



40 West 20th Street
New York, NY 10011
(212) 727-2700
Fax (212) 727-1773

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Robert Simson
Division of Water
New York State Department of Environmental Conservation
625 Broadway
4th Floor
Albany, New York 12233-3500

Via email: wateregs@gw.dec.state.ny.us

Re: Comments on “Survey of Methods for Implementing and Documenting Water Conservation in New York”

Dear Mr. Simson:

On behalf of Natural Resources Defense Council (NRDC) and our 37,000 members in New York State, please accept these comments on the Department of Environmental Conservation’s (DEC) draft *Survey of Methods for Implementing and Documenting Water Conservation in New York* (“Draft Survey”).¹ As explained in the public notice accompanying the Draft Survey, the purpose of the document is to “provide additional guidance to non-public water supply withdrawers regarding appropriate water conservation measures,” in furtherance of the requirement of ECL § 15-1501 that water withdrawal permits shall require implementation of a “water conservation program” that includes all “environmentally sound and economically feasible water conservation measures.”

The Draft Survey contains valuable information, and a lengthy bibliography, concerning water conservation practices. For the reasons explained below, however, we believe that the Draft Survey fails to achieve its stated purpose *as a tool for implementing DEC’s regulatory program*. It should be revised substantially to achieve that goal.

¹ The draft document was noticed for public comment on Oct. 23, 2013, with a comment deadline of Nov. 22, 2013. See http://www.dec.ny.gov/enb/20131023_not0.html.

1. Background and Summary of Recommendations

New York's water resources, which, as Governor Cuomo has noted are "vital to the state's residents, farmers and businesses,"² are facing mounting pressures, due, in large part, to the warmer temperatures, more frequent extreme precipitation events, and higher sea levels caused by climate change. These trends are projected to only intensify in the future, leading to reduced snow cover and increased risks of flooding, summertime droughts, and, potentially, water availability.³ Meanwhile, demand for water for human uses is likely to grow, multiplying these pressures. As New York State's Climate Action Council warned in 2010:

Demand for water continues to grow, including for human consumption, agricultural use, and energy production. As other parts of the country experience large changes in drought frequency and intensity, New York's water resources may become a defining economic asset resulting in the migration of people and businesses into the state. This may bring some economic benefits, but will present new challenges as pressure on water resources increases.⁴

In this context, it is critical that New York State adopt and implement effective water conservation and efficiency policies, especially through the state's new water withdrawal permitting program.

When DEC adopted the implementing regulations for the water withdrawal permitting program under ECL Article 15, Title 15, the agency promised – in response to public comments from both industry and environmental advocates – to develop a "non-potable water [conservation] guide" to elaborate on the meaning of "environmentally sound and economically feasible water conservation measures."⁵ It appears that DEC intends the Draft Survey to be this

² "Governor Cuomo to Sign Law to Protect New York's Waters," press release, August 15, 2011; <http://www.governor.ny.gov/press/08152011LawtoProtectNewYorksWaters>.

³ Stephen Shaw, Rebecca Schneider, Andrew McDonald, Susan Riha, Lee Tryhorn, Robin Leichenko, Peter Vancura, Allan Frei and Burrell Montz, "Water Resources," *Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation in New York State* (November 2011), available at http://nyserda.ny.gov/Publications/Research-and-Development/Environmental/EMEP-Publications/~/_media/Files/Publications/Research/Environmental/EMEP/climaid/11-18-response-to-climate-change-in-nys-chapter4.ashx; and New York State Climate Action Council, *Climate Action Plan Interim Report* (2010), available at <http://nyclimatechange.us/InterimReport.cfm>

⁴ New York State Climate Action Council, *Climate Action Plan Interim Report* (2010), p. 2-23.

⁵ Numerous commenters on DEC's draft regulations (including NRDC) urged the agency to include more specific language regarding the definition of "environmentally sound and economically feasible water conservation measures" and the specific types of measures permittees would be expected to implement. DEC responded:

The Department currently has a manual (*Water Conservation Manual for Development of a Water Conservation Plan*) and Water Conservation Program Form that are used for public water supply, both of which are available on DEC's website at <http://www.dec.ny.gov/lands/39346.html>. A non-potable water guide and forms are being developed. Also, the annual reports required of each permitted withdrawal will include an update on the progress and effectiveness of ongoing water conservation measures.

(continued on next page)

guide. Unfortunately, rather than providing meaningful “guidance” – either to permit applicants or to DEC staff responsible for drafting permit conditions – the Draft Survey merely provides a menu of possible water conservation strategies, in the form of a literature review. It provides no genuine guidance to applicants or permit-writers that would enable them to identify the circumstances under which any of the catalogued measures should be considered “environmentally sound and economically feasible.” In its current form, the Draft Survey will not effectively promote achievement of the core water conservation objectives of ECL Article 15, Title 15.

