Regulating for the Public Health: Perchlorate Regulation Under the Safe Drinking Water Act Exceeds Statutory Authority

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Abstract

This paper recommends rethinking the statutory framework of the Safe Drinking Water Act (SDWA) to provide a more robust rubric, to include a scientific and objective focus, for proper regulation. The SDWA is evaluated through the lens of upcoming perchlorate regulation due in February 2013.

The United States Environmental Protection Agency (EPA) regulates acceptable contaminant levels and decontamination processes for all public water systems, pursuant to statutory authority granted by the SDWA. Where the policy at work is admirable, the execution falls short.

Perchlorate occurs naturally, but also as a by-product to rocket fuel, firework, and other explosive constructions. Scientific studies confirm that perchlorate inhibits iodide uptake in the thyroid – related to neurodevelopment in fetuses and infants, and metabolic regulation in adults – but differ on what constitutes safe levels of exposure.

Little scholarship or case law can be found relating to the SDWA and the literature becomes more scant when focused on perchlorate. This paper compiles the case law and scholarship on the topic and addresses two key issues by first analyzing the debatable constitutionality of the SDWA, and second, analyzing the SDWA to determine whether the EPA can regulate perchlorate in compliance with the statute.

Most challenges to the SDWA rest on the assertion that public water systems do not participate in interstate commerce and thus cannot be reached by the Commerce Clause authority of Article I. This argument historically fails in federal courts. Though the constitutionality of the SDWA remains in question, perchlorate regulation is improper because it does not meet the statutory mandates. Instead, such regulation is an example of overregulation and extra-statutory exercises of authority by the EPA in an effort to remain relevant and expand the sphere of potential future regulation.
I. INTRODUCTION

More than 150,000 public water systems serve more than 300 million customers in the United States.1 Approximately eighty percent of these systems are considered “very small” and

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serve five hundred or fewer customers. All of them are subject to federal regulation under the Safe Drinking Water Act (SDWA). The cost of complying with a new water regulation usually involves installation of new technology, training of staff, monitoring contaminant levels, and assorted treatment costs. These costs remain relatively constant regardless of a water system’s size.

In 2001, the United States Environmental Protection Agency (EPA) adopted a new standard for arsenic in drinking water at ten parts per billion, thereby replacing the old standard

<table>
<thead>
<tr>
<th># of systems</th>
<th># of systems</th>
<th>Population served.</th>
<th>% of systems</th>
<th>% of population</th>
</tr>
</thead>
<tbody>
<tr>
<td>125,12</td>
<td>14,163</td>
<td>107,658,000</td>
<td>81.5%</td>
<td>4.51%</td>
</tr>
<tr>
<td>19,126</td>
<td>25,109</td>
<td>29,574,000</td>
<td>12.46%</td>
<td>8.0%</td>
</tr>
<tr>
<td>5,090</td>
<td>29,743</td>
<td>660,000</td>
<td>3.32%</td>
<td>9.42%</td>
</tr>
<tr>
<td>3,775</td>
<td>107,658</td>
<td>137,380,000</td>
<td>2.45%</td>
<td>34.3%</td>
</tr>
<tr>
<td>413</td>
<td>413</td>
<td>137,380,000</td>
<td>0.27%</td>
<td>43.77%</td>
</tr>
<tr>
<td>153,530</td>
<td>313,886</td>
<td>153,530,000</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

2 Id. For a full breakout of system size and population served: Table 1 – System Size by Population Served


5 See, e.g., WATER SUPPLY & WATER RES. DIV., EPA, EPA/600/R-11/090, COSTS OF ARSENIC REMOVAL TECHNOLOGIES FOR SMALL WATER SYSTEMS: U.S. EPA ARSENIC REMOVAL TECHNOLOGY DEMONSTRATION PROGRAM 69 (2011) (showing that the cost of a removal system depends on the rate of flow of the water, not on the size of the system).

6 Environmental and administrative law can be rife with acronyms. To avoid confusion, I have included a glossary of the acronyms used in this paper. See infra Appendix 1: Glossary for a definition of all the acronyms used herein.
of fifty parts per billion. Regulation compliance was estimated to cost $4.5 billion nationwide. While that number is staggering in and of itself, the most interesting numbers come when evaluating the annual cost per household of regulation compliance, as determined by system size: $326.82 for a system serving 100 or fewer customers, as opposed to $0.86 for a system serving a million or more customers.

The EPA will propose a new regulation for perchlorate in February 2013. Promulgation of perchlorate regulation provides a useful lens to view the Safe Drinking Water Act, reassess the bounds of federalism, and reevaluate the use of science in the regulatory process. Although many

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8 Russell et al., supra note 4, at 61.
9 National Primary Drinking Water Regulations, Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring, 66 Fed. Reg. 6976, 7011 (Jan. 22, 2001). EPA provided a household cost analysis based on the size of the water system and alternative regulatory levels. That breakdown was:

<table>
<thead>
<tr>
<th>System size</th>
<th>3 Mµg/L</th>
<th>5 Mµg/L</th>
<th>10 Mµg/L</th>
<th>20 Mµg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100</td>
<td>317.00</td>
<td>318.28</td>
<td>328.62</td>
<td>351.15</td>
</tr>
<tr>
<td>101-500</td>
<td>166.91</td>
<td>164.02</td>
<td>162.50</td>
<td>166.72</td>
</tr>
<tr>
<td>501-1,000</td>
<td>74.81</td>
<td>73.11</td>
<td>70.72</td>
<td>68.24</td>
</tr>
<tr>
<td>1,001-3,300</td>
<td>63.76</td>
<td>61.94</td>
<td>58.24</td>
<td>54.36</td>
</tr>
<tr>
<td>3,301-10,000</td>
<td>42.84</td>
<td>40.18</td>
<td>37.71</td>
<td>34.63</td>
</tr>
<tr>
<td>10,001-50,000</td>
<td>38.40</td>
<td>36.07</td>
<td>32.37</td>
<td>29.05</td>
</tr>
<tr>
<td>50,001-100,000</td>
<td>31.63</td>
<td>29.45</td>
<td>24.81</td>
<td>22.63</td>
</tr>
<tr>
<td>100,001-1,000,000</td>
<td>25.29</td>
<td>23.34</td>
<td>20.52</td>
<td>19.26</td>
</tr>
<tr>
<td>&gt;1,000,000</td>
<td>7.41</td>
<td>2.79</td>
<td>0.86</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Id.

Further, issues relating to the regulation of navigable waters (surface waters) under the Commerce Clause are beyond the scope of this Comment. For case law related to surface water regulation and the Clean Water Act, see Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, 531 U.S. 159, 171–72 (2001), declining to extend regulatory authority under the Clean Water Act to purely intrastate waters that did not fit the definition of “navigable waters.”


This Comment addresses two main issues by first analyzing the debatable constitutionality of the SDWA and the powers under which it is enacted, and second, analyzing the SDWA to determine whether the EPA can regulate perchlorate in compliance with the statute. Part II.A begins with an explanation of the SDWA and how the EPA enacts regulation pursuant to that authority. The Overview continues with a discussion of perchlorate regulation. Part II.C explores the constitutional issues surrounding the SDWA. Section II concludes with a discussion of the limited case law and scholarship related to the SDWA and regulation thereunder.

Section III begins by showing that the SDWA, though arguably enacted under Commerce Clause authority, is subject to the bounds of federalism expressed in the Tenth Amendment and therefore is an unconstitutional grant of authority to the EPA. Part III.B shows that even if the SDWA were constitutional, the proposed perchlorate regulation does not conform to the statutory mandate and is beyond the pale of the EPA’s authority. Finally, Part III.C addresses the legitimate public policy concerns over the public health and the role of federal regulation in

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12 See infra Part II.A.1 for a discussion of the SDWA requirements for regulation and Part II.A.2 for a discussion of the process for promulgating SDWA regulation.
13 See infra Part II.B for a discussion of the positive and negative effects on human health of perchlorate exposure, where and how frequently perchlorate occurs, and the history of perchlorate regulation to this point.
14 See infra Part II.C for a discussion of the constitutional authority exercised when enacting the SDWA and the limits of that authority as cabined by the federalist principles codified in the Tenth Amendment.
15 See infra Part II.D for a discussion of Nebraska v. EPA, 331 F.3d 995 (D.C. Cir. 2003), the leading case regarding relevant issues with the SDWA, and an elaboration of the most common challenges to SDWA regulation.
16 See infra Part III.A for a discussion of why the SDWA is not properly enacted under Commerce Clause authority and violates the Tenth Amendment.
17 See infra Part III.B for a discussion of why the proposed perchlorate regulations do not conform to the statutory requirements of the SDWA and exceed the EPA’s authority.
promoting the public health. In order to reconcile the policy issues raised by the SDWA and the constitutional limitations thereon, the statute should be revised to correct issues of vagueness and arbitrariness. Section IV provides a brief summation and conclusion.

II. OVERVIEW

As described below, federal regulation of public water systems occurs under the SDWA. The regulatory process can be a long one, but it begins with the EPA Administrator’s determination that a contaminant meets the statutory requirements for regulation. The SDWA sets out three requirements for contaminant regulation. The three requirements are somewhat amorphous and spawn most of the public comment related to possible regulation. Perchlorate, a goitrogenic contaminant, will be the subject of a proposed new federal regulation due in February 2013. Regulatory history surrounding perchlorate shows a new and different working definition for two of the statutory requirements. This change in definition allows for argument over what constitutes an “adverse health effect” or “sufficient frequency of occurrence.”

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18 See infra Part III.C for a discussion of why the SDWA, though bad law, makes for good policy and how it should be revised.
20 See id. § 300g-1(b)(1)(A) (requiring the Administrator to determine that a contaminant meets the requirements before promulgating regulation).
21 Id. §§ 300g-1(b)(1)(A)(i)–(iii). See infra Part II.A.1 for a discussion of the three requirements for proper regulation under the SDWA.
22 Public comments on Agency action and proposals can be viewed at www.regulations.gov. The Preliminary Regulatory Determination on Perchlorate has a docket ID number of EPA-HQ-OW-2008-0692. The docket includes 2287 public comments, almost entirely centered on health effects and occurrence.
23 Goitrogens are contaminants that tend to produce goiter and related thyroid disorders. 6 Oxford English Dictionary 652 (J.A. Simpson & E.S.C. Weiner eds., 2d ed. 1989).
25 See id. (referring to iodide uptake inhibition as the health event triggering regulation); contra Drinking Water: Preliminary Regulatory Determination on Perchlorate, 73 Fed. Reg. 60,262, 60,266 (Oct. 10, 2008) (explaining that iodide uptake inhibition “although not adverse, is
Scholarship and authorities treating the SDWA are rare, and none of them have addressed the potential legal implications of perchlorate regulation. The SDWA implicitly exercises the Commerce Clause authority granted to Congress in Article I of the Constitution. The EPA asserts that several public water systems engage in interstate commerce by selling water over State lines, and thus the Act is not subject to a facial challenge. While the Commerce Clause authority is expansive, recent cases have revitalized the Tenth Amendment and reasserted the province of state sovereignty, specifically with regard to the police power.

A. The Safe Drinking Water Act

The Safety of Public Water Systems, Safe Drinking Water Act, authorizes the EPA to promulgate contaminant regulation for the provision of drinking water by public water systems

The difference between an “adverse health effect” and a “precursor event” is not insignificant with regard to placing limits on the EPA’s authority to regulate drinking water. Health events can be thought of as a continuum, with no effect on one end and adverse effects on the other, and precursor events in the middle. A precursor event is a non-harmful health event on the continuum of possible health side effects from exposure and would necessarily precede any harmful or adverse health effect. See, e.g., 73 Fed. Reg. at 60,266 (explaining that iodide uptake inhibition is a precursor event and outlining the general difference between the two terms). Additionally, the Agency’s changed position on what constitutes “sufficient frequency” renders the statutory scheme less predictable, making the entire endeavor look arbitrary at best and capricious at worst.

See infra Part II.D for a discussion of the relevant authorities on the SDWA.

See United States v. Morrison, 529 U.S. 598, 607 (2000) (noting that every congressional act must exercise an affirmative grant of power from the Constitution); Nebraska v. EPA, 331 F.3d 995, 998 (D.C. Cir. 2003) (inferring that the authority for the statute derived from the Commerce Clause).

Brief of Respondent at 21–22, Nebraska v. EPA, 331 F.3d 995 (D.C. Cir. 2003).

See infra Part II.C for a discussion of Commerce Clause and Tenth Amendment jurisprudence.

