SUSTAINABILITY ACCOUNTING STANDARD
INFRASTRUCTURE SECTOR

WATER UTILITIES

Sustainability Accounting Standard

Sustainable Industry Classification System™ (SICS™) #IF0103
Prepared by the
Sustainability Accounting Standards Board®

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Exposure Draft Standard for Public Comment

WATER UTILITIES

Sustainability Accounting Standard

About SASB

The Sustainability Accounting Standards Board (SASB) provides sustainability accounting standards for use by publicly-listed corporations in the U.S. in disclosing material sustainability information for the benefit of investors and the public. SASB standards are designed for disclosure in mandatory filings to the Securities and Exchange Commission (SEC), such as the Form 10-K and 20-F. SASB is an independent 501(c)3 non-profit organization. Through 2016, SASB is developing standards for 78 industries in 10 sectors.

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INTRODUCTION

Purpose & Structure

This document contains the SASB Sustainability Accounting Standard (SASB Standard) for the Water Utilities industry.

SASB Sustainability Accounting Standards are comprised of **(1) disclosure guidance and (2) accounting standards on sustainability topics** for use by U.S. and foreign public companies in their annual filings (Form 10-K or 20-F) with the U.S. Securities and Exchange Commission (SEC). To the extent relevant, SASB Standards may also be applicable to other periodic mandatory filings with the SEC, such as the Form 10-Q, Form S-1, and Form 8-K.

SASB Standards identify sustainability topics at an industry level, which may constitute material information—depending on a company's specific operating context—for a company within that industry. SASB Standards are intended to provide guidance to company management, which is ultimately responsible for determining which information is material and should therefore be included in its Form 10-K or 20-F and other periodic SEC filings.

SASB Standards provide companies with standardized sustainability metrics designed to communicate performance on industry level sustainability topics. When making disclosure on sustainability topics, companies can use SASB Standards to help ensure that disclosure is standardized and therefore decision-useful, relevant, comparable, and complete.

SASB Standards are intended to constitute "suitable criteria" as defined by AT 101.23 -.32[1] and referenced in AT 701[2], as having the following attributes:

- *Objectivity*—Criteria should be free from bias.
- *Measurability*—Criteria should permit reasonably consistent measurements, qualitative or quantitative, of subject matter.
- *Completeness*—Criteria should be sufficiently complete so that those relevant factors that would alter a conclusion about subject matter are not omitted.
- *Relevance*—Criteria should be relevant to the subject matter.

Industry Description

Companies in the Water Utilities industry own and operate water supply and wastewater treatment systems or provide operational services and other specialized services to system owners. Water supply systems include the sourcing, treatment, and distribution of water to residences and businesses. Wastewater systems collect and treat wastewater, including sewage, greywater, industrial waste fluids, and storm water runoff, before discharging the resulting effluent back into the environment. Publicly listed companies in the industry include both small domestic utilities and large global players.

[1] http://pcaobus.org/Standards/Attestation/Pages/AT101.aspx
[2] http://pcaobus.org/Standards/Attestation/Pages/AT701.aspx

Guidance for Disclosure of Sustainability Topics in SEC Filings

1. Industry-Level Sustainability Topics

For the Water Utilities industry, SASB has identified the following sustainability disclosure topics:

- Energy Management
- Effluent Quality Management
- Water Scarcity
- Drinking Water Quality
- Fair Pricing & Access
- Downstream Water Efficiency
- Network Resiliency & Impacts of Climate Change

2. Company-Level Determination and Disclosure of Material Sustainability Topics

Sustainability disclosures are governed by the same laws and regulations that govern disclosures by securities issuers generally. According to the U.S. Supreme Court, a fact is material if, in the event such fact is omitted from a particular disclosure, there is "a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the 'total mix' of the information made available."[3,4]

SASB has attempted to identify those sustainability topics that are reasonably likely to have a material effect on the financial condition or operating performance of companies within each SICS industry. SASB recognizes, however, that each company is ultimately responsible for determining what information should be disclosed within the context of Regulation S-K and other guidance.

Regulation S-K, which sets forth certain disclosure requirements associated with Form 10-K and other SEC filings, requires companies, among other things, to describe in the Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A) section of Form 10-K "any known trends or uncertainties that have had or that the registrant reasonably expects will have a material favorable or unfavorable impact on net sales or revenues or income from continuing operations. If the registrant knows of events that will cause a material change in the relationship between costs and revenues (such as known future increases in costs of labor or materials or price increases or inventory adjustments), the change in the relationship shall be disclosed."

Furthermore, Instructions to Item 303 state that the MD&A "shall focus specifically on material events and uncertainties known to management that would cause reported financial information not to be necessarily indicative of future operating results or of future financial condition."[2]

The SEC has provided guidance for companies to use in determining whether a trend or uncertainty should be disclosed. The two-part assessment prescribed by the SEC, based on probability and magnitude, can be applied to the topics included within this standard:

[3] TSC Industries v. Northway, Inc., 426 U.S. 438 (1976).
[4] C.F.R. 229.303(Item 303)(a)(3)(ii).

- First, a company is not required to make disclosure about a known trend or uncertainty if its management determines that such trend or uncertainty is not reasonably likely to occur.