We call on DEC to revise the Draft Survey to provide guidance instructing permit applicants and permit-writers on how to determine which specific water conservation measures must be included in a water conservation plan under DEC’s permitting regulations. Since the necessary revisions are extensive, DEC should re-issue a revised draft for public comment.

We further note that the effective implementation of virtually all of the Draft Survey’s recommendations on the use of recycled water and graywater will continue to be thwarted by DEC’s failure to meet its statutory obligation to issue regulations and standards on the reuse of reclaimed wastewater and graywater. Regulatory clarity is a necessary precondition for any assessment of whether such measures are environmentally sound and economically feasible by either a water withdrawal permit applicant or by the Department itself. This failure to act should be remedied at the earliest opportunity.⁶

In the following sections, we provide our recommendations on how to re-frame the Draft Survey as a guidance document, as well as recommendations to improve the Draft Survey’s discussions of specific water conservation measures.

2. DEC Should Revise the Draft Survey to Frame it as a Guidance Document, Which Explains How to Identify the Necessary Elements of a Water Conservation Plan for Any Given Permittee.

ECL Article 15, Title 15, signed into law in 2011, and DEC’s implementing regulations, adopted in 2012, created an entirely new permitting regime for water withdrawals other than public water suppliers.⁷ Major purposes of the law were to “foster responsible [water] conservation practices and economic growth while protecting water bodies and wildlife habitats,” and to implement the state’s water conservation obligations under the Great Lakes-St. Lawrence River Basin Water Resources Compact.⁸ A critical element of the permitting regime,

NYSDEC, Adoption of Water Withdrawal Regulations (Nov. 2012), Assessment of Public Comments (“Nov. 2012 Response to Public Comments”), Response to Frequent Comment #4; *see also* NYS Register, Nov. 28, 2012, at 6.

⁶ See further discussion under point 3.f. below.

⁷ Public water suppliers are also subject to the law, but had already been subject to permitting under the previous version of Article 15, Title 15.

⁸ “Governor Cuomo to Sign Law to Protect New York’s Waters,” press release, August 15, 2011; <http://www.governor.ny.gov/press/08152011LawtoProtectNewYorksWaters>.

essential to both of those purposes, is the requirement that water withdrawal permittees must implement all “environmentally sound and economically feasible water conservation measures.”

The statute defines the phrase “environmentally sound and economically feasible water conservation measures” in broad terms, as measures to reduce water use that “(i) are environmentally sound; (ii) reflect best practices applicable to the water use sector; (iii) are technically feasible and available; (iv) are economically feasible and cost effective based on an analysis that considers direct and avoided economic and environmental costs; and (v) consider the particular facilities and processes involved, taking into account the environmental impact, age of equipment and facilities involved, the processes employed, energy impacts and other appropriate factors.”⁹

DEC’s implementing regulations incorporated this statutory definition,¹⁰ and added that the water conservation measures in a permittee’s water conservation program “must include, but are not limited to: [1] source and customer metering; [2] frequent system water auditing; [3] system leak detection and repair; [4] recycling and reuse; and [5] ability to enforce water restrictions during drought.”¹¹ The regulations do not elaborate further on these measures, but they do provide that the water conservation programs must be included in the permit application, using either a form made available by the DEC or a plan subject to DEC approval.¹²

In turn, DEC’s Water Conservation Program Form for Non-Potable Water Withdrawals (“Form”) lists eleven best management practices (“BMPs”) that fall within the regulation’s five categories:¹³

- Metering:
 - *100% metering of all sources of water withdrawal.*
 - *Source and secondary meters must be tested and calibrated annually.*
- Water system auditing:
 - *At least once each year, a system water audit must be conducted using metered water production and consumption data to determine unaccounted-for water.*
 - *Keep accurate estimates of unmetered water use.*
 - *Quantify all authorized water uses by consumption categories.*
- Leak detection and repair:
 - *Check any underground water distribution systems for leaks each year.*
 - *Fix every detectable leak as soon as possible.*
 - *Have an on-going system rehabilitation program.*

⁹ ECL § 15-1502(9).

¹⁰ 6 NYCRR § 601.2(g).

¹¹ 6 NYCRR § 601.10(f).

¹² *Id.*

¹³ The form is online at http://www.dec.ny.gov/docs/water_pdf/wcpfnon.pdf. In the form, the measures “recycling and reuse” and “enforce water restrictions during drought” are combined into one category: “water reuse, recycling, and drought planning.”

- Reuse, recycling, and drought planning
 - *Reuse or recycle water whenever possible.*
 - *Employ efficient irrigation techniques*
 - *Develop a plan to reduce water use during times of drought.*

The Form’s list of BMPs is a helpful addition to the language of the regulation, but the Form does not explain whether (or under what conditions) each of these specific BMPs is necessary;¹⁴ nor does it explain what would constitute sufficient implementation of each BMP or how each BMP applies to particular water use sectors. (Indeed, the Form does not even inform applicants of their mandatory obligation to implement all water conservation measures that are “environmentally sound and economically feasible.”)

