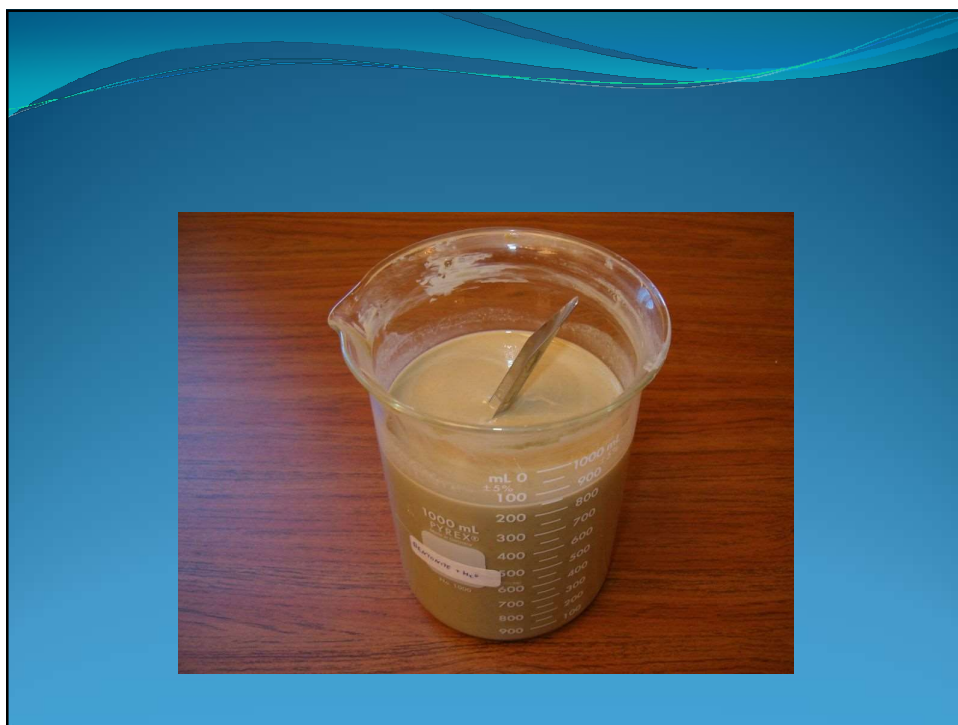
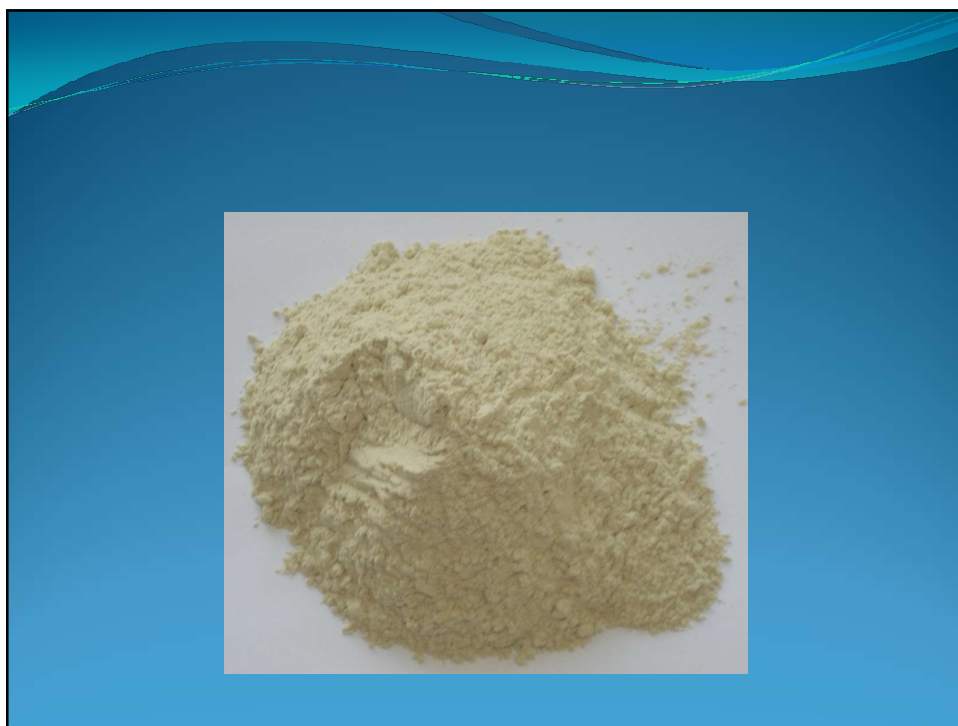