The term “contaminant” is defined as “any physical, chemical, biological, or radiological substance or matter in water.” 42 U.S.C.A. § 300f(10) (West, Westlaw through Dec. 7, 2012).
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(PWSs). By its terms, the SDWA applies to all public water systems and requires the EPA to set standards for drinking water quality. Binding regulation occurs in the form of National Primary Drinking Water Regulations (NPDWRs). NPDWRs specify either a Maximum Contaminant Level (MCL) or an approved treatment technique for a given contaminant. These regulations also outline quality control and testing procedures to ensure compliance.

There are two major facets to regulation under the SDWA: eligibility of contaminants and the process for promulgating regulation. Contaminants become eligible for SDWA regulation upon the EPA Administrator’s determination that said contaminant meets the statutory requirements. After that decision, the EPA may decide regulation is not necessary or beneficial, or it may decide to begin the process of promulgation. The first subsection deals with the three requirements and their somewhat murky character. The second subsection deals with the general process of creating SDWA regulations.

1. Statutory Backdrop

A contaminant must meet three criteria to be eligible for regulation under the SDWA. The EPA Administrator must determine that (1) “the contaminant may have an adverse effect on the health of persons;” (2) “the contaminant [occurs or is likely to occur] in public water systems with a frequency and at levels of public health concern;” and (3) “in the sole judgment of the

32 A “public water system” provides water for human consumption, through pipes or conveyances, and has at least fifteen service connections or regularly serves at least twenty-five individuals. Id. § 300f(4)(A).
33 Id. § 300g-1(b).
34 Id. § 300f(1).
35 Id. § 300f(1)(C).
36 Id. § 300f(1)(D).
37 Id. § 300g-1.
38 Id. § 300g-1(b)(1)(A).
39 Id. § 300g-1(b)(1)(B).
40 Id. §§ 300g-1(b)(1)(A)(i)–(iii).
41 Id. § 300g-1(b)(1)(B).
Administrator, regulation of such contaminant presents a meaningful opportunity for health risk reduction for persons served by public water systems.”

Jurisdictional clauses throughout the SDWA determine when and how stakeholders and interested individuals may bring petitions to a judicial body, and on what grounds.

The definition of an “adverse health effect” is not entirely clear. One source defines it as “the causation, promotion, facilitation and/or exacerbation of a structural and/or functional abnormality, with the implication that the abnormality produced has the potential of lowering the quality of life, contributing to a disabling illness, or leading to a premature death.” Another source defines the term as “a change in body function or cell structure that might lead to disease or health problems.” The EPA does not offer direct guidance as to what constitutes an adverse health effect for non-carcinogens. However, the agency states that it calculates a contaminant

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42 Id. § 300g-1(b)(1)(A)(i)-(iii).
43 For example, 42 U.S.C.A. § 300g-1(b)(1)(B)(i)(III) states that the determination of which unregulated contaminants are selected for a given Contaminant Candidate List, and therefore possible future regulation, is not subject to judicial review. Section 300j-7 contains the general judicial review provisions of the SDWA and requires, among other things, that actions pertaining to the establishment of regulations be filed only in the D.C. Circuit. Jurisdiction clauses will not be the focal point of this Comment. Research has revealed no scholarship on the jurisdictional clauses of the SDWA. For an interesting look at the role of executive (including agencies) acquiescence in jurisdiction stripping clauses, see Tara Leigh Grove, The Article II Safeguards of Federal Jurisdiction, 112 COLUM. L. REV. 250 (2012). This Comment will largely not touch the issue of enforcement. For these purposes, it suffices to say that, pursuant to § 300g-2, individual States will generally have enforcement responsibility for all SDWA regulations.

44 See supra note 26 for a functional definition of the difference between an adverse health effect and a precursor event.
47 See Drinking Water: Regulatory Determinations Regarding Contaminants on the Second Drinking Water Contaminant Candidate List—Preliminary Determinations, 72 Fed. Reg. 24,016,
reference dose (RfD) “without an appreciable risk of deleterious effects during a lifetime,” and takes into consideration the health effects of contaminants on particularly vulnerable subgroups. In previous instances, “adverse health effects” giving rise to regulation included conditions ranging from stomach distress, brain damage, skin damage, and circulatory problems. As of this writing, all NPDWRs cite an observable adverse health effect as the reason for regulation.

The second prong, dealing with the occurrence and frequency of a contaminant in PWSs, proves similarly difficult to define. Prior regulations, and the statute, offer little guidance. The EPA uses Unregulated Contaminant Monitoring Regulation (UCMR) data to determine where and at what levels a contaminant exists in PWSs. For the UCMR data to be useful, the EPA

24,021 (May 1, 2007) (discussing the use of carcinogenic and non-carcinogenic health data for creating a health reference level).


49 See 40 C.F.R. § 141.54(b)(1) (2012) (requiring that PWSs provide their customers information with respect to health effects of arsenic).

50 See, e.g., id. (outlining the possible adverse health effects of arsenic).


52 Occurrence Data: Accessing Unregulated Contaminant Monitoring Data, EPA, http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/data.cfm (last updated Aug. 16, 2012). There are three sets of UCMR data, referred to as UCMR 1, UCMR 2, and UCMR 3. All data sets can be accessed at the above website.
calculates a Health Reference Level (HRL) using an RfD established to be protective of human health, such that the overall formula is:

\[
HRL = \frac{(RfD \times BW)}{DWI} \times RSC.
\]

UCMR data is then compared with the HRL to determine how frequently a contaminant occurs in PWSs at levels of public health concern. While the process for determining how frequently a contaminant occurs and at what levels is relatively easy, the EPA does not offer guidance as to what frequency is sufficient to trigger regulation.

Finally, the SDWA contains a subjective third prong for proper regulation. The third prong requires that, “in the sole judgment of the [EPA] Administrator, regulation of [a given] contaminant presents a meaningful opportunity for health risk reduction for persons served by public water systems.” On its face, the EPA Administrator’s evaluation of health risk reduction is necessarily subjective and amounts to an individual decision without any objective standard or

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53 An RfD that is protective of human health may be established at the “no-observed-effect-level” (NOEL) or “no-observed-adverse-effect-level” (NOAEL). Drinking Water: Preliminary Regulatory Determination on Perchlorate, 73 Fed. Reg. 60,262, 60,267 (Oct. 10, 2008).

54 OFFICE OF GROUND WATER AND DRINKING WATER, supra note 48, at 2-10 (where BW is a presumed adult body weight of seventy kilograms, DWI is the presumed daily adult drinking water intake of two liters per day, and RSC is the relative source contribution to overall contaminant levels and is set at a default value of twenty percent); see, e.g., 73 Fed. Reg. at 60,275 (using the same formula).

55 See, e.g., 73 Fed. Reg. at 60,269–71, 60,275–77 (discussing the UCMR data on perchlorate, the health reference level, and concluding that perchlorate occurs infrequently at levels of health concern in public water systems).

56 None of the NPDWR announcements include a discussion of what percentage of PWSs must reach threshold levels for a contaminant to occur “sufficiently frequently” to be a public health concern.

external review. 58 No EPA guidance exists that explains when regulation will present a meaningful opportunity for public health risk reduction. 59

A contaminant that meets these three criteria is eligible for listing on a Contaminant Candidate List (CCL) and for potential future regulation. 60 Neither the Administrator’s decision to include an unregulated contaminant on a CCL, nor the determination that a given contaminant meets the statutory criteria, is subject to judicial review. 61

2. Promulgating Regulation Under the SDWA

Regulation under the SDWA is a complex and protracted exercise. Multiple steps are required before regulation can be enacted, and the process may take years. 62 Throughout the regulatory process, opportunities exist for public input and comment that can be utilized to shape and inform the direction of regulation. 63

58 The statute goes on to say that “[t]he [EPA] Administrator’s decision whether or not to select an unregulated contaminant for a [Contaminant Candidate List and possible future regulation] … shall not be subject to judicial review.” Id. § 300g-1(b)(1)(B)(i)(III).

59 The EPA provides a basic information website related to the SDWA, where it addresses the question of how the EPA makes determinations to regulate. The EPA’s answer to this question is a restatement of the three prong test from the SDWA and does not further expound on what qualifies as a “meaningful opportunity” to reduce public health risks. See Regulating Public Water Systems and Contaminants Under the Safe Drinking Water Act, EPA, http://water.epa.gov/lawsregs/rulesregs/regulatingcontaminants/basicinformation.cfm (last updated May 21, 2012).

60 See 42 U.S.C.A. § 300g-1(b)(1)(B)(i) (outlining the requirements for listing a contaminant to be considered for future regulation).

61 See supra note 43 for a discussion of 42 U.S.C.A. § 300g-1(b)(1)(B)(i)(III), limiting judicial review of CCLs, and why it is not the focus of this Comment.


63 The opportunity for public comment on unregulated contaminants begins before the publication of a CCL. 42 U.S.C.A. § 300g-1(b)(1)(B)(i)(I). A new CCL is published every five years, after consultation with the Scientific Advisory Board and public comment. Id. The public
The original enactment of the SDWA required the Administrator to assemble and maintain a National Contaminant Occurrence Database (NCOD) for drinking water as of August 6, 1996. The database contains information on the occurrence of regulated and unregulated contaminants in PWSs. UCMR data is published periodically and includes occurrence and frequency information for a list of unregulated contaminants.

Beginning no later than February 1998, and every five years thereafter, the statute requires the Administrator to publish a CCL of presently unregulated contaminants that occur or may occur in PWSs, and may require SDWA regulation. The regulatory process commences before publication of the CCL, when the Administrator consults with the scientific community, including the Science Advisory Board (SAB), the NCOD, and the public to determine which contaminants should be listed for observation and ultimately included in the CCL. When using scientific evidence in the decision making process, the EPA Administrator must consult peer-reviewed studies and supporting studies conducted according to objective scientific principles and must use data collected by accepted methods. then has an opportunity to comment on any contaminants selected for regulatory determinations. Every step of the regulatory process involving a maximum contaminant level is open for public comment. When a regulation involves specific treatment techniques, the EPA Administrator is required to seek public comment on proposed technologies and any available alternatives.

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64 Id. § 300j-4(g)(1).
65 Id.
66 See Occurrence Data: Accessing Unregulated Contaminant Monitoring Data, supra note 52.
68 Id. § 300g-1(b)(1)(B)(i).
69 Id. § 300g-1(b)(1)(B)(i)(I).
70 Id. § 300g-1(b)(3)(A).
Determinations to regulate require findings that a contaminant fulfills the three SDWA criteria. 71 Such findings must be based on the NCOD and other available sources of public health information. 72 Once the Administrator determines that a given contaminant will be regulated, the Administrator must propose a Maximum Contaminant Level Goal (MCLG) and an NPDWR within twenty-four months. 73 MCLGs must be set at the level at which there are no known or anticipated adverse health effects and should provide a margin of safety for the most vulnerable populations. 74 The EPA must set MCLs as close to the MCLG as feasible, 75 considering costs and the best technology and treatment techniques available. 76

When proposing an NPDWR that specifies an MCL, and any alternative MCLs under consideration, the Administrator must analyze and seek public comment on the following seven factors:

1) Quantifiable and non-quantifiable health risk reduction benefits for which there is evidence to conclude such benefits are likely to occur as a result of compliance with each level;
2) Quantifiable and non-quantifiable health risk reduction benefits for which there is evidence to conclude such benefits are likely to occur from reduction in co-occurring contaminants that may reasonably be attributed to compliance with the MCL;
3) Quantifiable and non-quantifiable costs for which there is evidence to conclude such costs are likely to occur solely as a result of compliance with the MCL and monitoring requirements;
4) Incremental costs and benefits associated with alternative MCLs;
5) Effects of the contaminant on the general population and on vulnerable subgroups;
6) Increased health risks that may occur as a result of compliance, including the risk of co-occurring contaminants; and
7) Any other relevant factors, including the quality and extent of information used for the above analyses. 77

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71 Id. § 300g-1(b)(1)(A).
72 Id. § 300g-1(b)(1)(B)(ii)(II).
73 Id. § 300g-1(b)(1)(E).
74 Id. § 300g-1(b)(4)(A).
75 Id. § 300g-1(b)(4)(B).
76 Id. § 300g-1(b)(4)(D).
77 Id. §§ 300g-1(b)(3)(C)(i)(I)–(VII).
The EPA must promulgate a final MCLG and NPDWR within eighteen months of the proposal.\textsuperscript{78} Perchlorate regulation follows this process, complex as it may be.