The Form references the Draft Survey as a source for further information on water conservation measures. Various portions of the Draft Survey expand on several of the measures and BMPs provided in the regulation and the conservation form.¹⁵ But the Draft Survey, like the regulations and the Form, fails to provide a roadmap for permit applicants or permit-writers to determine which BMPs to include in a water conservation program. Most importantly:

- The Draft Survey is not organized in a manner that explicitly links particular water conservation strategies to the five measures required by DEC regulations, nor to the eleven BMPs identified on the DEC water conservation program form.
- The Draft Survey does not explain which specific BMPs DEC expects will be necessary – either in general, or for specific categories of water users -- to comply with the five mandatory measures in the regulation.

In sum, as a practical matter, the Draft Survey offers no “uniform basis for compliance and enforcement across the state,” as is DEC’s stated goal for guidance documents.¹⁶

Effective guidance would explain how DEC will review the adequacy of “water conservation programs” proposed in water withdrawal permit applications and provide a roadmap for how applicants can meet the agency’s expectations. The most effective way to do this is to:

¹⁴ The form (on p. 6) states that the listed BMPs “represent DEC water conservation policy objectives and should be incorporated into your program development” (emphasis added).

¹⁵ As discussed further below, the Draft Survey also identifies certain additional categories of water conservation measures that are not specified in the regulations or the Water Conservation Form.

¹⁶ DEC explains on its website that “[g]uidance documents provide interpretations of rules and regulations. Most guidance documents offer details about how to comply, helping both the regulated community and DEC staff work toward compliance. DEC’s Guidance provides a uniform basis for compliance and enforcement across the state. DEC, “Guidance and Policy Documents,” <http://www.dec.ny.gov/regulations/397.html> (visited 11/18/13). Similarly, ECL § 3-0301(2)(z) authorizes DEC to “[i]ssue and amend guidance memoranda and similar documents of general applicability which are to be relied upon by department personnel for implementation of this chapter, and rules and regulations promulgated pursuant thereto, and for guidance to the general public in complying with the requirements of [the ECL].”

- (1) for specified categories of non-potable water users, clearly identify the specific BMPs that DEC will presume are necessary components of a water conservation plan, unless demonstrated otherwise by an applicant;
- (2) provide a methodology for determining whether one of the presumptively necessary BMPs is not, in fact, “environmentally sound and economically feasible” in the case of a particular water withdrawer;
- (3) identify additional BMPs (according to water use sector) which, while not presumptively required, DEC expects applicants to analyze to determine whether such BMPs are “environmentally sound and economically feasible” in its own particular case; and
- (4) identify the key elements of each BMP along with a “how to” guide for implementing each one.

The Draft Survey provides information relevant only to the fourth point. But the first three items are even more critical to provide a framework for implementing DEC’s water withdrawal permitting regulations.

Wisconsin’s water withdrawal permitting regulations provide a useful model for our recommended approach.¹⁷ The Wisconsin Department of Natural Resources identified a set of conservation measures deemed to be “environmentally sound and economically feasible,” based on a consensus among a wide number of interests and developed through a broad-based advisory committee process. Wisconsin’s measures are tailored to specific water use sectors, and are increasingly stringent depending on the amount of water withdrawn.

For each of seven water use sectors and three “tiers” (*i.e.*, threshold amounts, in gallons) of withdrawals, Wisconsin has identified specific mandatory minimum water conservation measures. For the two highest tiers of water users (including withdrawals averaging at least 1,000,000 gallons per day for any 30 consecutive days), additional measures are presumed to be necessary, unless a permittee either demonstrates (according to a defined methodology) that one or more of those measures are not “environmentally sound and economically feasible,” or selects any alternative set of measures that it demonstrates will reduce water usage by at least 10%. For the highest tier of water users (including diversions from the Great Lakes Basin averaging more than 2,000,000 per day in any 30-day period, or resulting in a “water loss”¹⁸ from any basin of at least that same amount), permittees must also implement any further water conservation measures that

¹⁷ Wis. Admin. Code ch. NR 852, available at http://docs.legis.wisconsin.gov/code/admin_code/nr/852.pdf.

¹⁸ The term “water loss” is defined at Wisconsin Statutes Section 281.346(1) to mean “the amount of water that is withheld from or not returned to the basin from which it is withdrawn as a result of a diversion or consumptive use or both.”

it determines, based on an analysis to be submitted with its permit application, to be environmentally sound and economically feasible.¹⁹

DEC should develop a similar “tiered” set of water conservation measures, which are expected of various categories of users. Although this would ideally be accomplished through a binding agency regulation, DEC could achieve a similar result by presenting this approach in a “guidance” document that describes DEC’s expectations of how it will review permit applications for compliance with its existing regulations.

