Sand sources and test methods for SRSF

Location: Computer facility

Goal

Now that SRSFs are being constructed in India and in Honduras we need to develop standards for testing potential sand sources. In Honduras APP budgeted for importing the sand again through a company called Aquatec but that shouldn't be necessary. It should be possible to source the sand locally. In India, the water treatment plant for Ranchi apparently obtained their sand from a local river where the sand has a high silica content. We need a set of tests that can easily be conducted in country to assess.

Find the American Water Works Association guidelines for filter sand and find the ASTM tests that are recommended for filter sand.

There are 4 constraints for SRSF sand

1. No sand should be able to slide through the 0.2 mm slots in the PVC pipe
2. The sand should be hard and not prone to dissolution in acid
3. The backwash velocity required to expand the filter bed by 30% should be very close (this needs to be defined) to 11 mm/s
4. The sand bed must not have significant (this needs to be defined) stratification after backwash

The filter bed stratification after backwash may not be very significant if the bed is transitioned quickly from fluidized at 30% to settled. It is possible that the quick transition will not allow much time for smaller diameter sand to migrate to the top of the filter. This could be a lab research project or it is possible that a literature review will reveal that someone has already conducted these tests. In any case, the amount of stratification allowed should be based on a target distribution of flow between the 6 filter layers.

The challenge for this team is to develop a set of quick tests that can be conducted in the field to determine if a sand is suitable. If a sand isn’t suitable because of the wrong sand size, then this team should provide recommendations for sieve sizes to use to select an appropriate size sand. The team could practice preparing a suitable sand from a poorly sieved source by purchasing a river sand and then sieving it to get it within the specifications.