B. \textit{Perchlorate Regulation Under the SDWA}

Analyzing perchlorate regulation requires an understanding of how perchlorate operates in the body and the potential health risks, as well as an understanding of the myriad sources of perchlorate exposure, and finally a survey of the regulatory process to-date. Perchlorate competitively inhibits iodide uptake in the thyroid through higher affinity bonding with the sodium iodide symporter and may lead to hypothyroidism\textsuperscript{79} or other thyroid disruptions.\textsuperscript{80} Some water sources contain naturally occurring perchlorate, but it is more commonly found near industrial sites manufacturing explosives.\textsuperscript{81} Perchlorate exposure often occurs through food ingestion.\textsuperscript{82} Beginning in 1998, the EPA has monitored perchlorate concentrations through UCMR data and announced a preliminary decision to not regulate in October 2008.\textsuperscript{83} In February 2011, the EPA announced a regulatory determination that perchlorate regulation presents a meaningful opportunity to reduce public health risks and thereby began the process of regulatory

\textsuperscript{78} The deadline may be extended by nine months through notice in the Federal Register. \textit{Id.} § 300g-1(b)(1)(E).


\textsuperscript{80} \textsc{Natl. Research Council, Health Implications of Perchlorate Ingestion} 36–37 (2005), \textit{available at} http://books.nap.edu/catalog.php?record_id=11202.


\textsuperscript{83} \textit{Id.}
promulgation. A final regulation should be proposed by February 11, 2013, twenty-four months after the official determination to regulate.

1. Health Effects of Perchlorate

Perchlorate is a naturally occurring and man-made anion that is used to form a variety of salts. Although primarily used as an oxidizer in solid rocket fuel and other propellants, perchlorate can also be found in fireworks, common explosives, bleach, some fertilizers, and air-bag inflation devices. Unrelated to its industrial uses, perchlorate has been used successfully to treat hyperthyroidism. For non-hyperthyroidic individuals, perchlorate may disrupt the thyroid’s ability to produce hormones needed for normal growth and development, especially in pregnant women, young children, and developing fetuses. Individuals with a lower iodine intake, especially women, seem to be more susceptible to these issues. Iodine deficiency, and conditions that prevent the use of iodine in making thyroid hormone, can lead to a decrease of thyroid hormone circulating in the blood and manifest in symptoms of hypothyroidism.

86 “Perchlorate” is the name for than ion with chemical formula ClO$_4^-$.
87 Id.; Perchlorate, AM. WATER WORKS ASS’N, supra note 81.
89 See Ann F. Godley & John B. Stanbury, Preliminary Experience in the Treatment of Hyperthyroidism with Potassium Perchlorate, 14 J. CLINICAL ENDOCRINOLOGY & METABOLISM 70, 70 (Jan. 1954) (discussing how perchlorate has been used to treat hyperthyroidism).
90 See generally Perchlorate, EPA, supra note 87; Perchlorate, AM. WATER WORKS ASS’N, supra note 81.
92 Id.
Public health concerns involving perchlorate exposure focus exclusively on thyroid function. Properly functioning thyroid glands remove iodide from the oxygenated bloodstream and concentrate the iodide anion in the processes of hormone synthesis and storage. Iodide is an essential component of two thyroid hormones, T3 and T4, and therefore the transfer of iodide from the blood to the thyroid is an essential step in this synthesis. The sodium iodide symporter (NIS) molecule governs iodide transport from the blood into the thyroid. NIS molecules bond tightly with iodide and with high affinity, but they will also bind and transport similarly shaped and electrically charged molecules, such as perchlorate. NIS has a higher affinity for perchlorate and other similar substances than for iodide. Perchlorate competitively inhibits iodide transfer into the thyroid via NIS molecules and may thus interfere with normal thyroid function. Iodide transport inhibition can result in an intrathyroidal iodide deficiency, leading to a decrease in T3 and T4 production owing to lack of iodide availability.

Thyrotropin, the thyroid-stimulating hormone produced by the anterior pituitary gland, stimulates thyroid function. T4, T3, and thyrotropin create something akin to a feedback loop, such that T4 and T3 inhibit thyrotropin secretion and thereby decrease the production of NIS

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95 NAT’L RESEARCH COUNCIL, HEALTH IMPLICATIONS OF PERCHLORATE INGESTION, supra note 80, at 36–37.
97 Id. at 49.
98 Id.
99 Id.
100 Id.
101 NAT’L RESEARCH COUNCIL, HEALTH IMPLICATIONS OF PERCHLORATE INGESTION, supra note 80, at 39.
molecules.\textsuperscript{102} Iodide deficiency interferes with this feedback loop and stimulates production of NIS independent of thyrotropin levels.\textsuperscript{103} To maintain blood serum levels of thyroid hormones, the body compensates for low-level iodide deficiency through increased thyrotropin secretion and the subsequent increase in T4 and T3 production.\textsuperscript{104} Generally, the body compensates for iodide deficiency and individuals have no clinical consequences or abnormalities, that is, they maintain normal blood serum levels of T4 and thyrotropin, and the thyroid does not become enlarged.\textsuperscript{105}

Hypothyroidism, of varying degrees, results from continued and severe iodide deficiency or other thyroidic perturbations.\textsuperscript{106} While sustained changes in T4 and thyrotropin secretion may result in thyroid hypertrophy and hyperplasia,\textsuperscript{107} thyroid hormone production must fall and remain substantially low for a prolonged period before adverse effects occur.\textsuperscript{108} Subclinical hypothyroidism generally presents asymptptomatically and may be found in 4–8.5\% of adults in the United States.\textsuperscript{109}

\textsuperscript{102} Id.

\textsuperscript{103} Id.


\textsuperscript{105} Id.

\textsuperscript{106} NAT’L RESEARCH COUNCIL, \textit{Health Implications of Perchlorate Ingestion}, supra note 80, at 49. Hypothyroidism may be termed subclinical, overt, primary, or central (pituitary), and may be permanent, transient, congenital or acquired. \textit{Id.} at 49–50. The varying subtypes classify hypothyroidism of varying degrees and resultant from differing causes. \textit{Id.}


\textsuperscript{108} NAT’L RESEARCH COUNCIL, \textit{Health Implications of Perchlorate Ingestion}, \textit{supra} note 80, at 50.

\textsuperscript{109} Martin I. Surks et al., \textit{Subclinical Thyroid Disease: Scientific Review and Guidelines for Diagnosis and Management}, 291 J. AM. MED. ASS’N 228, 231 (Jan. 2004). Subclinical thyroidism can also be found in 2.5\% of pregnant women, a number statistically lower than the prevalence in the general population. R. Z. Klein et al., \textit{Prevalence of Thyroid Deficiency in Pregnant Women}, 35 CLINICAL ENDOCRINOLOGY 41, 41 (1991).
Studies of perchlorate’s effects have been mixed, with one study showing no effect on blood serum hormone levels and another identifying such effects.\textsuperscript{110} The National Research Council, in its 2005 survey of available perchlorate/thyroid research, concluded that the available epidemiologic evidence did not support a causal link between perchlorate exposure and congenital hypothyroidism, changes in thyroid function in healthy newborns, or thyroid disorders in adults.\textsuperscript{111}

2. Sources and Occurrence of Perchlorate

Multiple sources contribute to human intake or ingestion of perchlorate.\textsuperscript{112} Human exposure occurs by drinking water or eating food that contains perchlorate, or by working in manufacturing areas that include production of perchlorate-containing products.\textsuperscript{113} Highly water-soluble, perchlorate may enter water through natural or undefined sources.\textsuperscript{114} Perchlorate may also be found in proximity to sites where solid rocket fuel is used or manufactured.\textsuperscript{115}

A full and fair assessment of perchlorate exposure necessarily considers exposure from sources other than drinking water, that is, relative source contributions.\textsuperscript{116} The EPA primarily

\textsuperscript{110} See 73 Fed. Reg. at 60,266 (citing Yona Amitai et al., Gestational Exposure to High Perchlorate Concentrations in Drinking Water and Neonatal Thyroxine Levels, 17 THYROID 843 (2007) and Benjamain C. Blount et al., Urinary Perchlorate and Thyroid Hormone Levels in Adolescent and Adult Men and Women Living in the United States, 114 ENVTL. HEALTH PERSPECTIVES 1865 (2006)).

\textsuperscript{111} NAT’L RESEARCH COUNCIL, HEALTH IMPLICATIONS OF PERCHLORATE INGESTION, supra note 80, at 109–11.

\textsuperscript{112} Nat’l Ctr. for Envtl. Health, Perchlorate Fact Sheet October 5, 2006, supra note 91.

\textsuperscript{113} Id.

\textsuperscript{114} Perchlorate, AM. WATER WORKS ASS’N, supra note 81.

\textsuperscript{115} Id.

\textsuperscript{116} Drinking Water: Preliminary Regulatory Determination on Perchlorate, 73 Fed. Reg. 60,262, 60,271 (Oct. 10, 2008). The EPA notes that individuals are likely to be exposed to contaminants from sources other than drinking water, and that “total exposure to a contaminant is more relevant to . . . adverse health effects than . . . exposure . . . from drinking water alone.” Id.
used two studies to evaluate dietary source contributions to perchlorate exposure.\textsuperscript{117} Combining data from the two studies, the EPA determined that pregnant women at the ninetieth percentile of food-source perchlorate intake were at the greatest risk for perchlorate contamination through drinking water.\textsuperscript{118}

3. Regulatory History of Perchlorate

Perchlorate appeared on the first CCL (CCL 1) in 1998.\textsuperscript{119} Preliminary regulatory decisions for CCL 1 were announced on June 3, 2002, and perchlorate was not on the list for potential regulation.\textsuperscript{120} The EPA announced formal regulatory decisions for CCL 1 contaminants on July 18, 2003.\textsuperscript{121} A draft of the second CCL (CCL 2) appeared in April 2004, and again

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\textsuperscript{117} Id. The first study, the \textit{Total Diet Study}, U.S. FOOD AND DRUG ADMINISTRATION, http://www.fda.gov/Food/FoodSafety/FoodContaminantsAdulteration/TotalDietStudy/default.htm (last updated Feb. 27, 2012), used nationwide sampling and analysis of a large variety of food items and nationwide surveys of food intake to estimate dietary-source exposure rates for myriad demographics in the U.S. The second study involved EPA and Centers for Disease Control analysis of the National Health and Nutrition Examination Survey, \textit{National Health and Nutrition Examination Survey Homepage}, CENTERS FOR DISEASE CONTROL, http://www.cdc.gov/nchs/nhanes.htm (last updated Dec. 19, 2012). This analysis combined survey data and UCMR monitoring to estimate perchlorate exposure from food and water sources. 73 Fed. Reg. at 60,271.

\textsuperscript{118} Id. at 60,277.


\textsuperscript{120} See Announcement of Preliminary Regulatory Determinations for Priority Contaminants on the Drinking Water Contaminant Candidate List, 67 Fed. Reg. 38,222, 38,228 (June 3, 2002) (listing the nine contaminants to be regulated at the time: perchlorate was not one of them); CCL 1 List and Regulatory Determinations, supra note 117 (listing contaminants on the first CCL, not including perchlorate); see also 73 Fed. Reg. at 60,264 (discussing history of perchlorate regulation).

\textsuperscript{121} Announcement of Regulatory Determinations for Priority Contaminants on the Drinking Water Contaminant Candidate List, 68 Fed. Reg. 42,898 (July 18, 2003); CCL 1 List and Regulatory Determinations, supra note 119; see also 73 Fed. Reg. at 60,264 (discussing history of perchlorate regulation).
included perchlorate. The final list was published ten months later, in February 2005. In January 2006, the EPA issued guidance under the National Oil and Hazardous Substances Contingency Plan—for protective measures and potential cleanup levels—at a preliminary goal of 24.5 micrograms per liter, or 24.5 parts per billion.

The EPA published preliminary regulatory determinations for eleven contaminants on May 1, 2007. While the EPA did not publish a regulatory determination for perchlorate at that time, the notice did mention that making such a determination was a high priority. As of the 2007 notice, the EPA needed more information to make an adequate determination of whether perchlorate regulation was appropriate under the SDWA. Specifically, the EPA needed more information about perchlorate exposure and whether regulation would present a meaningful opportunity for public health risk reduction.

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127 Id.
128 Id.
Final determinations for the eleven contaminants were published on July 30, 2008, and a preliminary regulatory determination for perchlorate came in October of the same year. In October 2008, the EPA made a “preliminary regulatory determination . . . that a national primary drinking water rule [was] not necessary for perchlorate because a national primary drinking water regulation would not provide a meaningful opportunity to reduce health risk.” To make such a determination, the EPA had to evaluate the other two SDWA requirements for proper regulation, and found that, at sufficiently high doses, perchlorate “may have an adverse effect on the health of persons,” and that it “occurs infrequently at levels of public health concern in public water systems.”