Finally, we also request that DEC provide guidance regarding the nature of the “implementation and enforcement procedures” that must be included in a water conservation program and regarding how an applicant is expected to describe the “effectiveness to date [of its water conservation plan] and any planned modifications for the future.” These are two of the required elements of water conservation programs under ECL § 15-1503.1(f), but DEC’s regulations did not provide any information on how to comply with these requirements. Instead, DEC stated, upon issuing the regulations, that additional information on these topics would be forthcoming in the planned “non-potable water [conservation] guide.”²⁰ The Draft Survey does not fulfill this promise. To ensure proper implementation of ECL § 15-1503.1(f), DEC should revise the Draft Survey to include clear guidance on these matters.

3. Recommendations Concerning Specific BMPs

In addition to the over-arching recommendations set forth above, we also provide the following recommendations to improve the Draft Survey’s discussions of specific water conservation measures and/or water use sectors.

a. Power plants

Although the Draft Survey’s “abstract” states that the document includes water conservation measures for the power-generation sector, such information actually appears to be missing from the document. Since power plant water use for thermoelectric cooling comprises 80 % of New York’s total water withdrawals and 75% of total fresh water withdrawals,²¹ and power plants comprise all of the largest non-public water supply withdrawers subject to permitting;²² it is essential that DEC provide clear water conservation expectations that address this sector.

¹⁹ The withdrawal volumes associated with the three “tiers” are explained in Correspondence Memorandum, State of Wisconsin, Recommendation for adoption of proposed Wis. Adm. Code Chapter NR 852 (July 28, 2010), available at: http://megwater.org/wordpress/wp-content/uploads/Green_Sheet_NR_852_water_conservation_and_water_use_efficien.pdf.

¹⁹ Wis. Adm. Code ch. NR 852.04.

²⁰ See Nov. 2012 Response to Comments (#G-22.9), which simply cross-referenced the Response to Frequent Comment #4, providing that additional information would be forthcoming in the planned “non-potable water [conservation] guide.” .

²¹ See USGS, *Estimated Use of Water in the United States in 2005*, available at <http://pubs.usgs.gov/circ/1344/>.

²² See <http://nywaterlaw.com/blog/2013/04/0407nywaterregs.html>.

In the context of regulating cooling water intakes under the Clean Water Act and the State Pollutant Discharge Elimination System (SPDES) permit program, DEC has been a leader in announcing a policy (Commissioner’s Policy 52) that closed-cycle cooling is deemed to represent the “Best Technology Available” (“BTA”). When DEC adopted its regulations for the water withdrawal permitting program, the agency stated that, for power plants, review of water withdrawal permits and SPDES permits would be combined, and that applicants would be able to submit a single analysis demonstrating compliance with the water withdrawal permitting standards and with the BTA standards under 6 NYCRR 704.5.²³ DEC further stated that the non-potable water conservation form would “likely” include a space to demonstrate compliance with the BTA standard. The existing form, however, does not invite applicants to do so.²⁴

DEC should revise the Draft Survey, and the Water Conservation Program Form for non-potable water users, to explain that power plants’ water conservation programs are expected to comply with Commissioner’s Policy 52.

Further, DEC should revise the Draft Survey and the Water Conservation Program Form to require power plants to address process water as well as cooling water. The revised Draft Survey should include a discussion of dry handling of fly ash and bottom ash and the water conserving benefits of such systems.

Dry handling of fly ash is a well-established practice within the industry, which is already in use at most coal-fired plants. Nonetheless, because this practice has not been universally adopted, fly ash transport is one of the largest uses of process water at coal-fired power plants; EPA estimates that the average fly ash transport water flow rate at power plants is 2.4MGD, and that the steam electric industry discharged a total of 81.81 billion gallons of fly ash transport water to surface water nationally in 2009, or about 224 MGD. Bottom ash transport water, though typically lower in volume than fly ash transport water, is still one of the larger volume flows for the nation’s fleet of steam electric power plants as a whole. EPA estimates that, in 2009, the total amount of bottom ash transport water discharged was 157 billion gallons per year, or about 430 MGD. Although many coal-fired and petroleum coke-fired plants operate dry bottom ash handling systems, an estimated 67 percent of all existing plants (79 percent of coal- and petroleum coke-fired generating units) wet sluice all or part of their bottom ash. In addition to reductions in water use, dry ash handling methods may have additional benefits for power plants, such as decreasing O&M costs and bringing in additional revenue, which should be considered when evaluating the economic feasibility of these practices.²⁵

²³ Dec. 2012 Response to Comments, Response #150; *see also id.*, Response to Frequent Comment # 8.

²⁴ Dec. 2012 Response to Comments, Response #11.

