Emerging **Utility Challenges**

Acting proactively to reduce energy usage and greenhouse gas emissions

By Christine A. Owen

Water utilities are up against a number of regulatory actions in the next five to 10 years that will impact water quality, discharges and air emission standards. While particular challenges differ from region to region and source to source, new or tightened regulations are likely to result in more investment in capital expenditures, higher operating costs and increased regulatory oversight.

Changing Climate

Potential drivers for capital investments include existing process expansion, new process implementation for contaminant removal to comply with new maximum contaminant levels (MCLs), or new process implementation related to a new water source. Changing equipment, processes and behaviors to comply with new air emission rules could have both capital and operating cost implications.

From the operational perspective, costs may increase because of new processes or increased chemical use to achieve contaminant removal. Greater regulatory oversight and scrutiny—although not readily quantifiable in dollars—easily can translate into more staff time (and possibly more positions) devoted to operating, testing, monitoring and reporting.

The possible treatment and quality regulations that may challenge utilities in the near future include: revisions to the Total Coliform Rule, a lower arsenic MCL, a new perchlorate MCL, new nitrosamines regulation, revisions to the volatile organic compounds (VOCs) MCL and implementation of the Stage 2 Disinfectant/Disinfection Byproduct Rule. Although not on the near-term radar, perception of perceived risk may drive regulation of personal care products and pharmaceuticals more quickly than the traditional science-based process.

In tandem with these contaminant rules, the federal government is on track to regulate emissions of greenhouse gasses (GHGs) through the existing Clean Air Act or new legislation. Several state governments already are moving to implement separate legislation regarding climate change; these kinds of regulations inevitably will impose additional costs on drinking water utilities.

Climate-related legislation will have an impact on water utilities through a number of avenues. Utilities need to keep in mind that emission caps, emission offsets, renewable energy standards, renewable energy credits, energy-efficiency standards and building-efficiency standards eventually will impact their bottom line.

Changes in particular matter emission for standby generators that lower emission rates will force many utilities to spend capital on new generator sets. The state of Florida, for example, requires water suppliers to have emergency power in place to supply average daily treatment and flow. Florida utilities may have to replace generator systems that are used infrequently for emergencies but are required.

Issues to Consider

The intersection between climate-change legislation and drinking water regulation is filled with new challenges for utilities. A very likely consequence of new treatment or quality regulation is increased GHG emissions. Utilities required to implement more treatment probably will increase their energy consumption. Most advanced treatment technologies (e.g., ultraviolet and reverse osmosis systems) are particularly energy intensive. More advanced treatment using more energy will result in expanded carbon footprints.

Another consideration to keep in mind is that climate change may force water utilities to rely on less pristine water sources, which, in turn, could require more advanced treatment and its concomitant increase in GHG emissions. A more stringent regulatory environment is likely to constraint a utility's ability to optimize for GHG emission reduction.

For most drinking water utilities already practicing disinfection, the revisions to the Total Coliform Rule will have minimal treatment implications. The revisions focus on clarifying reporting requirements and broadly identifying tools that can be used to resolve total coliform occurrences in distribution systems. If a utility needs to add system disinfection, additional costs will be incurred. These costs, however, generally would not be out of line with what already is expected under the existing rule.

A tighter arsenic standard will require a meaningful percentage of utilities to add treatment and will force utilities already treating for arsenic to modify their processes. Both scenarios will lead to higher chemical and media consumption, as well as increased energy use and higher GHG emissions. A new regulation of perchlorate will add to monitoring costs and, depending on occurrence and levels, potentially energy-intensive treatment. Revisions to the VOCs MCL will, in many circumstances, require increases in treatment capacity where VOCs historically have been observed. It may require the installation of treatment in new locations.

Some utilities may be able to meet a lower VOCs MCL by modifying operational practices, though even this "low-tech" solution could carry associated energy or chemical costs.

Depending on the route of control, regulation of nitrosamines may impact water, reclamation and wastewater facilities. Removal before discharge would require new treatment, and control of formation in drinking water facilities would necessitate precursor removal and/or changes in disinfection practices—all of which have financial and energy consequences.

Changes in disinfection byproduct regulation could result in changes all the way from source selection to new treatment. Removal of pharmaceuticals, endocrine disruptors and personal care products could be regulated in a number of places in the water cycle. Wherever control is mandated, however, it will require advanced treatment that has financial and GHG implications.

Solutions Summary

Utilities should be strongly motivated to act proactively and in a forward-thinking manner to address energy and GHG issues for financial purposes. Potential standards for GHG emission and energy efficiency will have to be factored into utilities' decision-making processes, which could lead to changes in operation, capital investment decisions and project prioritizations.

Utilities across the nation face this dilemma: They are expected to fulfill numerous and sometimes contradicting public health, scientific and social objectives—including providing a safe and reliable potable water supply and treating wastewater to increasingly stringent standards—while simultaneously reducing carbon footprint, achieving higher energy efficiency, adapting to climate change and planning for the future.

Water utilities must play an active role in formulating state and national policy on climate change, GHGs and quality standards. Utility perspectives and constraints need to be understood so that climate-change policies, energy efficiency and safe drinking water goals can be balanced. Regulations should be developed in a holistic fashion, taking into consideration the myriad of environmental, social and financial pressures exerted on a utility.

Utilities should be encouraged to implement solutions most suitable for their situations rather than be mandated prescribed, standard solutions. It will be important to build flexibility into our regulatory constructs as we move forward. MT

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