In 2009, the Office of Water for the EPA published an Interim Drinking Water Health Advisory for Perchlorate with a health advisory level of 15 parts per billion. In accordance with the statute, the EPA then accepted public comment, specifically on the use of science in a regulatory determination and whether perchlorate regulation would present a meaningful opportunity to reduce public health risks. Individuals and stakeholders submitted more than six thousand comments on the 2009 notice, largely focused on alternative methods of assessing

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130 73 Fed. Reg. 60,262.
131 Id. at 60,265.
132 Id. at 60,274.
133 Id. at 60,275.
whether potential perchlorate regulation would offer a meaningful opportunity to reduce public health risks.\textsuperscript{136}

On February 11, 2011, the EPA announced its Regulatory Determination on Perchlorate.\textsuperscript{137} Therein, the EPA announced its finding that perchlorate regulation presents a meaningful opportunity for health risk reduction, that perchlorate exposure may have adverse health effects, and that perchlorate occurs with sufficient frequency at levels of public health concern to justify initiating the process of proposing a perchlorate NPDWR.\textsuperscript{138}

The health effect that the EPA referred to is iodide uptake inhibition, which is considered a biochemical precursor event.\textsuperscript{139} The first adverse health effect of perchlorate exposure, according to the National Research Council of the National Academy of Sciences, is hypothyroidism.\textsuperscript{140} In terms of frequency, the EPA adjusted its analysis for the 2011 regulatory decision. Although the HRL derived by the EPA in 2008 was 15 parts per billion, a level considered to be protective of the most sensitive populations, the EPA used multiple HRLs for the 2011 determination that reversed the October 2008 preliminary determination.\textsuperscript{141} Fewer than

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{136} \textit{Id.}; see also \textit{Drinking Water: Perchlorate Supplemental Request for Comments}, \textsc{Regulations.gov}, http://www.regulations.gov/#!docketDetail;D=EPA-HQ-OW-2009-0297 (last visited Dec. 20, 2012).
\item \textsuperscript{137} 76 Fed. Reg. 7762.
\item \textsuperscript{138} \textit{Id.} at 7765.
\item \textsuperscript{139} \textit{Id.} at 7763. See \textit{supra} notes 25–26 for an explanation of the difference between adverse health effects and precursor events.
\item \textsuperscript{140} \textit{Drinking Water: Preliminary Regulatory Determination on Perchlorate}, 73 Fed. Reg. 60,262, 60,266 (Oct. 10, 2008); see also \textsc{National Research Council, Health Implications of Perchlorate Ingestion, supra} note 80, at 165–66 (noting that, while the EPA defined an adverse effect as a change in serum thyroid hormone concentrations, the committee considered these changes precursor events and “conclude[d] that hypothyroidism [was] the first adverse effect”).
\item \textsuperscript{141} 76 Fed. Reg. at 7765.
\end{enumerate}
\end{footnotesize}
forty-five of the 3,865 samples PWSs had perchlorate detections at the 15 parts per billion level during the collection of UCMR 1.  

Based on the statutory time limitations, an MCLG and proposed NPDWR for perchlorate were due by February 11, 2013: twenty-four months after the official determination to regulate. The EPA did not meet its February 11 deadline and did not post any kind of notice in the Federal Register.

C. Constitutionality of the SDWA

When Congress passes a law, it must be, explicitly or implicitly, exercising its allotted authority under the Constitution and be operating within those bounds. The SDWA presumably invokes Commerce Clause authority teamed with the Necessary and Proper Clause. The Tenth Amendment cabins Article I authority, and any exercise thereof must comply with federalist principles and the vertical separation of powers. One of the powers reserved to the states is the police power to regulate for the public health. Regulating for the public health is the same purpose espoused by legislators for enacting the SDWA.

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142 Id. at 7764; see also Occurrence Data: Accessing Unregulated Contaminant Monitoring Data, supra note 52.
144 A search of the Federal Register and www.regulations.gov revealed nothing from the EPA about a proposed perchlorate regulation or an explanation for the delay. As of this writing, there remains no perchlorate MCLG or proposed NPDWR.
146 See Nebraska, 331 F.3d at 998 (inferring that, because several PWSs may sell drinking water over state lines, the authority for the statute derived from the Commerce Clause).
1. The Commerce Clause

Powers and limitations of the federal government are laid out in the Constitution. For the houses of Congress, Article I governs.\textsuperscript{150} Article I outlines the composition and election of both houses, vests the legislative powers of the United States, and outlines specific powers of the Congress, including the ability to borrow funds on behalf of the United States, establish procedures of naturalization, and declare war, amongst other specifically enumerated grants of power.\textsuperscript{151} Article I specifically prohibits certain powers to the Congress, including the inability to legislate retroactively, to tax state exports, or to grant titles of nobility, among others.\textsuperscript{152}

Potentially the two most well-known Article I powers are the Commerce Clause\textsuperscript{153} and the Necessary and Proper Clause.\textsuperscript{154} The Necessary and Proper Clause allows Congress “[t]o make all Laws which shall be necessary and proper for carrying into Execution the foregoing Powers, and all other Powers vested . . . in the Government of the United States . . . .”\textsuperscript{155} Under the Commerce Clause, Congress has the power “[t]o regulate commerce with foreign Nations, and among the several States, and with the Indian Tribes.”\textsuperscript{156} Teamed together, the two clauses provide a powerful foundation for most federal regulation.\textsuperscript{157}

\textsuperscript{150} See U.S. CONST. art. I, § 8 (enumerating the powers of Congress); U.S. CONST. amend. X (reserving to the states and the people all powers not given to Congress in the Constitution).
\textsuperscript{151} See generally U.S. CONST. art. I.
\textsuperscript{152} See generally U.S. CONST. art. I, § 9.
\textsuperscript{153} U.S. CONST. art. I, § 8, cl. 3.
\textsuperscript{154} U.S. CONST. art. I, § 8, cl. 18.
\textsuperscript{155} U.S. CONST. art. I, § 8, cl. 18.
\textsuperscript{156} U.S. CONST. art. I, § 8, cl. 3.
\textsuperscript{157} See, \textit{e.g.}, Gonzales v. Raich, 545 U.S. 1, 34 (2005) (Scalia, J., concurring) (discussing the interaction of the Commerce Clause and the Necessary and Proper Clause with regard to interstate and intrastate regulation); United States v. Lopez, 514 U.S. 549, 588 (1995) (Thomas, J., concurring) (asserting that Commerce Clause authority added to Necessary and Proper clause authority renders other enumerated powers superfluous); New York v. United States, 505 U.S. 144, 158–59 (1992) (noting that the Court’s “broad construction of . . . [the Commerce Clause] has . . . been guided . . . by the Constitution’s Necessary and Proper Clause”).
The Commerce Clause enjoys extensive current and historical treatment in legal scholarship and case law.\textsuperscript{158} Much of the relevant treatment relates to the definitions of “commerce,”\textsuperscript{159} or “affecting commerce,”\textsuperscript{160} and “among the States.”\textsuperscript{161} Modern case law evinces “three broad categories of activity” that Congress may properly regulate under the Commerce Clause.\textsuperscript{162} First, regulation is proper when it regards the channels used for interstate commerce, such as navigable waters.\textsuperscript{163} Second, Congress may regulate the instrumentalities, people, and things involved in interstate commerce, even when such things have an intrastate character.\textsuperscript{164}

\textsuperscript{158} A quick WestlawNext search of secondary sources for “commerce clause” returns 9,980 law review and journal articles on the varying aspects of the subject. A similar search of all state and federal case material returns more than 10,000 cases dealing with the Commerce Clause, of which 550 are Supreme Court cases.

\textsuperscript{159} See, e.g., Gibbons v. Ogden, 22 U.S. 1, 3 (1824) (“commerce” includes traffic, navigation, transportation of goods); N.L.R.B. v. Jones & Laughlin Steel Corp., 301 U.S. 1, 31 (1937) (defining commerce as “trade, . . . transportation, or communication among the several States . . .”) (quoting the National Labor Relations Act, now found at 29 U.S.C.A. § 152(6) (West, Westlaw through Dec. 7, 2012)); City of Philadelphia v. New Jersey, 437 U.S. 617, 622 (1978) (stating that no “objects of interstate trade” are excluded by the definition of commerce).

\textsuperscript{160} See, e.g., N.L.R.B., 301 U.S. at 31 (defining “affecting commerce” as “in commerce, or burdening or obstructing commerce or the free flow of commerce, or having led or tending to lead to a . . . burdening or obstructing [of] commerce or the free flow of commerce”) (quoting the National Labor Relations Act, now found at 29 U.S.C.A. § 152(7) (West, Westlaw through Dec. 7, 2012)); Nat’l Fed’n of Indep. Bus. v. Sebelius (The ACA), 132 S. Ct. 2566, 2578–79 (2012) (listing activities that have been said to “substantially affect interstate commerce,” including “a farmer’s decision to grow wheat” and “a loan shark’s extortionate collections from a neighborhood butcher shop”) (internal references omitted).

\textsuperscript{161} See, e.g., Wickard v. Filburn, 317 U.S. 111, 123–25 (1942) (interstate commerce includes those intrastate activities that directly affect interstate commerce); United States v. E.C. Knight Co., 156 U.S. 1, 16–17 (1895) (interstate commerce does not include manufacturing because it is a purely intrastate activity); see also Swift & Co. v. United States, 196 U.S. 375, 398 (1905) (stating that “commerce among the states is not a technical legal conception, but a practical one, drawn from the course of business).

\textsuperscript{162} United States v. Lopez, 514 U.S. 549, 558 (1995) (citing Perez v. United States, 402 U.S. 146, 150 (1971)); see also The ACA, 132 S. Ct. at 2578 (noting the three categories of proper regulation); Raich, 545 U.S. at 16–17 (discussing the three categories of Commerce Clause regulation).

\textsuperscript{163} The ACA, 132 S. Ct. at 2578; Raich, 545 U.S. at 16–17; Lopez, 514 U.S. at 558.

\textsuperscript{164} The ACA, 132 S. Ct. at 2578; Lopez, 514 U.S. at 558; see also Perez v. United States, 402 U.S. 146, 150 (1971) (listing the category of regulation and providing examples).
Third, Commerce Clause authority extends to regulating “those activities having a substantial relation to interstate commerce.”\(^{165}\)

Modern cases deal almost exclusively with the third category, as it is the hardest to define.\(^{166}\) Activities held to have a substantial relation to interstate commerce include growing wheat for personal use,\(^{167}\) the intrastate price of milk,\(^{168}\) and local extortion.\(^{169}\) While the Commerce Clause authority has expanded over the last hundred years, not all instances of its exercise have been upheld.\(^{170}\) In *United States v. Lopez*, for example, the Court struck down a federal provision criminalizing the possession of a gun in a school zone because it had no connection to even the broadest definition of commerce.\(^{171}\) The Court further noted that the statute lacked a jurisdictional hook that would ensure, on a case-by-case basis, that gun possession in the school zone actually impacted interstate commerce.\(^{172}\)

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\(^{165}\) *Lopez*, 514 U.S. at 558–59 (emphasis added); see also *The ACA*, 132 S. Ct. at 2578 (stating the same category); *Raich*, 545 U.S. at 16–17 (same); *Perez*, 402 U.S. at 150 (same).

\(^{166}\) See, e.g., *Perez*, 402 U.S. at 150 (stating that the case concerned only the third category).


\(^{168}\) *United States v. Wrightwood Dairy Co.*, 315 U.S. 110, 119 (stating that Congress could regulate the price of intrastate milk under the Commerce Clause).

\(^{169}\) *Perez*, 402 U.S. at 155 (stating that a congressional finding that local loansharking impacts national credit markets constituted a rational basis for federal power under the Commerce Clause).

\(^{170}\) See generally *Lopez*, 514 U.S. at 552–61 (describing development of Commerce Clause case history).

\(^{171}\) 514 U.S. at 560–62.