²⁵ For further discussion of dry handling of fly ash and bottom ash and the water conserving (and other) benefits of such systems, and the sources of the underlying data referenced here, see Memo dated 9/20/13 from NRDC to EPA Docket ID No. EPA-HQ-OW-2009-0819-0068, Re: “Steam Electric Effluent Guidelines: Associated Water Savings and Benefits to Reduced Surface Water Withdrawals,” available at http://docs.nrdc.org/energy/ene_13100102.asp.

b. Commercial, industrial, and institutional (“C/I/I”) (pp. 6-18, 24-30)

We recommend that DEC expand upon the contents of the Draft Survey by drawing from the California Department of Water Resource’s draft CII Taskforce Report,²⁶ which describes water conservation BMPs for individual industries in much greater detail than the Draft Survey. Important issues that are addressed in the California report and missing from the Draft Survey include:

- How to determine whether a BMP is cost-effective.
- Data collection, data reporting, metrics and benchmarking. (This information could bolster the discussion in the section of the Draft Survey titled, “Methods of Documenting Water Use and Conservation Methods.”)

c. Landscape irrigation (pp. 13-14)

We recommend the following revisions to this section. Underlined text indicates suggested additions, and struck-through text indicates suggested deletions:

- Water thoroughly and less often, instead of lightly and more frequently, ~~in areas where the soil type is acceptable for this type of water schedule.~~ This water schedule encourages deep root growth.
[REASON: The 3rd bullet point on p. 13 points out the need to design the landscape surrounding a facility to minimize the need for outdoor water use. An effective design would account for soil types, making this phrase unnecessary.]
- Avoid watering on windy ~~or rainy~~ days and do not water on rainy days. Install and maintain wetness sensors to prevent unnecessary watering by automated sprinkler systems.
- Time watering, ~~when possible,~~ to occur in the early morning or evening when evaporation ~~and transpiration are~~ is lowest and windy conditions less likely.
- Have an inspection and maintenance plan for any irrigation system and document that it is being followed. Have a full audit of the irrigation system done every 3 years by a qualified irrigation auditor, such as a professional certified by a WaterSense labeled program. Review all landscape service and maintenance agreements periodically to see if they meet efficiency and performance standards. ~~Consider installing a separate meter to measure the amount of water applied to the landscape which may help to more quickly identify leaks.~~
- ~~Avoid~~ Ensure zero runoff and make sure sprinklers cover just the lawn or garden, not sidewalks, driveways, or gutters. Do not overwater.

²⁶ The report is available at http://www.dwr.water.ca.gov/wateruseefficiency/sb7/docs/Volume_II-CII_TF_Report_9-25-2013_final_draft.pdf.

- Install a separate meter to measure the amount of water applied to the landscape and more quickly identify leaks.

[REASON: Outdoor water use is often the largest single end use of water. According to USEPA's WaterSense, as much as 50 percent of commercial and residential irrigation water use goes to waste due to evaporation, wind, improper system design, or overwatering. Without metering both indoor and outdoor water use, that use and potential waste cannot be identified.]

Additionally, we note that the text does not explain whether the photograph on page 14 is meant to illustrate desirable or undesirable irrigation practices. The photo appears to represent a potentially wasteful irrigation system (e.g., the photo shows water running onto the pavement; watering is taking place during bright daylight hours when significant evaporation is likely). If the intent is to illustrate what not to do, this should be stated. Preferably, we recommend the use of a photo or other graphic illustrating recommended practices, or pairs of images that contrast recommended and inefficient practices.

d. Agriculture (pp. 19-22)

The Draft Survey identifies several important actions to improve agricultural water use efficiency and conservation. However, it omits any discussion of the other benefits of improved efficiency, such as reduced agricultural runoff and improved water quality, reduced use of fertilizer and other inputs, reduced energy use (from groundwater pumping), and/or increased crop yields.²⁷ These co-benefits are critical to quantify in assessing the economic feasibility of these conservation measures. We recommend adding text identifying these and other co-benefits from improved agricultural water use efficiency and requiring their inclusion in calculating whether measures are economically feasible.

The Draft Manual appropriately identifies water audits as an initial action to determine the efficiency of the existing irrigation system and identify actions to improve on farm efficiency. However, while it recommends on-farm meters to measure water use, measurement of water use at the field level is critical to be able to determine water use efficiency and to determine the economic feasibility of additional measures. Accurate measurement of water deliveries at the field level should be a foundational requirement; this approach appears to be consistent with the regulatory requirement for source and customer metering as a required element of the conservation program (6 NYCRR §601.10(f)). Accurate measurement and on-demand water delivery is also very important to be able to improve irrigation efficiency, adopt irrigation scheduling, and implement many of the identified conservation measures.

²⁷ See, e.g., Gleick, Peter, Christian Smith, Juliet, and Cooley, Heather, 2011. *Water Use Efficiency and productivity: rethinking the basin approach*. 36 *Water International* 7 (784-798), available online at: <http://www.centralvalleybusinesstimes.com/links/water-use-efficiency-and-productivity-rethinking-the-basin-approach.pdf>.

Many of the recommended actions focus on improving irrigation system efficiency (including installing high efficiency irrigation systems, leveling fields, and lining canals to reduce water losses). Investments in more efficient irrigation methods have been shown to increase yields and increase productivity (“crop per drop”), and despite the initial capital costs, the initial investment often pays for itself in a short period of time as a result of the reduced inputs and increased outputs.²⁸ Lining supply ditches and canals or fully enclosing water conveyance systems can reduce water losses to groundwater (which can reduce energy costs from groundwater pumping or reduce the amount of surface water diversions). We also recommend that the Draft Survey include mention of tailwater capture and recovery systems as a water conservation tool.

