

# “ Springs ”



Advanced Center for Water Resources Development And Management  
Pune



# Groundwater



# What are Springs

Springs are indicated by locations or points on the ground surface, where water from beneath the ground emerges on to the surface.

Common example is of an overflowing unconfined aquifer.

Points of Groundwater Discharge





# Springs and other water sources



## A few Characteristics

Discharge from spring may be constant or variable.

Springs can be **perennial** or **seasonal**.

Discharge from a spring may vary between from a trickle to about 100 m<sup>3</sup> per second.

Temperature of spring water may vary from mean atmospheric temperature to lower or higher -*even boiling temperatures*. Hot -water springs are common to - many parts of the world.

Difficulty in access

Variation in discharge

Quality



# Types of Springs

It is necessary to identify the type of spring in order to understand how they behave in space and time:

- Depression Spring
- Contact Spring
- Fault Spring
- Fracture Spring
- Karst Spring

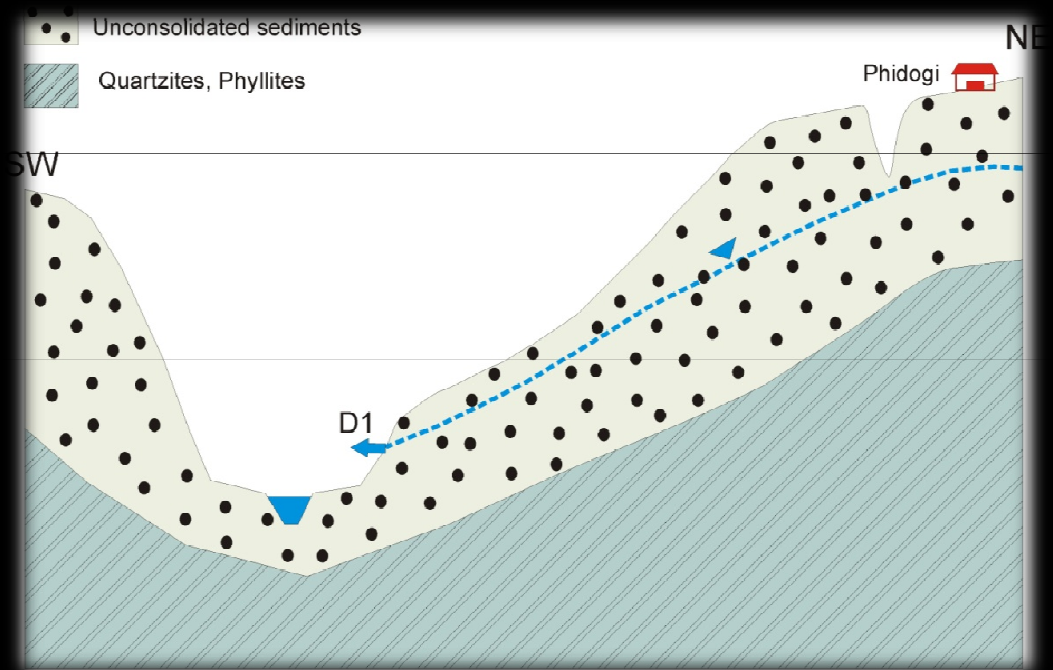


# Depression Spring

Formed at topographic lows.

Formed when water table reaches the surface due to topographic undulations.

A local flow system is created and a spring is formed at the local discharge zone.

