Questions and Discussion Topics for June 3, 2014 Stakeholder Meeting

Design

1. **Capacity (flow) for RO Units** - For larger units, we expect the RO manufacturer to have a computer model that can show the amount of water produced by the proposed design. Not all small systems have computer models available. How do we set the capacity (water produced) from the RO unit for a small system? Possible options include:
   - What if we use manufacturer's specifications for the smaller units? Is there an alternative for the smaller units?
   - Where is the line between small and large (no-model vs. model) systems? Is it 50 gallons per minute(gpm)? 300 gpm? Something else?
2. **Redundancy -** To ensure adequate treatment capacity for systems treating **primary** contaminants, we are suggesting that water systems treating greater than 7.5 MGD provide at least one redundant unit (skid, rack, tank). Effectively, this will require meeting the minimum required capacity with one unit (skid, cell, or rack), offline.
   - Is 7.5 MGD the appropriate level?
   - Should the redundancy requirement be for primaries only?
   - Should we require one extra unit?
   - What about using 110% of capacity? Other ideas?
3. **Operational Conductivity Monitoring (not to be turned in, but kept on-site for investigators)** - Last meeting, we put out the idea of continuous conductivity monitoring (15-minute intervals recorded) of feed and product water only for systems treating primary contaminants. If the system has secondary contaminants only, we proposed that the system must provide once-daily recorded conductivity.
   - What do you think of continuous conductivity monitoring for all systems treating primary contaminants? Too much? If so, what would you suggest?
   - Are there circumstances where continuous conductivity monitoring should be required for systems treating only secondary contaminants? Is once a day to little (or too much)?
   - Based on last meeting input, we removed the stratification based on community vs non-community systems. Was that a good idea?
4. **Monitoring Locations (not to be turned in) -** We have proposed pressure and conductivity monitoring on the feed water and permeate of each RO skid. We have not specified required monitoring between stages. For process control purposes, is this adequate?
   - If monitoring is required only for feed and product water (combined permeate from all stages), will this cause difficulty for the operator in determining where the failure (or problem) occurred?
   - In some cases, we realize feed water may be stable. Should we allow permeate monitoring only when the feed water quality does not significantly change?
5. **Pretreatment -** In the previous meeting, we discussed when pretreatment is necessary. At a minimum, TCEQ suggested that pretreatment must be provided when SDI > 5, turbidity > 1.0 NTU, and for any limiting parameter identified by the

manufacturer. It was suggested that "any limiting parameter identified by the manufacturer" is sufficient. What do you think? Are there other opinions?

6. **Post-Treatment**- Stakeholders suggested a defined set of parameters for non-corrosive water is difficult due to differences in water quality and the various indices for defining non-corrosive water (they may be dependent on the specific water quality). At this time, the requirement (in §290.42(n)) simply specifies that the treated water sent to distribution must be non-corrosive. Is this sufficient, or should we provide a minimum set of criteria for post-treated water quality?

Operating Limits

7. **Action Limit for Allowable Increase in Salt Passage-** Relative to baseline performance, should there be a regulatory requirement for a percentage increase in salt passage? If so, define the limit (10%, 20%, or other?).
   - Are there any circumstances where this defined limit may be different?
   - If an action limit is set, what should be the required action taken by the water system? Probe? Clean and inspect?
   - Should the action limit be in the engineering report or should it be in the rules?
   - If a percentage increase in salt passage is defined as an action limit, how many readings are required to validate the action limit? Two consectutive? Something else?
8. **Trigger Limits for Parameters other than Conductivity -** Should we define a change in pressure differential as an action limit for shutdown, maintenance, or cleaning?
   - Are there other parameters that should always be tracked by any RO system (such as temperature, pH, turbidity, chemical feed control, pump control) (but not turned into TCEQ)?
   - Should alarms be required for any of these parameters?

System Maintenance

9. **Chemical Cleaning-** In the previous meeting, a stakeholder suggested that a 10 to 20% change in pressure or salt passage could, or should, be a trigger to conduct a clean-in-place (CIP) or replace the membrane. Should we base the requirement for CIPs (or membrane replacement) at appropriate intervals on regulatory limits or should the limits be defined in the final engineering report (based on set points for changes in normalized permeate flow, salt passage, or pressure differential)?

   Is there a benefit in having regulatory limits to ensure that the system tracks these parameters, or is there general consensus that the design engineer should establish the cleaning frequency criteria prior to start-up (with consideration that the process and frequency will be modified and improved over time by the water system)?