\(^{172}\) *Id.* This seems to suggest that regulation or legislation otherwise beyond the ambit of federal authority under the Commerce Clause can be made proper when it contains a jurisdictional hook ensuring implications of interstate commerce on a case-by-case basis. The *Lopez* Court cites to *United States v. Bass*, 404 U.S. 336 (1971), for an instance of judicial interpretation implying the required connection to interstate commerce when the statute was otherwise ambiguous. *Id.* at 562.
2. The Necessary and Proper Clause

Jurisprudence related to the Necessary and Proper Clause remains somewhat sparse. The most recent case directly analyzing the clause is *United States v. Comstock.*\(^{173}\) *Comstock* involved federal civil-commitment for the detainment of mentally ill sex-offenders, beyond the end of their incarceration.\(^{174}\) The question to the Court was whether the Necessary and Proper Clause granted adequate authority to enact the statute.\(^{175}\) Upholding Congress’s authority to enact the statute using the Necessary and Proper Clause, the Court noted five considerations for the exercise of that authority.\(^{176}\) The five considerations were: “breadth of the Necessary and Proper Clause;” the “history of federal involvement” in the subject matter; the government’s interest in the statute; the balancing of state and federal interests in the statute; and “the statute’s narrow scope.”\(^{177}\)

Far from utilizing arbitrary considerations to uphold the statute, the *Comstock* Court evaluated more than two hundred years of case law.\(^{178}\) The Necessary and Proper Clause offers Congress broad authority to legislate.\(^{179}\) “Necessary” has not been held to mean “absolutely necessary,” but rather an exercise of power using appropriate and adapted means to a legitimate end, not otherwise prohibited by the Constitution.\(^{180}\) Exercise of this authority requires a “means-

\(^{173}\) 130 S. Ct. 1949 (2010).
\(^{174}\) *Id.* at 1954.
\(^{175}\) *Id.* at 1956.
\(^{176}\) *Id.* at 1965. The Court expressly declined to reach any due process concerns in this case. *Id.*
\(^{177}\) *Id.*
\(^{178}\) *Id.* at 1956–65.
\(^{179}\) *Id.* at 1956; *see* McCulloch v. Maryland, 4 Wheat. 316, 408 (1819) (stating that a government entrusted with enumerated powers must be given broad means to execute those powers).
\(^{180}\) *McCulloch,* 4 Wheat. at 421; *see also* Jinks v. Richland County, 538 U.S. 456, 462 (2003) (reemphasizing that the Necessary and Proper Clause does not require the congressional act to be “absolutely necessary”).
end rationality” 181 analysis addressing “whether the means chosen are ‘reasonably adapted’ to the attainment of a legitimate end.” 182

Historical involvement by the federal government does not inherently support or undermine the constitutionality of a proposed congressional statutory scheme. 183 Rather than bearing on the constitutionality of a congressional act, legislative history bears on the “reasonableness of the relation” between a new or proposed scheme and existing government interests. 184 Further, the federal interest at stake in the congressional scheme must not contravene the letter or spirit of the constitution. 185 Part of this constitutional-end analysis includes balancing state and federal domains of power. 186 Finally, the Court consistently cautions against upholding statutes too attenuated from an explicit Article I power. 187

182 Gonzales v. Raich, 545 U.S. 1, 37 (2005) (quoting United States v. Darby, 312 U.S. 100, 121 (1941)); see also Comstock, 130 S. Ct. at 1956–57 (incorporating the prior jurisprudence into the Court’s analysis for the first consideration under the Necessary and Proper Clause).
183 Comstock, 130 S. Ct. at 1958; Raich, 545 U.S. at 21 (noting that a history of federal involvement can be helpful in assessing the substance of the congressional scheme) see also Walz v. Tax Comm’n of City of New York, 397 U.S. 664, 678 (1970) (“[N]o one acquires a vested or protected right in violation of the Constitution by long use”); cf. United States v. Morrison, 529 U.S. 598, 612–14 (2000) (stating that a history of federal involvement is neither necessary nor sufficient when evaluating exercise of Article I authority).
184 See McCulloch, 4 Wheat. at 421 (noting that a statute must “not [be constitutionally] prohibited”).
185 See McCulloch, 4 Wheat. at 421 (noting that a statute must “not [be constitutionally] prohibited”).
186 Comstock, 130 S. Ct. at 1962. The Court tests the statute against the Tenth Amendment, discussed infra in Subsection I.C.3.
187 See, e.g., Comstock, 130 S. Ct. at 1963 (stating that the link between the federal civil-commitment statute at issue and the enumerated power was not “too attenuated”); United States v. Lopez, 514 U.S. 549, 567 (1995) (cautioning against “piling inference upon inference” in upholding congressional actions).
3. The Tenth Amendment

Where the Commerce Clause grants Congress expansive authority to regulate instances of interstate commerce, the entirety of Article I powers is limited by the Tenth Amendment. Even in the most extraordinary of instances, Congress cannot legislate beyond its realm of authority as limited by the Tenth Amendment. Federalist principles built into the Constitution reserve the police power to the States. The police power includes the authority of States to regulate for the protection of public health within their territory.

The Tenth Amendment states simply that “[t]he powers not delegated to the United States by [the] Constitution, nor prohibited by it to the States, are reserved to the States, respectively, or to the people.” A Tenth Amendment analysis involves not only whether Congress has the affirmative authority under Article I to regulate a given activity, but whether the chosen method invades state sovereignty.

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188 Notably, the recent decision in The ACA case placed a check on congressional exercise of the Commerce Clause. 132 S. Ct. 2566, 2591 (2012). With regard to the individual mandate, the Court held that “[t]he proximity and degree of connection between the mandate and the subsequent commercial activity is too lacking to justify [federal legislation].” Id. It remains unclear how the new check on Commerce Clause power will impact future jurisprudence in the area.

189 Hammer v. Dagenhart, 247 U.S. 251, 274 (1918), overruled in part by United States v. Darby, 312 U.S. 100, 116–17 (1941) (“[t]he grant of authority over a purely federal matter was not intended to destroy the local power always existing and carefully reserved to the states in the Tenth Amendment”).


191 See U.S. CONST. amend. X (reserving to the states or the people those powers not explicitly granted to the federal government); The ACA, 132 S. Ct. at 2578 (reiterating that the police power is “possessed by the States but not by the Federal Government”).

192 Hillsborough Cnty. v. Automated Med. Labs., Inc., 471 U.S. 707, 719 (1985) (“regulation of health and safety matters is primarily, and historically, a matter of local concern”); Jacobson v. Massachusetts, 197 U.S. 11, 25 (1905); see The ACA, 132 S. Ct. at 2578 (explaining that the police power is a “general power [to] govern[]” that includes many “vital functions of modern government”).

193 U.S. CONST. amend. X.

194 Ass’n of Cmty. Orgs. for Reform Now v. Edwards, 81 F.3d 1387, 1393 (5th Cir. 1996).
positive expression of the limits on federal power, the Tenth Amendment affirmatively states that federal power has limits and the States retain a degree of sovereignty.

One such area of sovereignty is the so-called police power. In 1905, the Supreme Court affirmed that the police power was not surrendered to the federal government as part of the Constitution. Though lacking any definite limits, the police power includes the “distinctly recognized authority of a state to enact . . . ‘health laws of every description’ . . . .” Phrased differently, the States retain the power to enact reasonable regulations to protect and promote public health and safety.

Most recently, in National Federation of Independent Business v. Sebelius, commonly referred to as The ACA, the Court reiterated, “the police power is controlled by [fifty] different States instead of one national sovereign.” This diffusion of sovereign power to the States

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195 New York v. United States, 505 U.S. 144, 157 (1992); see also United States v. Darby, 312 U.S. 100, 124 (1941) (stating that the Tenth Amendment “states but a truism” and that “nothing in the history of its adoption . . . suggest[s] that it was more than declaratory of the relationship between the national and state governments”).

196 The ACA, 132 S. Ct. at 2578 (quoting THE FEDERALIST NO. 45, at 293 (James Madison)); Koog v. United States, 79 F.3d 452, 455 (5th Cir. 1996).

197 See id. at 2578 (stating that the police power resides with the States and the Federal Government has no such power); New York, 505 U.S. at 156 (positing that congressional power is restrained by the Tenth Amendment); see also Ass’n of Cnty. Orgs. for Reform Now v. Edwards, 81 F.3d 1387, 1393 (5th Cir. 1996) (stating that the Tenth Amendment “incorporates extra-textual limitations upon Congress’ exercise of its Article I powers”).


199 Jacobson, 197 U.S. at 25.


202 Id. at 2578.
ensured that matters involving everyday life are governed by local governments, accountable to the people in those communities, and not the federal government. 203

Recent Supreme Court jurisprudence also shows a trend that holds the Tenth Amendment to prohibit the federal government from commanding States to act, or commandeering State officials to enforce a federal regulatory program. 204 Beginning in 1992, the Court held a federal act requiring states to enact legislation to provide for the disposal of radioactive waste created within state borders violated the Tenth Amendment. 205 Building on New York v. United States, 206 the Court held in Printz v. United States 207 that it was impermissible under the Tenth Amendment for a federal statute to make state officials agents of a federal regulatory scheme. 208 Congress could thus not rely on Commerce Clause authority to force state officials to conduct background checks on gun purchasers. 209

These judicial developments set the backdrop for analyzing the SDWA and provide the framework for understanding why its constitutionality is subject to debate.

203 Id.
205 New York, 505 U.S. at 187–88; see also Lori Potter, Recent Decisions in the U.S. Supreme Court on Environmental Law, 27 COLO. LAW. 59, 60 (Apr. 1998)
208 Id. at 935; see also Potter, supra note 205, at 60.
209 Printz, 521 U.S. at 935.
D. Legal History of the SDWA: Case Law and Scholarship

There exists little case law or scholarship relating to the SDWA, and none specifically addressed to perchlorate. Several cases challenged the SDWA on constitutional grounds and met with varying success.\footnote{See \textit{infra} notes 211--42 and attendant text for a discussion of the major cases involving the SDWA, and notes 243--47 for the most relevant scholarship on the topic.}

The leading case with regard to the constitutionality of the SDWA is \textit{Nebraska v. E.P.A.},\footnote{331 F.3d 995 (D.C. Cir. 2003).} in which the State of Nebraska and other petitioners presented a facial challenge to the SDWA. Petitioners argued that the SDWA exceeds congressional authority because it “regulates the intrastate distribution and sale of drinking water.”\footnote{Id. at 998 (emphasis added).} The D.C. Circuit noted that a successful facial challenge would require a finding that under “no set of circumstances” would the statute be constitutional.\footnote{Id. at 998 (citing \textit{Amfac Resorts, L.L.C. v. United States Dep’t of Interior}, 282 F.3d 818, 826 (D.C. Cir. 2002), \textit{vacated in part on other grounds sub nom. Nat’l Park Hospitality Ass’n v. Dep’t of Interior}, 538 U.S. 803 (2003)).} Citing to the EPA website,\footnote{To find this information, see the EPA website at http://www.epa.gov/safewater/data/getdata.html.} the court noted that several PWSs sell “substantial volumes of drinking water across state lines.”\footnote{\textit{Nebraska}, 331 F.3d at 998.} Pursuant to the second category of proper congressional regulation under the Commerce Clause, the \textit{Nebraska} court upheld the SDWA because each of the interstate sales of drinking water presented a valid opportunity to exercise the commerce power.\footnote{Id. at 998 (citing \textit{United States v. Lopez}, 514 U.S. 549, 558 (1995)).} Noting that petitioners failed to meet the burden of a facial challenge to the SDWA, the court declined to address whether the intrastate sale of drinking water has a “sufficiently substantial impact on interstate commerce” to warrant federal
regulation.\textsuperscript{217} The court further held that, because the SDWA does not “compel the states to pass legislation or to enforce federal standards . . . [but r]ather . . . regulates the states only in their capacity as public water system owners,” it does not run afoul of federalist principles and therefore comports with the Tenth Amendment.\textsuperscript{218}

The petitioners in \textit{Nebraska} raised constitutional issues specifically with regard to the “Arsenic Rule”—a standard that regulates arsenic levels in drinking water.\textsuperscript{219} The court found that those arguments had not been adequately preserved at the agency level.\textsuperscript{220} Judge Randolph noted that “[a]gencies do not ordinarily have jurisdiction to pass on the constitutionality of federal statutes;” thus, petitioners were not required to raise constitutional questions related to the SDWA directly to the EPA during the administrative phases.\textsuperscript{221} However, because petitioners failed to raise any issues related to the Arsenic Rule during the administrative phases, and thereby failed to give the EPA an opportunity to hear arguments or fashion a more narrowly tailored rule, those arguments were not preserved and could not be heard on appeal.\textsuperscript{222}

The Fifth Circuit had occasion to review a specific provision of the SDWA—the Lead Contamination Control Act of 1988\textsuperscript{223}—that, amongst other things, required “States to establish remedial action programs for the removal of lead contaminants from school drinking water systems.”\textsuperscript{224} The relevant provision\textsuperscript{225} required that each State “establish a program,” consistent

\textsuperscript{217} \textit{Id.} at 998.
\textsuperscript{218} \textit{Id.} at 999.
\textsuperscript{219} \textit{Id.} at 997. The “Arsenic Rule” can be found at National Primary Drinking Water Regulations; Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring, 66 Fed. Reg. 6976, 6981 (Jan. 22, 2001). The MCLG for arsenic stands at 0 parts per billion, and the “enforceable MCL” is 10 parts per billion. \textit{Id.}
\textsuperscript{220} \textit{Nebraska}, 331 F.3d at 997–98.
\textsuperscript{221} \textit{Id.} at 997.
\textsuperscript{222} \textit{Id.} at 997–98.
\textsuperscript{223} Pub. L. No. 100-572, 102 Stat. 2884.
\textsuperscript{224} Ass’n of Cmty. Orgs. for Reform Now v. Edwards, 81 F.3d 1387, 1389 (5th Cir. 1996).
with the statute, to aid local educational institutions in remediating potential lead
contaminations.\textsuperscript{226} Further, States were potentially subject to civil enforcement proceedings or
fines, under another provision of the statute, if they did not establish such a program.\textsuperscript{227}