Likewise, use of soil moisture sensors and/or irrigation scheduling has been shown to substantially reduce water use and increase yields. For instance, a survey by the Department of Agriculture and Resource Economics at the University of California, Berkeley found that the use of the California Irrigation Management Information System (CIMIS, an integrated irrigation scheduling system that uses weather stations across the state) resulted on average in an 8% increase in yields and 13% reduction in water use.²⁹ Similarly, regulated deficit irrigation (RDI) also has been shown to result in increased yields and reduced water use for certain crops, including orchard crops, although results vary significantly depending on the crop and RDI may be inappropriate for some crops.³⁰ The Draft Survey should encourage evaluation of regulated deficit irrigation and should provide further information and resources about irrigation scheduling.

Conservation tillage can also significantly reduce water use and improve yields, and we strongly recommend inclusion of these practices in the final report.³¹ We are pleased that the report also encourages the use of recycled water. Recycled water (and conjunctive use of surface

²⁸ See, e.g., Sanden, B., K. Klonsky, D. Putnam, L. Schwankl and K. Bali. 2011. Comparing Costs and Efficiencies of Different Alfalfa Irrigation Systems. In: Proceedings, 2011 Western Alfalfa & Forage Conference, 11-13 December, Las Vegas, Nevada; Schwankl, L., T. Prichard, B. Hanson, and I. Wellman. 1999. Costs of pressurized orchard irrigation vary with system design. *California Agriculture* 53(5):14-20; Granados, M.R., R.B. Thompson, M.D. Fernández, C. Martínez-Gaitán, and M. Gallardo. 2013. Prescriptive–corrective nitrogen and irrigation management of fertigated and drip-irrigated vegetable crops using modeling and monitoring approaches. *Agricultural Water Management* 119: 121-134.

²⁹ See Parker, D., D. Cohen-Vogel, D. Osgood, and D. Zilberman. 2000. Publicly funded weather database benefits users statewide. *California Agriculture* 54(3):21-25.

³⁰ See Chaves, M.M., T.P. Santos, C.R. Souza, M.F. Ortuno, M.L. Rodrigues, C.M. Lopes, J.P. Maroco, and J.S. Pereira. 2007. Deficit irrigation in grapevine improves water-use efficiency while controlling vigour and production quality. *Annals of Applied Biology* 150: 237-252; Fereres, E. and M.A. Soriano. 2007. Deficit irrigation for reducing agricultural water use. *Journal of Experimental Botany* 58: 147-159; Stewart, W., A. Fulton, W. Krueger, B. Lampinen, and K. Shackel. 2011. Regulated deficit irrigation reduces water use of almonds without affecting yield. *California Agriculture* 65(2):90-95.

³¹ See NRDC, *Soil Matters: How the Federal Crop Insurance Program should be reformed to encourage low-risk farming methods with high-reward environmental outcomes* (2013), available at <http://www.nrdc.org/water/soil-matters/>.

water and groundwater) can help reduce diversions from surface water sources, which can have substantial environmental benefits.

Ultimately, while the Draft Survey identifies several important measures, it provides very little in terms of practical resources, and it does not provide any guidance in how to assess whether implementation of these measures are economically feasible. We strongly recommend that DEC provide guidance on how to calculate economic feasibility and provide practical resources for agricultural users on how to assess and implement these identified measures.

e. Hydraulic Fracturing (p. 29)

The Draft Survey contains only one recommendation specific to hydraulic fracturing, which is to “[r]ecycle water used in well hydraulic fracturing operations.”

NRDC generally supports the use of recycled water to the maximum possible extent in hydraulic fracturing operations, *provided that* the environmental benefits of doing so are not outweighed by the costs associated with the energy intensity of technologies used to prepare wastewater for reuse and/or management of concentrated residual wastes.³²

Because of the large amounts of water used, and wastewater generated, in the hydraulic fracturing process (and related natural gas development activities), numerous additional techniques should be employed to minimize water use and wastewater generation.³³ We strongly encourage DEC to review and incorporate the measures set forth in these publications in the final guidance.

We note that, even if all of the above hydraulic fracturing-related recommendations are incorporated into DEC’s final water withdrawal guidance for on-going low-volume hydraulic fracturing, NRDC continues to believe that no permits for high-volume hydraulic fracturing should be issued in New York State, at least until the State has properly completed its on-going environmental review and regulatory review processes, including preparation of a comprehensive health impact assessment.

f. Water Reuse, Reclaimed Wastewater, and Alternate Sources of Water (p. 30)

We agree with the Draft Survey’s statement that “water reuse, reclaimed wastewater, and alternate sources of water” can be valuable sources of nonpotable water. In addition to the Draft Survey’s general discussion of this topic (p. 30), however, DEC should strengthen the recommendations made under each “water use activity” to more fully reflect the importance of

³² See NRDC, *In Fracking’s Wake: New Rules are Needed to Protect Our Health and Environment from Contaminated Wastewater* [“*In Fracking’s Wake*”], 2012, available at <http://www.nrdc.org/energy/files/fracking-wastewater-fullreport.pdf>, at 88-90; see also *id.* at 20-26, 32-33, Chap. 2, 61.