Bentonit Slurry

Dipak Shrestha

Drilling fluids

- “Drilling mud” means a carefully engineered drilling fluid.
- Water
- Plastic to Highly plastic clays
- Bentonite
- Polimers



Bentonite

Bentonite is the name used for a range of clays that can swell and gel when dispersed in water. The name “bentonite” originates from the discovery of this type of clay near Fort Benton, USA, in the 19th Century. This was a natural sodium bentonite, and has been mined extensively for many years in Wyoming and

Dakota for oil well drilling applications. Bentonite is now used extensively throughout the world in civil engineering, but the cost of transporting original “Wyoming” bentonite from the USA has led to the use of alternatives from other sources. A large proportion of bentonite now used is therefore from other parts of the world.

- Wilbur C. Knight coined the term “Bentonite” in 1898 when the world’s largest deposit was discovered in the Benton Shale near Rock River, Wyoming. **Bentonite Direct**’s supplies of Bentonite come from mines in this region.
- **Bentonite** has been called the mineral with 1000 uses. A highly absorbent clay, it was originally known as “mineral soap” and “soap clay.”

Uses of Bentonite

- Agriculture and Animal Feeds
- Asphalt Emulsifiers
- Ceramics
- Construction and Civil Engineering
- Detergents
 - Environmental Sealants
 - Horizontal Drilling
 - Household Cleaners
 - Industrial Coatings
- Iron Ore Pelletizing
- Metal Casting
- Oils/Food Processing
- Oil and Gas Drilling
- Paints, Dyes and Polishes
 - Papermaking and Paper Recycling
 - Pet Products
 - Pharmaceuticals, Cosmetics and Medicine
 - Wastewater Treatment
 - Wine and Juice Clarification

Uses in Civil Engineering

- Bore piles
- Diaphragm wall
- Boreholes in site investigations
- Cut off walls
- Sealing water tanks
- Tunnel

Purpose of Drilling Mud (Bentonite) in Bore piles

- Keep drilled / bored particles in suspension
- Formation of Filter cake/ Wall cake
- Hydrostatic Balance / Borehole stabilize

Purpose.....

- Prevent flow into the soil / bore holes
- Lubricating and Cooling effect to drill bit/ chiesel
- Easeness in pumping
- Removal by scouring action of concrete

Properties of Bentonite Suspension

-

<u>Property</u>	<u>Units</u>	<u>Fresh</u>	<u>Ready for re-use</u>	<u>Before conc</u>
• Density	g/cc	<1.10	<1.25	<1.15
• Marsh viscosity	sec	32 to 50	32 to 60	32 to 50
• pH		7 to 11	7 to 12	n.a.
• Sand content	%	n.a.	n.a.	< 4

Preparation of Benotnrite

- Most high-quality or "premium" bentonite, with good bentonite properties, sold for water well drilling comes in 23 kilogram (50 pound) sacks. The amount of bentonite required to achieve the viscosities listed above ranges from one-half to a full sack per 378 liters (100 gallons).
- Good bentonite properties will be best achieved if you first mix the bentonite very thick - a full sack in a 55-gallon drum of water - and then lower the viscosity to the desired range by adding water after putting the hydrated bentonite into the mud pits. The best bentonite properties will be achieved using this method.

