending on water. The main difference with Wassara is that you need more water, but during a shorter period of time. This gives approx. the same total water consumption as conventional core drilling.

### Front-edge technology with well-proven results

The Wassara technology is at the front-edge of the drilling development. It is proven from more than 25 million metres drilled in mining production and various ground engineering applications.

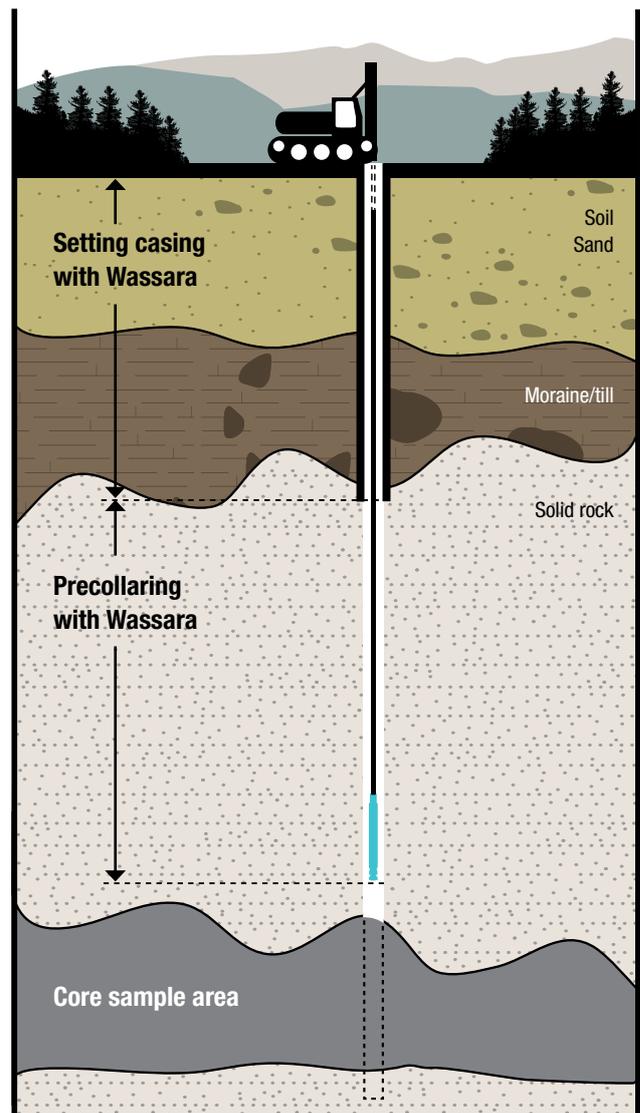
## OPTIMAL FOR BOTH SURFACE AND UNDERGROUND DRILLING

### Overburden drilling and setting casing

Wassara is faster than common methods for casing. The higher penetration rate reduces the drilling time dramatically. This gives a total water consumption that is approx. the same as conventional core drilling. No extra equipment is needed – your existing water pump for core drilling can be used and standard core drilling tubes can be used when setting casing.

### Underground drilling

The Wassara system is also superior when drilling underground without retrieving samples. When reaching the zone for sample retrieving, simply switch to your standard core drilling equipment.



Wassaras is optimal for setting casing as well as precollaring in all formations

# THE KEY BENEFITS WITH WASSARA

## Significant time saving

When using water-powered drilling without retrieving core periodically, the time saving is significant. This means that the hole normally is drilled within just one or two runs.

## Faster penetration rate

With Wassara, the penetration rate is up to 5 times higher than with core drilling. The penetration rate remains through the whole distance and the hammer is much less dependent on ground formation. You will be able to drill efficient even when you don't have experience from the site before.

## Less sensitive to the formation

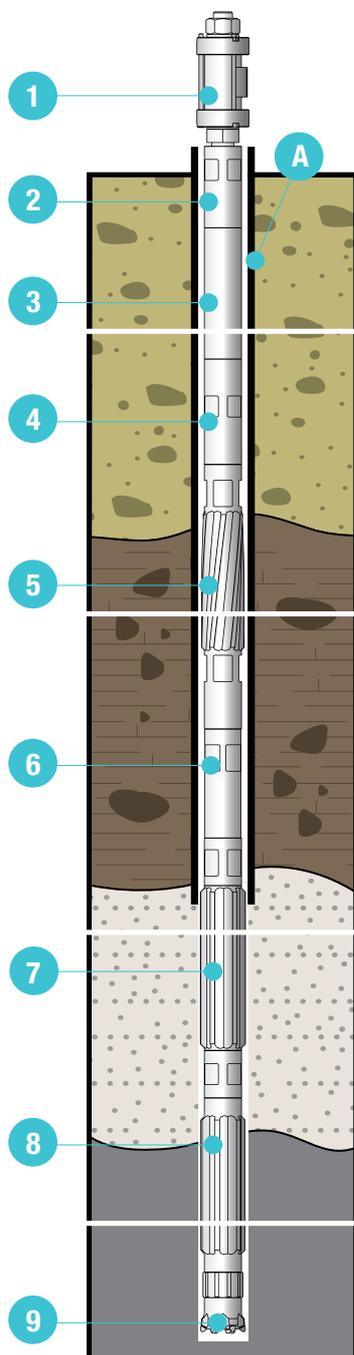
The water-powered drill hammer is capable of penetrating any formation. Hard rock, sand, lime stone, granite, moraine/till or soil doesn't matter. There is no need to switch to another technology before reaching the core sample zone.

## High quality – drills straighter with less deviation

The low up-hole velocity of the return water enables a tight clearance between the hammer and the bit. This gives the same bore-hole straightness as core drilling.

## Cost effective

By using Wassara as a complement in your precollaring drilling, the project times will be reduced drastically.



# THE WASSARA SYSTEM

1. High pressure water swivel
  2. Adapter
  3. Standard rod for core drilling
  4. Adapter
  5. Weight rods
  6. Check valve
  7. Stabilizer rod
  8. Wassara water-powered drill hammer (W70)
  9. Drill bit
- A. Casing

The system is a complement to your core drilling in N size (76 mm)

## Specific details

5. To avoid the risk of wear caused by the vibrations from the percussion hammer, we recommend using weight rods as a part of the drill string.
8. The water-powered drill hammer itself operates at approx. 70 bar during casing setting. Solid rock drilling requires up to 180 bar at the hammer. This gives a very powerful drilling.
9. The PCD (poly-crystalline diamond composite) bits give you limited wear of the bit diameter, a straight hole and an optimal bit life. Classic TC (tungsten carbides) bits can be used if the formation is favourable.



**wassara**

### **Wassara – cost-efficient and environmentally friendly drilling**

LKAB Wassara is a Swedish company developing and manufacturing unique water-powered drilling systems for high performance in surface- as well as underground drilling operations. The heart of the Wassara drilling system is the world patented water-powered down-the-hole hammer.

The drilling systems have been used for more than 20 years in various applications within many industries; mining, exploration, ground engineering, dams, geothermal, marine, oil & gas storage. Our experience covers more than 25 million drilled metres working in different locations around the world. Reference studies can be found on our website.

LKAB Wassara was founded in 1988 and is owned by LKAB. LKAB is an international high-tech minerals group that produces iron ore products for the steel industry and other mineral products for many other industries and applications.

Explore more at [www.wassara.com](http://www.wassara.com)

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