³³ See *In Fracking’s Wake* at 16-17; see also American Petroleum Institute, “Water Management Associated with Hydraulic Fracturing,” June 2010, available at http://www.api.org/~media/Files/Policy/Exploration/HF2_e1.pdf.

water reuse, use of reclaimed wastewater and use of alternate sources of water, to comprehensively address water conservation and efficiency.

We recommend the following revisions to specific sections of the Draft Survey. Underlined text indicates suggested additions, and struck-through text indicates suggested deletions:

Indoor Domestic Use (p. 5):

- Understand where water is being used and why as a critical first step in water conservation (for example, perform a water audit). For each water-using activity, determine the quantity and purpose of water being used. Determine water sources, how water is transported throughout the facility, age of each fixture and/or fitting and frequency of use. Assess water-conservation methods for each activity, including alternate sources of water and possible reuses, including the use of graywater, captured rainwater or other alternate water sources for toilet-flushing and laundries.

Restrooms and Shower Facilities (p. 6):

- Understand where water is being used and why as a critical first step in water conservation (for example, perform a water audit). For each water-using activity, determine the quantity and purpose of water being used. Determine water sources, how water is transported throughout the facility, age of each fixture and/or fitting and frequency of use. Assess water-conservation methods for each activity, including alternate sources of water and possible reuses, including the use of graywater, captured rainwater or other alternate water sources for toilet-flushing.
- ~~Consider retrofitting~~ or replacing older plumbing devices with new water-efficient models, such as WaterSense-labeled models.

Building Maintenance and Exterior Areas (p. 11):

- Understand where water is being used and why as a critical first step in water conservation (for example, perform a water audit). For each water-using activity, determine the quantity and purpose of water being used. Determine water sources, how water is transported throughout the facility, and frequency of use. Assess water-conservation methods for each activity, including alternate sources of water and possible reuses, including the use of graywater, captured rainwater or other alternate water sources for landscape irrigation and vehicle washing.
- Install separate meters for outdoor water use.
[REASON: Water utilities estimate unmetered water consumption is reduced 15 to 30 percent when metering is implemented. According to USEPA's WaterSense, as much as 50 percent of commercial and residential irrigation water use goes to waste due to evaporation, wind, improper system design, or overwatering. Without metering outdoor uses, that use and potential waste cannot be identified.]

Exterior Areas (p. 12):

- Understand where water is being used and why as a critical first step in water conservation (for example, perform a water audit). For each water-using activity, determine the

quantity and purpose of water being used. Determine water sources, how water is transported throughout the facility, and frequency of use. Assess water-conservation methods for each activity, including alternate sources of water and possible reuses, including the use of graywater or other alternate water sources for vehicle washing.

Landscape Irrigation (p. 13-14):

- Consider the use of reclaimed wastewater, captured rainwater or other alternate water sources for irrigation.
- Install rain barrels or cisterns to capture and distribute water for irrigation.
- Recirculate water or use alternate water sources, including reclaimed wastewater when local regulations allow, in water features such as ponds, waterfalls, and decorative fountains. Reduce evaporative losses by shutting off these water features when possible. Check the water recirculation systems at least annually for leaks and other damage.

Some of these recommended additions concern the use of green infrastructure for water conservation. Accordingly, we also recommend a new sub-section be added to the discussion of alternative water sources on p. 30, which would read as follows:

Using Green Infrastructure as a Water Conservation Strategy

Green infrastructure is the use of natural and some built systems that capture rainwater, storing it for use or letting it filter back into the ground, replenishing vegetation and groundwater supplies. Examples of green infrastructure include green roofs, street trees, increased green space, rain barrels, rain gardens and permeable pavement. These solutions have the added benefits of beautifying neighborhoods, cooling and cleansing the air, reducing asthma and heat-related illnesses, lowering heating and cooling energy costs, boosting economies, and supporting American jobs. (See Noah Garrison and Karen Hobbs, “Rooftops to Rivers II: Green strategies for controlling stormwater and combined sewer overflows,” Natural Resources Defense Council, November 2011, p. 5: <http://www.nrdc.org/water/pollution/rooftopsII/files/rooftopstoriversII.pdf>.)

Water collected in rainwater harvesting systems, such as cisterns and rain barrels, can be used for outdoor irrigation and some indoor uses. (See “Why Green Infrastructure?” U.S. Environmental Protection Agency: http://water.epa.gov/infrastructure/greeninfrastructure/gi_why.cfm.) Drought-tolerant landscaping also helps capture and conserve water.

