Dewatering Ultrafine Slurries
H. Salih, L. Wang, V. Patel & N. Rajagopalan

Market Need
Disposal of ultrafine slurries in an environmentally sustainable and cost-effective manner is a pressing issue for many industrial sectors – especially mining.

Osmotic Dewatering Technology
- Membrane-based technology utilizes salt solution to remove water from ultrafine slurry
- Operates at atmospheric pressure
- Mechanically simple
- Modular
- Can produce clean water

Water Flows Down an Activity Gradient

Osmotic Dewatering

Looking Forward

Relevance to Illinois
- Illinois coal mines produced 52.1 million tons of coal in 2013.
- Direct employment: 4,000; Indirect employment: 12,000
- Typical waste production from coal mining varies from 10-50%. Ultrafine waste material of the order of 10%.
- Disposal/Lifetime Liability increasingly a bottleneck.
- Beneficial reuse of dewatered coal mine waste solves liability/disposal issues; advances sustainable mining practices.
- Typical beneficial use is as backfill and other construction uses; but material needs to be dewatered first

Acknowledgements
- Illinois Clean Coal Institute
- American Coal Company

Technology Status
- IP Filed
- TRL Level: 4-5