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From: Mark Galimberti [mgalimberti@vsep.com]
Sent: Wednesday, February 03, 2010 8:59 AM
To: EP, RegComments
Subject: VSep use at Marcellus Shale Flowback Water Treatment

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INDEPENDENT REGULATORY
REVIEW COMMISSION

We make a Vibratory Membrane Filtration unit which can be mounted on trailers for on-site treatment of Flowback/Frac water with the Marcellus Shale. cost to treat, using nanofiltration only, is about \$ 3.00 per 1,000 gallons, cost to treat using nanofiltration then RO to reach well below 250 TDS Chlorides, totals \$ 10.00 per 1,000 gallons. This includes membrane replacement (1/2 the cost), energy used to treat (1/4 the cost), and chemical cleaning (1/4 the cost). The byproducts remain after treatment, we call "Concentrate" is about 5% to 10 % of the total volume treat, thus easily we call "90+ % recovery". This treatment unit is mobile, trailers can be as small as 24 feet in length to handle 25,000 gal a day, up to 53 foot trailer to handle up to 100,000 gallons a day. We can meet can meet a January 1, 2011 implementation date.

We're doing this commercially, I ask if you could forward this to those internally. I can also visit and show some video clips and provide some averages of analytical results.

Regarding the NF, the short conclusion is that the nanofiltration stage produces a clear water permeate (about 95+% recovery) that is still laden with disassociated salts. The concentrate produced in this stage contains about 35% total solids of which about 30% is volatile. Thus the nanofiltration stage is removing suspended solids, colloids, organic materials, and some salts. The concentrate produced can be further thickened and conditioned such that it can be disposed in a landfill as a residual waste.

Our flowback treatment strategy is to produce a reusable water that when blended with fresh water to frac another well will have a low Langelier Saturation Index indicating minimum potential for scaling in the well and formation. The disassociated salts will then be returned to the well rather than precipitated and removed from the flowback at great expense and disposed in a landfill or deep well.

Thanks, Mark Galimberti, Sales Engineer, tel 814 861 1506, State College, PA