In \textit{Ass’n of Cmnty. Orgs. for Reform Now v. Edwards}, the court held that Congress could
properly exercise Commerce Clause authority to regulate lead contamination in drinking water
“by regulating drinking water coolers that move in interstate commerce.”\textsuperscript{228} However, to exercise
that power, Congress would have to regulate individuals directly, and not States “as conduits to
the people.”\textsuperscript{229} As such, the court held that provision of the SDWA to be an “unconstitutional
intrusion upon the States’ sovereign prerogative to legislate as it sees fit.”\textsuperscript{230}

Other cases have challenged specific regulations, and those regulations have been struck
down on varying grounds.\textsuperscript{231} All of these cases have two things in common: first, they are after-
the-fact challenges to specific regulations; and second, petitioners consistently argue that the
rules are arbitrary and capricious, or fly in the face of existing scientific studies, and are therefore
beyond the pale of EPA’s statutory authority under the SDWA.\textsuperscript{232}

\textsuperscript{225} Originally codified as 42 U.S.C. § 300j-24(d).
\textsuperscript{226} \textit{Edwards}, 81 F.3d at 1394.
\textsuperscript{227} \textit{Id.} The court did not go into any Eleventh Amendment concerns over the abrogation of
State sovereign immunity. For a discussion of state sovereign immunity doctrine and the
Eleventh Amendment, see \textit{Federalism—Abrogation of State Sovereign Immunity in Federal
\textsuperscript{228} 81 F.3d at 1394.
\textsuperscript{229} \textit{Id.}
\textsuperscript{230} \textit{Id.}
\textsuperscript{231} See, \textit{e.g.}, W.R. Grace & Co. v. EPA, 261 F.3d 330, 342 (3d Cir. 2001) (challenging
cleanup standards related to ammonia regulation); Chlorine Chemistry Co. v. EPA, 206 F.3d 1286, 1291 (D.C. Cir. 2000) (vacating chloroform regulation). In fairness, not all challenges to
specific regulations have been upheld. See, \textit{e.g.}, City of Waukesha v. EPA, 320 F.3d 228, 254
\textsuperscript{232} See, \textit{e.g.}, \textit{W.R. Grace & Co.}, 261 F.3d at 342 (deeming the cleanup standard for ammonia
to be arbitrary and capricious); \textit{Chlorine Chemistry Co.}, 206 F.3d at 1291 (holding the
chloroform MCLG arbitrary and capricious)
In *W.R. Grace & Co. v. EPA*, the EPA exercised emergency action authority pursuant to §1431(a) of the SDWA to require a reduction of ammonia levels in Lansing, Michigan, to 1.2 micrograms per liter. To arrive at this level, the EPA charged the newly-formed Saginaw Aquifer Technical Evaluation Team with evaluating four approaches to protecting the public health in Lansing. The Team settled on the 1.2 micrograms per liter level, but failed to explain how or why that number came into being, and failed to cite any technological study supporting the level. Petitioners filed a petition for review of the EPA’s authority to mandate a cleanup level of 1.2 micrograms per liter. The court found that the cleanup level was not “rationally based on the facts . . . to protect the public’s health” and vacated the EPA order for “fail[ing] to provide a rational explanation for concluding that [this] remediation . . . [was] necessary to protect the . . . public’s health.”

In *Chlorine Chemistry Council v. EPA*, the D.C. Circuit found that the EPA had exceeded its statutory authority by setting a 0 microgram per liter MCLG for chloroform because it was not scientifically necessary and therefore the regulation was arbitrary and capricious. Conversely, in *City of Waukesha v. EPA*, the D.C. Circuit upheld the EPA’s regulation of

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233 261 F.3d 330 (3d Cir. 2001).
234 42 U.S.C.A. § 300i(a) (West, Westlaw through Dec. 7, 2012) (allowing the EPA Administrator to take necessary action to protect the public health from an immediate and substantial threat created by contamination of a PWS).
235 261 F.3d at 340.
236 *Id.* at 335.
237 *Id.* at 341.
238 *Id.* at 337.
239 *Id.* at 344.
240 206 F.3d 1286 (D.C. Cir. 2000).
241 *Id.* at 1291.
242 320 F.3d 228 (D.C. Cir. 2003).
radionuclides and found that the regulation was not arbitrary or capricious because the EPA had used the best science available at the time.\textsuperscript{243}

The cases, regardless of outcome, show similar strands of reasoning: the regulations must be reasonably related to the protection of public health and must be supported by the best available science. Scholarship on the SDWA, however, focuses more on the statute than on individual regulations.

As mentioned, scholarly works relating the SDWA are few and far between. The most persuasive challenge to the SDWA has been on Commerce Clause grounds.\textsuperscript{244} Arguably the only article giving treatment to the constitutional aspects of the SDWA, Garrett Johnson argues that the SDWA invades the realm of health regulation, effectively eliminating state and local governments “from . . . policy-making.”\textsuperscript{245} Johnson’s argument traces modern Commerce Clause jurisprudence and the Nebraska case, ultimately concluding that the SDWA exceeds congressional authority because it is not an economic regulation.\textsuperscript{246} Other articles address aspects of the SDWA and federalism,\textsuperscript{247} or federalism as it relates to environmental law in general.\textsuperscript{248}

\begin{itemize}
\item \textsuperscript{243} \textit{Id.} at 257.
\item \textsuperscript{245} \textit{Id.} at 78–79.
\item \textsuperscript{246} \textit{Id.} at 84–93.
The SDWA is a complex federal statute that gives rise to ever more complex regulatory schemes. There has never been a serious constitutional challenge to the statute as a whole, and the breadth of scholarship treating the topic remains underwhelming. Despite this lack of legal history, the SDWA is an unconstitutional exercise of congressional authority.

III. DISCUSSION

In its current incarnation, the SDWA boasts laudable policy objectives, but it oversteps the bounds of congressional authority and is unconstitutional. Implicitly exercising a very broad Commerce Clause authority, the drafters of the SDWA failed to take account of the limiting principles of the Tenth Amendment and exceeded their constitutional authority in granting such unsupervised power to the EPA.

Even if the SDWA itself is a proper execution of congressional authority, the proposed perchlorate regulation does not comply with the Act and is outside the scope of the EPA’s regulatory powers. Regulations must be predicated on adverse effects on human health, not an amorphous “precursor event” as outlined in the perchlorate proposals. Furthermore,
perchlorate does not occur with sufficient frequency, at levels of public health concern, as compared with previous NPDWRs, to warrant regulation.\textsuperscript{255}

Ultimately, safe drinking water is something everyone, at every level of government and regardless of political affiliation, can get behind.\textsuperscript{256} To bring the policy and the legal limits of authority in line with one another, the SDWA should be revised to be more objective and have a solid, principled framework for the use of scientific studies in determining which contaminants are ripe for regulation and at what level to set those limits.\textsuperscript{257} The focus of such revisions ought to be addressing the federalist concerns by instituting vertical limits, such that the federal power may only come into play if a threshold number of States and systems would be affected, and on ensuring that the scientific community receives due deference from the regulators.\textsuperscript{258}

\textsuperscript{255} See Table 4, infra note 304 for a look at how frequently and at what levels perchlorate actually occurs.


\textsuperscript{257} See infra Part III.C for a discussion of the public policy objective of the SDWA and how to reform the statute to achieve that goal and comply with constitutional limitations.

\textsuperscript{258} See infra Part III.C.3 for a discussion of how the statute should be revised to handle the vertical separation of powers.
A. Congress Lacked the Authority to Enact the SDWA

The SDWA purports to exercise Commerce Clause authority, teamed with the Necessary and Proper Clause, to regulate all PWSs.\textsuperscript{259} Commerce Clause authority is limited by the federalist principles of the Tenth Amendment.\textsuperscript{260} The SDWA thus goes beyond the pale of congressional authority.

1. The Commerce Clause Argument

The argument in favor of finding the SDWA constitutional rests on Commerce Clause authority.\textsuperscript{261} However, many PWSs do not sell across state lines, or sell water at all, and are purely local in nature.\textsuperscript{262} The Commerce Clause as a justification for the SDWA still fails because of limitations imposed by the police power.\textsuperscript{263}

As clearly articulated by the Supreme Court, Congress may, under Commerce Clause authority, regulate the channels of interstate commerce, the instrumentalities of interstate commerce, and “those activities having a substantial relation to interstate commerce.”\textsuperscript{264} When the petitioners in \textit{Nebraska} challenged the constitutionality of the SDWA, the EPA directed the

\textsuperscript{259} Nebraska v. EPA, 331 F.3d 995, 998 (D.C. Cir. 2003).
\textsuperscript{260} See \textit{supra} Part II.C.3 for a discussion of how the Tenth Amendment operates and limits congressional authority.
\textsuperscript{261} See, e.g., \textit{Nebraska}, 331 F.3d at 998 (D.C. Cir. 2003).
\textsuperscript{262} \textit{See Drinking Water Factoids: Drinking Water & Ground Water Statistics for 2004}, EPA (2004), http://www.epa.gov/safewater/data/pdfs/data_factoids_2004.pdf (discussing transient non-community water systems and non-transient non-community water systems, such as public gas stations). As an interesting aside, Garrett Johnson notes in his article that Congress may only regulate purely local activity when the overall federal scheme would be undermined without regulating the local activity. Johnson, \textit{supra} note 243, at 98. In order to pull local activity within the ambit of the overall federal scheme, Congress would have to show that a “total incidence” of the activity threatens the national market. \textit{Id.} (quoting Gonzales v. Raich, 545 U.S. 1, 18 (2005)).
\textsuperscript{263} See \textit{infra} Part III.A.2 for a discussion of how Commerce Clause authority is limited by the Tenth Amendment.
\textsuperscript{264} United States v. Lopez, 514 U.S. 549, 558–59 (1995). See \textit{supra} Part II.C.1 for a discussion of Commerce Clause authority, how it has developed, and how it operates.
court to several large PWSs that sell water across state lines. Sale of drinking water across state lines makes drinking water a thing involved in, or moving in, interstate commerce. With some drinking water moving in interstate commerce, drinking water sold purely intrastate takes on the character of the third classification—activities having a substantial relation to interstate commerce. Therefore, the argument goes, the SDWA is a proper exercise of congressional authority under the Commerce Clause to regulate the sale of drinking water.

However, this argument applies only to PWSs that sell water. In the text of the SDWA, the drafters clearly recognized that federal authority to regulate contaminants in drinking water could not extend to the use of private wells or the sale of water by a “system” with fewer than twenty-five regular customers or fewer than fifteen connections. More than fifteen million households in the United States regularly rely on private wells for drinking water. It remains unclear how many individuals regularly use well water, but the number of household well users is approximately fifteen percent that of PWS users. Fifteen percent of the market in groundwater opting out of the commercial market could arguably rise to the level of having a substantial effect on interstate commerce.

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265 Nebraska, 331 F.3d at 998.
266 See supra text accompanying note 164 for a discussion of the authority to render drinking water, sold across state lines, a thing moving in interstate commerce.
267 See supra notes 165–72 and accompanying text for a discussion of how the Commerce Clause operates with regard to this third category of interstate commerce.
268 See Nebraska, 331 F.3d at 998 (upholding the SDWA on Commerce Clause grounds because some PWSs sell across state lines).
271 Id.
In order to regulate all PWSs, the Commerce Clause authority is teamed with the Necessary and Proper Clause, such that Congress would be using reasonable means to achieve an appropriate goal. The problem here is that the SDWA does not regulate the sale of drinking water at all. The regulation is not economic in nature, but rather one that aims to protect the public health, a sphere generally reserved to the states and an inappropriate realm of congressional regulation.

2. The Tenth Amendment, Cabined Authority, and Non-Economic Regulation

No scholarship exists, and no court has thoroughly treated, the potential Tenth Amendment challenges to the SDWA, or how federalist principles bear on and limit Commerce Clause authority with regard to legislation and regulation that involves specific governance under the police power. The police power, a power reserved explicitly to the States, traditionally includes the power to regulate for the protection of public health and safety within a State’s territory.