Specific green infrastructure strategies are incorporated, as appropriate, into each section.

EXAMPLE:

War Memorial Arena in Onondaga County: installed a 15,000 gallon cistern system that allows for the capture, filtration and re-use of stormwater for many

reuse purposes, including the use of recycled stormwater for a hockey rink. More information available here: <http://savetherain.us/war-memorial-water-re-use-system/>

Finally, to enable implementation of the graywater and reclaimed wastewater practices recommended in the Draft survey, we urge DEC to develop long-overdue regulatory standards for those practices. State law enacted in 2005 required DEC to establish, by April 2008, rules, regulations, and standards for the reuse and disposal of reclaimed wastewater and/or graywater (NY ECL § 15-0605). The law provides that these rules must specify the permitted uses of reclaimed wastewater and graywater (including, at a minimum, industrial cooling, commercial and industrial landscaping, park and golf course irrigation, groundwater recharge, surface water supply augmentation, wetland creation and augmentation, and non-food agricultural crop and lawn irrigation); required levels of water quality and treatment for each use; and operational requirements. Although DEC completed a feasibility report on this topic in 2010, it has not yet issued regulatory standards.

Graywater and reclaimed wastewater reuse are important for a number of reasons, including many cited by the 2010 DEC report, such as the potential to reduce energy use, increase instream flow and aquifer and groundwater recharge. The development of these technologies is also important as an economic development tool, attracting emerging industries, often in states with plumbing codes that recognize the importance of these systems and identify a clear path to their use.

g. Water conservation plans (p.32)

The essence of a water conservation plan is the inventory and evaluation of conservation options. The Conservation Plan section of the Draft Survey incongruously introduces new measures not discussed elsewhere, *e.g.*, “making the public aware that only cold water is being used in restroom sinks,” while failing to provide any guidance or process for determining whether a conservation measure under consideration is economically feasible. As noted above, this is a major failing of the current draft, and this section should be substantially rewritten in any revised version of the document.

h. Additional water use sectors

Water withdrawal reporting data posted on DEC’s website indicates the following categories of users, in addition to public water suppliers, are currently withdrawing water in New York State in amounts that trigger DEC’s new permitting requirements: agricultural, bottled/bulk water, commercial, industrial, institutional, mine dewatering, oil/gas production, other, power – fossil fuel, recreational – golf course, recreational – other, an recreational – snow making. Some, but not all, of these sectors are specifically addressed in the Draft Survey. In a revised guidance document, DEC should be sure to identify specific water conservation measures for each of these water use sectors.

i. Guidance for public water suppliers

We recognize that the purpose of the Draft Survey is to address water users other than public water suppliers. However, we note that a large portion of the Draft Survey addresses water uses by commercial and institutional facilities, which will most typically be using public water supplies and therefore will not be applying for their own water withdrawal permits. DEC should utilize this valuable information as part of an update its 1989 Water Conservation Manual for public water suppliers. We call on DEC, as we have previously (e.g., in our Feb. 6, 2012 comments on DEC’s proposed water withdrawal regulations), to update that Manual.

NRDC’s June 2011 report, “*Protecting a Shared Future: Assessing and Advancing the Sustainable Management of the Great Lakes through Water Conservation and Efficiency*,”³⁴ identified 5 priority actions that public water suppliers should undertake to fully implement the water conservation and efficiency requirements of the Great Lakes Compact while saving utilities and water users money. Some of these are not included in the current version of the 1989 Water Conservation Manual. Aspects of the 1989 Manual in need of updating include:

- The discussion of “Leak Detection and Repair” includes costs for equipment that is more than 20 years old.
- Table 5, estimating leak losses under different pressures, should be updated; it doesn’t reflect latest technology. For example, one of the recommendations in NRDC’s June 2011 report is that utilities should use the free AWWA software for water loss audits.
- The manual does not address the use of green infrastructure, which has elsewhere been adopted as state policy.
- Substantial technological advances in graywater, water reuse, plumbing efficiency, over the last two decades, are not reflected.

Further, much of the information in the Draft Survey, concerning commercial, industrial, and institutional (“C/I/I”) users of water, can be adapted for purposes of an updated Water Conservation Manual for public water suppliers. In particular, an updated Manual should describe steps that water utilities can take to encourage their C/I/I customers to adopt the BMPs identified in the Draft Survey.

* * * * *

We appreciate DEC’s consideration of these comments and would welcome the opportunity to discuss them further with you. Several NRDC staff members with technical expertise in one or more of the above topics contributed to this comment letter, and would be

³⁴ The report is available here: <http://www.nrdc.org/water/greatlakescompact.asp> .

available to provide additional information or otherwise assist DEC with improvements to the Draft Survey. Please contact Larry Levine at 212-727-4548 or llevine@nrdc.org with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Larry Levine", written over a light gray rectangular background.

Lawrence Levine
Senior Attorney