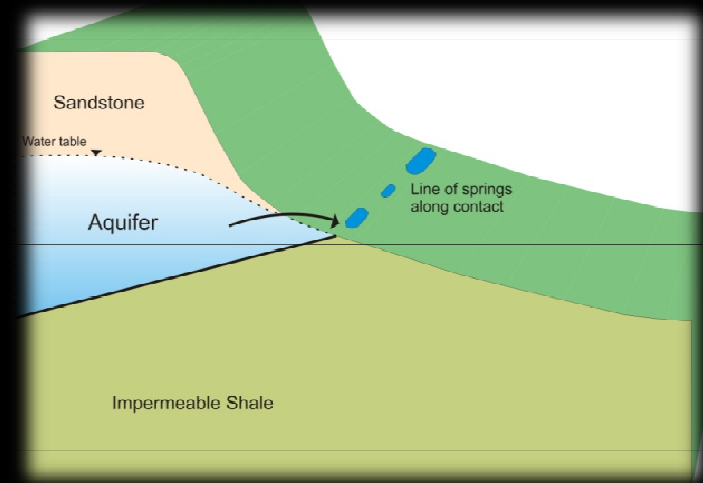


# Contact Spring

Formed at places where relatively permeable rocks overlie rocks of low permeability.

A lithological contact is usually marked by a line of springs.

Such springs are usually associated with perched aquifers in mountains.

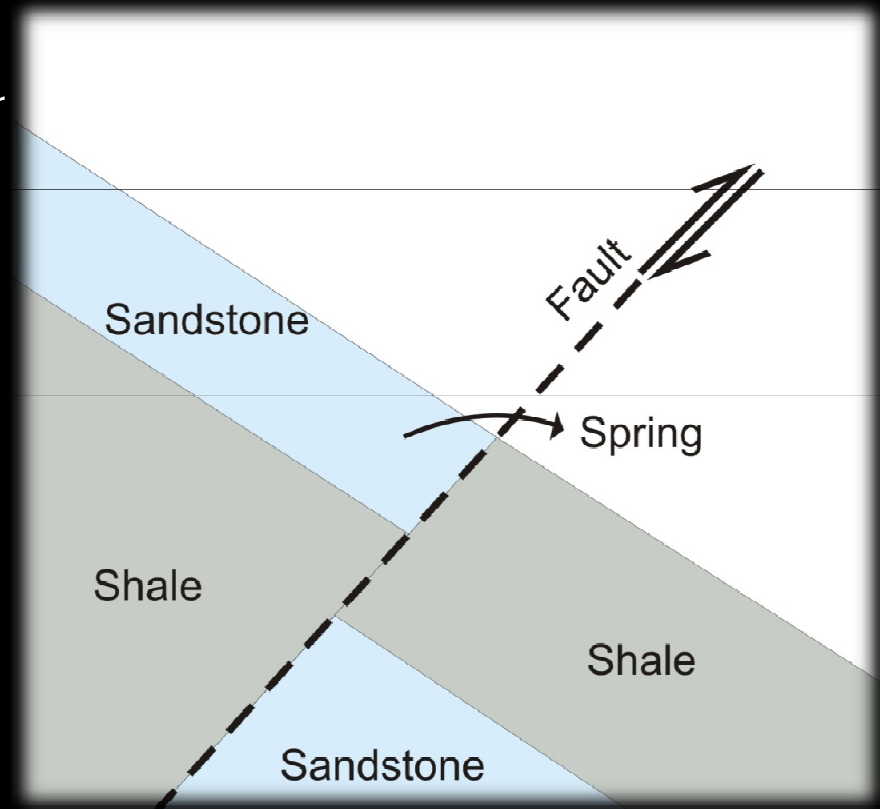




# Fault Spring

Faulting may also give rise to conditions favourable for spring formation as groundwater (at depth) under hydrostatic pressure (such as in confined aquifers) can move up along such faults.

An impermeable rock unit may be brought in contact with an unconfined aquifer due to faulting.



# Joint/Fracture Spring

Occur due to existence of jointed or permeable fracture zones in low permeability rocks.

Movement of groundwater is mainly through fractures that may tap shallow as well as deep aquifers.

Springs are formed where these fractures intersect the land surface.



# Karst Spring

Limestones host many springs.

Springs in limestone terrains can be interconnected to topographic depressions caused by sinkholes – depressions in the ground surface cause due to the dissolving of limestones below.

Large quantities of water move through the cavities, channels, conduits and other openings developed in limestones.





# Spring water Management : Need for a multidisciplinary approach