Preparation of Bentonite

- 4 to 6% by weight
- Curing time for 24 hours
- Mixing Plants

Tests and Apparatus



Mud Balance
For Density Tests

Viscometer



SLURRY TESTING

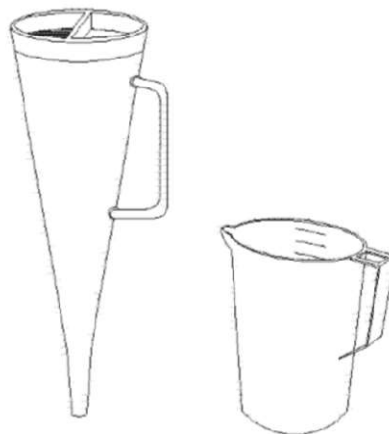


Figure 4—Marsh Funnel and Cup

pH test



SLURRY TESTING

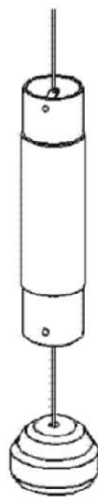
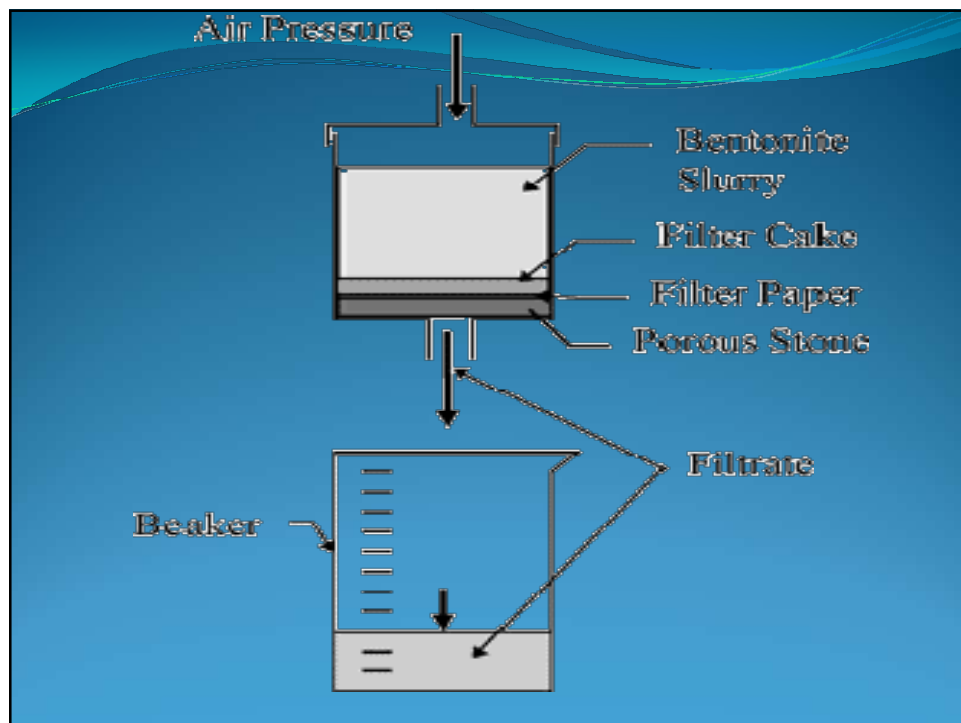
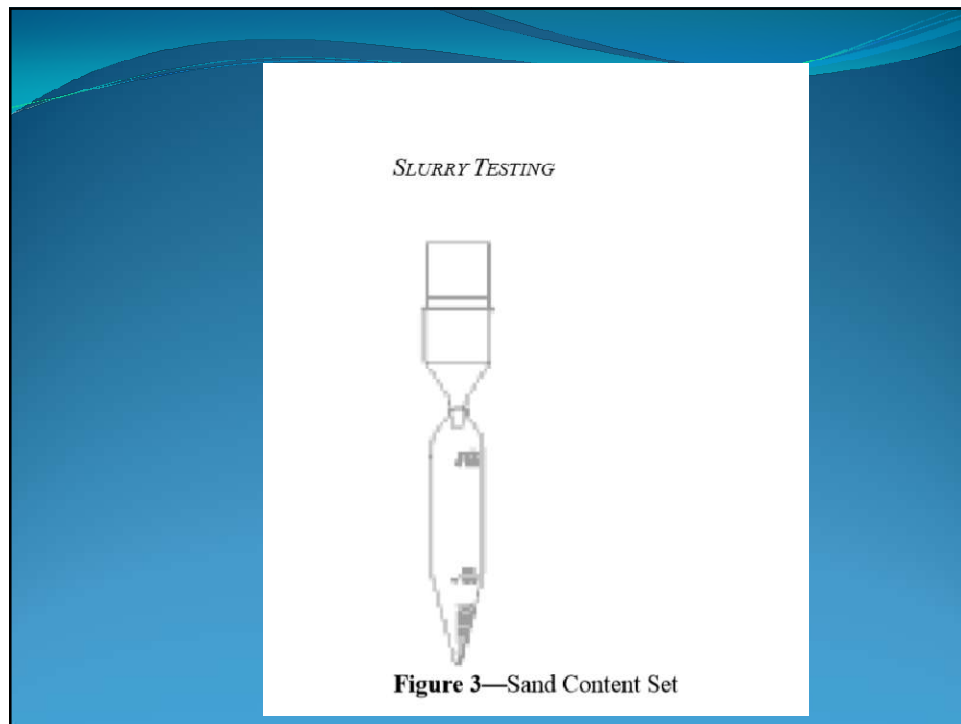


Figure 1—Slurry Sampler



- Mud balance
- Marsh viscometer
- pH strips
- Sand content apparatus
- Slurry sampler (TDT 2)
- Filter Press Test





Discussions

- What if construction time is very long
- What if the property goes beyond limit
- Desanding Plant
- Discard and Disposal