The SDWA, explicitly designed to authorize federal regulation for protection of the public health, runs headlong into the federalist principles of the Tenth Amendment and the police power. As the Tenth Amendment is exactly that—an Amendment that modifies the entire foregoing constitution, including the Article I Commerce Clause—congressional authority under

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273 See supra Part II.C.2 for a discussion of the Necessary and Proper Clause.
274 See supra notes 199–200 and accompanying text for a brief discussion of how and why the police power, including regulation for the public health, has been reserved to the states.
275 See supra Part II.D for a discussion of the relevant case law and scholarship related to the SDWA.
276 See supra notes 198–203 for a discussion of the police power.
the Commerce Clause is limited by federalist principles.\textsuperscript{279} Furthermore, Commerce Clause authority has been limited by federalist principles by the Supreme Court when it noted that “[e]ven . . . modern-era precedents which have expanded congressional power under the Commerce Clause confirm that this power is subject to outer limits.”\textsuperscript{280}

Perhaps more to the point, the SDWA is not an economic regulation at all. It does not regulate the sale of anything.\textsuperscript{281} Regulation for the public health falls within the ambit of the police power, an unenumerated realm of the powers reserved to the States by the Tenth Amendment.\textsuperscript{282}

For the above reasons, that the Commerce Clause is limited by federalist principles, and the SDWA does not regulate economic activity of any kind, the SDWA is beyond the scope of congressional authority and therefore unconstitutional. Even if the SDWA itself is a proper exercise of congressional authority, the proposed perchlorate regulation still goes outside the grant of statutory authority.

B. Perchlorate Regulation is Improper

The constitutionality of the SDWA is not on the firmest ground, but regardless, the proposed perchlorate regulation fails to meet statutory requirements. The administrative history

\textsuperscript{279} See \textit{supra} Part II.C.3 for a discussion of the Tenth Amendment and its limiting principles. See also \textit{The ACA}, 132. S. Ct. 2566, 2591 (2012), placing a check on congressional exercise of the Commerce Clause.


\textsuperscript{281} See 42 U.S.C.A. §§ 300f–300j-26 (West, Westlaw through Dec. 7, 2012) (regulating the PWSs, but failing to specify that system must sell water).

\textsuperscript{282} See \textit{supra} notes 198–203 for a discussion of the police power and its reservation to the states.
of perchlorate regulation evinces the arbitrary and capricious nature of this regulation under the statute.\textsuperscript{283}

There are two main issues with the current perchlorate regulation proceedings and the precedential value that such regulation will carry. First, the use of a biochemical “precursor event,” as opposed to the “adverse health effect” required by the SDWA, sets a less rigorous regulatory precedent and does not conform to statutory requirements.\textsuperscript{284} Second, the EPA seems to have changed its mind as to what constitutes perchlorate occurrence with sufficient frequency and at levels of public health concern, and this shifting definition is unsupported by the UCMR data or the health advisory levels.\textsuperscript{285}

1. No Precedent or Authority to Regulate Based on Precursor Events

There exists no precedent for regulating or drafting an MCL based on biological precursor events. In Federal Register notices and discussions, the EPA consistently addresses the...
question: “May [this contaminant] have an adverse effect on the health of persons?”286 A search of www.regulations.gov (the online address for the Federal Register) reveals that the EPA has used the term “precursor event” in three publications: two involving perchlorate, and once in a 1998 Notice discussing water quality criteria with regard to carcinogens.287 Current NPDWRs deal exclusively with adverse effects on human health.288

The SDWA specifically requires the EPA Administrator to find a contaminant may have an adverse effect on human health for proper regulation.289 Promulgating regulation predicated on a precursor event, as opposed to an adverse health effect, would, if upheld, give the EPA precedential authority to regulate any contaminant based on precursor events.290 With regard to endocrine disruptors and goitrogens, such as perchlorate, the life stages analysis proposed by the EPA presents an equally slippery precedential slope.291 This approach to perchlorate regulation, using the statistical presence of a biological precursor event, as opposed to the existence of an

289 § 300g-1(b)(1)(A)(i).
290 Supposing such a regulation were never challenged, the EPA would still be able to cite to the previously unchallenged use of precursor events as precedent for future regulations.
291 In its announcement of a decision to regulate perchlorate, the EPA cited to the National Research Council’s identification of fourteen distinct life stages, or age groups, that present different and unique needs and concerns with regard to perchlorate consumption. Drinking Water: Regulatory Determination on Perchlorate, 76 Fed. Reg. 7762, 7764 (Feb. 11, 2011). A life stages analysis sets a different health reference level and reference dose for each age group, based on average consumption for individuals in each stage. Id. The idea is to determine the most at-risk population and then establish a level protective of the ninetieth percentile rate of consumption for that age group.
adverse health effect, renders such regulation out of compliance with the SDWA and beyond the grant of statutory authority.\textsuperscript{292} Perchlorate regulation, as proposed, lacks precedential or statutory authority and is improper under the SDWA.

2. Perchlorate Occurrence and Levels of Public Health Concern

Application of the occurrence requirement to perchlorate regulation has been, at best, inconsistent and requires revision to implement a clear, concise, principled method to evaluate whether perchlorate is sufficiently prevalent in PWSs to warrant regulation.

In the 2008 preliminary determination to not regulate perchlorate and the 2011 regulatory determination, the EPA used data from UCMR 1 to justify its decision.\textsuperscript{293} Clearly, the data has not changed.\textsuperscript{294} The 2008 determination used a health reference level of fifteen micrograms per liter, but in August 2009, the EPA proposed alternative health reference levels for fourteen life stages.\textsuperscript{295} These levels ranged from one microgram per liter to forty-seven micrograms per liter.\textsuperscript{296}

UCMR 1 contained a minimum reporting level of four parts per billion, or four micrograms per liter.\textsuperscript{297} Of more than 150,000 PWSs in the United States,\textsuperscript{298} UCMR 1 analyzed

\begin{thebibliography}{99}
\bibitem{292} M.A. Greer, G. Goodman, R.C. Pleuss, and S.E. Greer, \textit{Health Effect Assessment for Environmental Perchlorate Contamination: The Dose Response for Inhibition of Thyroidal Radioiodine Uptake in Humans}, 110 ENVTL. HEALTH PERSPECTIVES 927, 931 (2002).
\bibitem{294} See \textit{supra} notes 129–36 and 141–42, as well as the accompanying text, for a discussion of how the view of perchlorate’s occurrence has changed over time.
\bibitem{296} 76 Fed. Reg. at 7764.
\bibitem{297} \textit{See Occurrence Data: Accessing Unregulated Contaminant Monitoring Data, supra} note 52.
\end{thebibliography}
data on perchlorate from 3,865 systems between 2001 and 2005. 160 of the 3,865 systems test, roughly four percent, had at least one analytical detection of perchlorate at level greater than or equal to the minimum reporting level of four parts per billion. Less than two percent of the more than thirty four thousand samples collected contained perchlorate concentrations at or above the minimum reporting level. The average and median perchlorate concentrations, for those samples with positive detections, were 9.85 micrograms per liter and 6.40 micrograms per liter, respectively. While not a particularly widespread contaminant, perchlorate also does not impact a large swath of the population.

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299 76 Fed. Reg. at 7764; see Occurrence Data: Accessing Unregulated Contaminant Monitoring Data, supra note 52.
300 Occurrence Data: Accessing Unregulated Contaminant Monitoring Data, supra note 52.
301 Id.

**Table 3 – UCMR 1 Occurrence of Perchlorate at Concentrations Greater Than or Equal To Four Micrograms per Liter**

<table>
<thead>
<tr>
<th></th>
<th># of samples</th>
<th>Samples w/ detects</th>
<th>Sampling points tested</th>
<th>Sampling points w/ detects</th>
<th>Sampled systems</th>
<th>Systems w/ detects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Systems</td>
<td>3,295</td>
<td>15</td>
<td>1,454</td>
<td>8</td>
<td>797</td>
<td>8</td>
</tr>
<tr>
<td>Large Systems</td>
<td>31,036</td>
<td>622</td>
<td>13,533</td>
<td>379</td>
<td>3,068</td>
<td>152</td>
</tr>
<tr>
<td>Total Systems</td>
<td>34,331</td>
<td>637</td>
<td>14,987</td>
<td>387</td>
<td>3,865</td>
<td>160</td>
</tr>
</tbody>
</table>

*Id.*


**Table 4 – Percent PWS Estimates for Perchlorate Above Thresholds of Interest**

<table>
<thead>
<tr>
<th>Threshold Concentration</th>
<th>PWSs w/ at least 1 detection &gt; threshold of interest</th>
<th>PWS entry or sample points w/ at least 1 detection &gt; threshold of interest</th>
<th>Range of population (millions) served by PWSs w/ at least 1 detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 μg/L</td>
<td>155 (4.0%)</td>
<td>371 (2.5%)</td>
<td>5.1 – 16.6</td>
</tr>
<tr>
<td>5 μg/L</td>
<td>122 (3.16%)</td>
<td>281 (1.88%)</td>
<td>14.6</td>
</tr>
<tr>
<td>6 μg/L</td>
<td>97 (2.5%)</td>
<td>219 (1.5%)</td>
<td>3.0 – 11.8</td>
</tr>
</tbody>
</table>
Even at the 2006 guidance level of 24.5 parts per billion, at most 0.39% of PWSs and 0.33% of entry points would have perchlorate concentrations above the recommended level, already determined to be adequately protective of public health.\textsuperscript{304} Further, the 2008 health reference level was set at fifteen parts per billion and was determined to be protective of pregnant women, the most at-risk population, to a factor of ten.\textsuperscript{305} At this level, 0.80% of PWSs and 0.29% of entry points have perchlorate concentrations above the protective level.\textsuperscript{306}

The steadily decreasing reference dose, incredibly small number of affected systems and populations, and lack of additional scientific evidence supporting a regulation, suggest that perchlorate does not occur frequently or at levels of public health concern and is therefore regulation would not be a proper exercise of statutory authority. Despite the fact that perchlorate itself is not a proper subject for regulation under the SDWA, the overall aim of the statute—protecting and promoting public health—should be encouraged through other methods.

<table>
<thead>
<tr>
<th>μg/L</th>
<th>Systems</th>
<th>Population Estimates</th>
<th>Reference</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>82 (2.12%)</td>
<td>171 (1.14%)</td>
<td>7.2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>56 (1.5%)</td>
<td>115 (0.77%)</td>
<td>1.6 – 5.2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>52 (1.35%)</td>
<td>97 (0.65%)</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>42 (1.09%)</td>
<td>63 (0.42%)</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>36 (0.93%)</td>
<td>56 (0.37%)</td>
<td>No data</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>33 (0.85%)</td>
<td>48 (0.32%)</td>
<td>0.9 – 2.1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>31 (0.80%)</td>
<td>44 (0.29%)</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>27 (0.70%)</td>
<td>36 (0.24%)</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>24 (0.62%)</td>
<td>30 (0.20%)</td>
<td>0.7 – 1.6</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>19 (0.49%)</td>
<td>24 (0.16%)</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>15 (0.39%)</td>
<td>19 (0.13%)</td>
<td>0.4 – 1.0</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>14 (0.36%)</td>
<td>18 (0.12%)</td>
<td>1.0</td>
<td></td>
</tr>
</tbody>
</table>

Where μg/L is micrograms per liter and population estimates are rounded. Note also that five systems presented levels at four micrograms per liter and are not presented in the table.\textsuperscript{304} See 73 Fed. Reg. at 60,265.  
\textsuperscript{305} See 74 Fed. Reg. at 41,888 (discussing the 2008 level, and noting that the No Observed Effect Level was actually 151 parts per billion).  
\textsuperscript{306} See Table 4, supra note 303.
C. Reconciling Authority and Public Policy

Legal authority and the public policy behind the SDWA can be brought together with a little effort. Issues with the constitutionality of the SDWA and the propriety of proposed perchlorate regulations aside, safe drinking water is something everyone wants.\textsuperscript{307} Perchlorate regulation highlights the three main problems with the SDWA: health and public safety are state issues that should be dealt with on a state level, the statute uses vague and ambiguous language, and there is no defined procedure for consulting and incorporating scientific studies into the regulatory process.\textsuperscript{308} These three problems can be confronted head-on and can be fixed without reworking the entire framework of environmental law.\textsuperscript{309}

1. Public Policy in Favor of the SDWA

In July 1974, the House Committee on Interstate and Foreign Commerce issued a report recommending the passage of the SDWA.\textsuperscript{310} The committee report included a statement of legislative purpose, and said that purpose was “for protection of public health.”\textsuperscript{311} From the House Committee in 1974, to the United Nations Children’s Fund,\textsuperscript{312} to sitting Congressman.\textsuperscript{313}

\begin{footnotesize}
\textsuperscript{307} See infra Part III.C.1 for a discussion of the public policy in favor of the SDWA.
\textsuperscript{308} See supra Part III.B for a discussion of the problems with regulating perchlorate.
\textsuperscript{309} See infra Part III.C.3 for suggestions on how the SDWA should be revised.
\textsuperscript{311} Id.
\end{footnotesize}
and conservative blog op-eds, everyone agrees that safe drinking water is important and makes for good public policy.

Where the ends are surely sound, the means—the SDWA—not only go beyond the limits of congressional authority, but also have serious problems in the current incarnation. The SDWA has problems built into the statute that require reconsideration and revision to bring the policy objectives in step with the limits of legal authority.

2. Problems with the Statutory Language

Three main issues within the text of the SDWA necessitate revision. First, while the purpose of the NPDWRs is to protect and promote the public health, these aims are part of the police power traditionally reserved to the States, and unsupervised encroachment by the EPA raises significant issues of federalism. Second, the statute is vague: the three requirements for regulation are inadequately defined and lead to uncertainty and unpredictability in the regulatory process. Finally, while the SDWA requires the EPA Administrator to consult scientific studies and authority, there remains no standard for how much weight should be lent to those authorities or how the information should be incorporated in the regulatory process.

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316 See supra Part III.A for a discussion of the constitutional problems with the SDWA.
317 See infra Part III.C.2 for a discussion of the problems with the statutory language of the SDWA.
The police power allows States to regulate for the protection of public health.\textsuperscript{318} State and local governments are obviously in greater proximity to their populations and thus better positioned to evaluate local needs and problems.\textsuperscript{319} These localized governments are in the best position to evaluate the quality of their source waters, the relative risk various contaminants pose to their populations, and the most efficient balancing of costs and benefits.\textsuperscript{320}

Regulations that have a direct and substantial effect on the States, the distribution of power and responsibilities amongst the levels of governments, or the relationship between the federal and state governments, implicates federalism.\textsuperscript{321} NPDWRs promulgated under the SDWA require State monitoring and enforcement, and therefore have a direct and substantial effect on the States.\textsuperscript{322} These regulations therefore have federalist implications that need to be addressed in the statute.

The SDWA does not adequately address or codify a process by which to evaluate the direct impact on States or incorporate States into the regulatory process to ensure harmony between the levels of government.\textsuperscript{323} Silence on this issue requires the SDWA to be reconsidered and amended.

\textsuperscript{318} See \textit{supra} notes 191–200 for a discussion of the police power and regulating for the public health.


\textsuperscript{320} See \textit{Bond} v. United States, 131 S. Ct. 2355, 2364 (2011) (stating that the “federal structure allows local policies ‘more sensitive to the diverse needs of a heterogeneous society’ . . . [and] enables greater citizen ‘involvement in democratic processes,’ [that] make[] government ‘more responsive’” (quoting Gregory v. Ashcroft, 501 U.S. 452, 458 (1991))).

\textsuperscript{321} \textit{Id.}

\textsuperscript{322} See \textit{supra} note 43 for a brief discussion of enforcement responsibilities.

\textsuperscript{323} See 42 U.S.C.A. §§ 300f–300j-26 (West, Westlaw through Dec. 7, 2012) (lacking any language requiring the Administrator to \textit{use} the information he or she obtains from consultation with scientific community).
The statute also suffers from impermissible vagueness.\textsuperscript{324} Nowhere in the SDWA or attendant regulations are the terms “adverse effect on human health,” “sufficient frequency,” or “levels of public health concern” defined.\textsuperscript{325} Additionally, the statute and regulations provide no method for stakeholders and interested parties to reasonably foresee regulation based on external and objective factors.

While Congress may reasonably include a degree of vagueness in statutory drafting to allow designated agencies and subject-matter experts to use their skills to achieve congressional objectives, overbreadth deprives States and interested parties the opportunity to foresee regulation and self-police their activities. The requirement for an Administrator to find that a contaminant may have an adverse effect on the health of persons before promulgating regulation is highly subjective.\textsuperscript{326} This prong includes no threshold definition of “adverse effect” or any method of evaluating or incorporating peer-reviewed science.\textsuperscript{327} Additionally, regulation based on previously unused and undefined markers, such as precursor events and life stage analyses, looks more like a search for expanded authority than an effort to fulfill the policy goal of protecting the public health in compliance with the statutory mandate.

\textsuperscript{324} See supra notes 44–59 and accompanying text for a discussion of the three prongs required for regulation and the difficulty encountered when trying to define those requirements.

\textsuperscript{325} See 42 U.S.C.A. §§ 300f–300j-26 (lacking any definition of these terms).

\textsuperscript{326} See supra notes 44–50 and accompanying text for a discussion of this prong.

\textsuperscript{327} It is important to remember that the statutory definition for a contaminant, with regard to drinking water, is literally anything other than H2O. 42 U.S.C.A. § 300f(6). A quick perusal of the Cancer Research UK website shows the broad spectrum of things that could cause cancer: age, lifestyle, DNA damage, carcinogens, inherited gene faults, viruses, problems with the immune system, etc. What Causes Cancer?, CANCER RESEARCH UK, http://info.cancerresearchuk.org/cancerandresearch/all-about-cancer/what-is-cancer/what-causes-cancer/what-causes-cancer2 (last visited Aug. 9, 2012). Using this list as an example, without narrowing the definition of “adverse health effect,” almost anything that could occur in drinking water, other than pure water, would be subject to federal regulation under the SDWA.
The second requirement, that a contaminant occur with sufficient frequency at levels of public health concern,\textsuperscript{328} lacks objective definition. The EPA uses UCMR data and information from the National Inorganic Radionuclide Survey to evaluate contaminant occurrence and exposure.\textsuperscript{329} While these data sources are readily accessible to the public, they provide no guidance as to what constitutes “sufficient occurrence” of a contaminant that will trigger federal regulation. A related issue, what constitutes occurrence at a level of public health concern,\textsuperscript{330} remains equally undefined.

The final prong, requiring the Administrator to find that regulating a contaminant presents a “meaningful opportunity to reduce public health risks,”\textsuperscript{331} is the most problematic. This finding, which is not subject to judicial review,\textsuperscript{332} bears no external evaluation or review any kind. It does not encourage effective and efficient governance, but rather encourages, at a minimum, the perception of over-regulation at best and politicized regulation at worst. The requirement is arbitrary and capricious because it neither requires expert opinion or scientific evidence nor allows for objective review of the determination.

Finally, the SDWA offers no guidance on how the EPA Administrator is to use scientific information.\textsuperscript{333} Multiple sections of the statute require the Administrator to consult with

\textsuperscript{328} See supra notes 51–56 for a discussion of this requirement.
\textsuperscript{330} See supra Part III.B.2 for a discussion of occurrence and levels of public health concern as they relate to perchlorate, and how the definition has changed over time.
\textsuperscript{331} See supra notes 57–59 for a discussion of this requirement.
\textsuperscript{332} See supra note 43 for a discussion of the limited judicial review under the SDWA, and why it is not the focus of this Comment.
\textsuperscript{333} The statute does require the Administrator to consult with the scientific community, but makes no mention as to how that information should be used.
scientists and scientific data\textsuperscript{334} or require that studies used in the decision making process be peer-reviewed and conducted according to objective principles.\textsuperscript{335} However, the SDWA makes no mention as to how the information should be used or the relative weight it ought to be accorded in the regulatory process.\textsuperscript{336} Regulation based on adverse health effects, occurrence data, and levels of public health concern, necessarily involves intensive scientific valuations.

The SDWA has serious problems written into the statute. These problems decrease efficiency, clarity, and transparency in the regulatory process, and discourage reasonably responsible behavior by PWSs by decreasing the predictability of future regulation. For the foregoing reasons, the SDWA should be reconsidered and revised to promote clarity, transparency, efficiency, and predictability in the regulatory process.

3. Revising the SDWA

Three major issues relating to the SDWA and regulatory promulgation should be considered for revision: federalism concerns; clarity and transparency of the regulatory process; and the approach to using scientific studies and principles in developing NPDWRs. The key in revising the SDWA will be focusing on the introduction of a standard approach to using scientific studies, principles, and findings when making regulatory determinations and promulgating NPDWRs.

Revisions revolving around federalism should focus on denying the EPA authority to regulate when fewer than, for example, fifteen or twenty States would be affected by a given regulation. States like Massachusetts and California have elected to self-regulate contaminants

\textsuperscript{335} See, e.g., id. at § 300g-1(b)(3)(A).
\textsuperscript{336} See supra note 333.
like perchlorate before the federal government ever gets involved.\textsuperscript{337} Rather than occupying the field of drinking water regulation, Congress should build into the SDWA provisions encouraging States to self-regulate and provide matching cleanup funds or decreased interest rates to facilitate necessary capital improvements.

To promote clarity, objectivity, and transparency in the regulatory process, Congress or the EPA needs to clarify definitions for “adverse health effect,” “sufficiently frequent occurrence,” and “levels of public health concern.”\textsuperscript{338} Additionally, the third prong of the SDWA—allowing for regulation at the sole judgment and determination of the EPA Administrator—should be rescinded. “In the sole judgment of the Administrator” can be nothing but an entirely subjective requirement, and should be replaced with deference to the scientific community and the best available data.\textsuperscript{339}

A starting point for clarifying definitions and increasing transparency should be to codify deference to the National Research Council’s determinations for adverse health effects of a given contaminant, and allow the EPA to regulate at a factor of 0.6 of the contaminant level causing that effect. Contaminant occurrence that is sufficiently frequent to warrant federal regulation may be occurrence in at least fifteen states with a spectrum of PWSs reporting at levels of public health concern, where such level is defined as one half the reference dose.\textsuperscript{340} Replacing the

\textsuperscript{337} See 310 MASS. CODE REGS. 22.06 (codifying perchlorate regulation in Massachusetts); CAL. CODE REGS. tit. 22, § 64431 (same in California).

\textsuperscript{338} See supra notes 44–56 and accompanying text for a discussion of these requirements, and Part III.B for a discussion of the problems with perchlorate regulation, centered on these two definitions.

\textsuperscript{339} See supra notes 57–59 and accompanying text for a discussion of this prong.

\textsuperscript{340} The exact threshold for how many states or PWSs need to report contamination at levels of public health concern is an issue more appropriately covered by the legislature in conjunction with the scientific community.
subjective component of regulation dovetails nicely with increasing the role of scientific studies and deference to that community.

IV. CONCLUSION

The SDWA advances the admirable goal of providing safe drinking water across the nation. Ostensibly enacted by pairing Commerce Clause authority with the Necessary and Proper Clause, the SDWA exceeds congressional power because it does not bear on interstate commerce but rather intrastate activity that ought to be regulated by the States.341 The police power reserved to the States includes the authority to regulate for the public health, which is exactly what the SDWA purports to do. In its current form, the SDWA oversteps congressional authority and runs afoul of the Tenth Amendment and is, therefore, unconstitutional.342

Furthermore, even if the SDWA is a proper exercise of congressional authority, perchlorate regulation thereunder does not comply with the statute.343 Regulating a precursor event is not the same as regulating an adverse effect.344 Perchlorate does not occur with sufficient frequency to fall under the SDWA authority.345

To comply with the law, the SDWA should be rewritten with a focus on definable thresholds and statutorily required deference to the scientific community and the National Academy of Sciences in particular.346 The revised SDWA should also contain a jurisdictional hook, such that only those PWSs involved in interstate commerce are subject to regulation or

341 See supra Part III.A for a discussion of the problems with enacting the SDWA.
342 See supra Part III.A for a more thorough articulation of this point.
343 See supra Part III.B for a discussion of why perchlorate regulation is inappropriate, even if the SDWA is constitutional.
344 See supra notes 25–26 for a brief articulation of the difference between these terms.
345 See supra notes 293–306 and accompanying text for a discussion of how infrequently perchlorate occurs.
346 See supra Part III.C.3 for a discussion of how the SDWA should be revised.
federal regulation can only be triggered when a threshold number of States experience contamination at levels of public health concern.

Arsenic regulation cost rural American households more than three hundred dollars a year, to be protected at an unnecessarily low level. We cannot afford unnecessary expansions of regulatory authority into communities that do not need it, do not want it, and are better equipped to handle the issue themselves.
GLOSSARY OF ACRONYMS

BW............................................................................................................Body Weight
CCL..............................................................................................................Contaminant Candidate List
CERCLA......Comprehensive Environmental Response, Compensation and Liability Act
DWI.................................................................Daily Water Intake
EPA...........................................................................................................Environmental Protection Agency
HRL.............................................................................................................Health Reference Level
MCL............................................................................................................Maximum Contaminant Level
MCLG.................................................................Maximum Contaminant Level Guideline
NCOD.................................................................National Contaminant Occurrence Database
NPDWR .................................................................National Primary Drinking Water Regulation
PWS .................................................................Public Water System
RfD.............................................................................................................Reference Dose
RSC...........................................................................................................Relative Source Contribution
SAB..............................................................................................................Science Advisory Board
SDWA.....................................................................................................Safe Drinking Water Act
UCMR....................................................................................................Unregulated Contaminant Monitoring Data