- Second, if a company's management cannot make a reasonable determination of the likelihood of an event or uncertainty, then disclosure is required unless management determines that a material effect on the registrant's financial condition or results of operation is not reasonably likely to occur.

3. Sustainability Accounting Standard Disclosures in Form 10-K

a. Management's Discussion and Analysis

For purposes of comparability and usability, companies should consider making disclosure on sustainability topics in the MD&A, in a sub-section titled "**Sustainability Accounting Standards Disclosures**."[5]

b. Other Relevant Sections of Form 10-K

In addition to the MD&A section, it may be relevant for companies to disclose sustainability information in other sections of Form 10-K, including, but not limited to:

- **Description of business**—Item 101 of Regulation S-K requires a company to provide a description of its business and its subsidiaries. Item 101(c)(1)(xii) expressly requires disclosure regarding certain costs of complying with environmental laws:

Appropriate disclosure also shall be made as to the material effects that compliance with Federal, State, and local provisions which have been enacted or adopted regulating the discharge of materials into the environment, or otherwise relating to the protection of the environment, may have upon the capital expenditures, earnings and competitive position of the registrant and its subsidiaries.

- **Legal proceedings**—Item 103 of Regulation S-K requires companies to describe briefly any material pending or contemplated legal proceedings. Instructions to Item 103 provide specific disclosure requirements for administrative or judicial proceedings arising from laws and regulations that target discharge of materials into the environment or that are primarily for the purpose of protecting the environment.

- **Risk factors**—Item 503(c) of Regulation S-K requires filing companies to provide a discussion of the most significant factors that make an investment in the registrant speculative or risky, clearly stating the risk and specifying how a particular risk affects the particular filing company.

c. Rule 12b-20

Securities Act Rule 408 and Exchange Act Rule 12b-20 require a registrant to disclose, in addition to the information expressly required by law or regulation, "such further material information, if any, as may be

[5] SEC [Release Nos. 33-8056; 34-45321; FR-61] Commission Statement about Management's Discussion and Analysis of Financial Condition and Results of Operations: "We also want to remind registrants that disclosure must be both useful and understandable. That is, management should provide the most relevant information and provide it using language and formats that investors can be expected to understand. Registrants should be aware also that investors will often find information relating to a particular matter more meaningful if it is disclosed in a single location, rather than presented in a fragmented manner throughout the filing."

necessary to make the required statements, in light of the circumstances under which they are made, not misleading."

More detailed guidance on disclosure of sustainability topics can be found in the **SASB Conceptual Framework**, available for download via http://www.sasb.org/approach/conceptual-framework/.

Guidance on Accounting for Sustainability Topics

For each sustainability topic included in the Water Utilities industry Sustainability Accounting Standard, SASB identifies accounting metrics.

SASB recommends that each company consider using these sustainability accounting metrics when preparing disclosures on the sustainability topics identified herein;

As appropriate—and consistent with Rule 12b-20[6]—when disclosing a sustainability topic identified by this Standard, companies should consider including a narrative description of any material factors necessary to ensure completeness, accuracy, and comparability of the data reported. Where not addressed by the specific accounting metrics, but relevant, the registrant should discuss the following, related to the topic:

- The registrant's **strategic approach** to managing performance on material sustainability issues;
- The registrant's **relative performance** with respect to its peers;
- The **degree of control** the registrant has;
- Any **measures the registrant has undertaken** or **plans to undertake** to improve performance; and
- Data for the registrant's **last three completed fiscal years** (when available).

SASB recommends that registrants use SASB Standards specific to their primary industry as identified in the Sustainable Industry Classification System (SICS™). If a registrant generates significant revenue from multiple industries, SASB recommends that it also consider sustainability topics that SASB has identified for those industries and disclose the associated SASB accounting metrics.

In disclosing to SASB Standards, it is expected that registrants disclose with the same level of rigor, accuracy, and responsibility as they apply to all other information contained in their SEC filings.

Users of the SASB Standards

The SASB Standards are intended to provide guidance for companies that engage in public offerings of securities registered under the Securities Act of 1933 (the Securities Act) and those that issue securities registered under the

[6] SEC Rule 12b-20: "In addition to the information expressly required to be included in a statement or report, there shall be added such further material information, if any, as may be necessary to make the required statements, in the light of the circumstances under which they are made, not misleading."

Securities Exchange Act of 1934 (the Exchange Act),[7] for use in SEC filings, including, without limitation, annual reports on Form 10-K (Form 20-F for foreign issuers), quarterly reports on Form 10-Q, current reports on Form 8-K, and registration statements on Forms S-1 and S-3. Disclosure with respect to the SASB Standards is not required or endorsed by the SEC or other entities governing financial reporting, such as FASB, GASB, or IASB.

Scope of Disclosure

Unless otherwise specified, SASB recommends:

- That a registrant disclose on sustainability issues and metrics for itself and for entities that are consolidated for financial reporting purposes as defined by accounting principles generally accepted in the United States for consistency with other accompanying information within SEC filings;[8]
- That for consolidated entities, disclosures be made, and accounting metrics calculated, for the whole entity, regardless of the size of the minority interest; and
- That information from unconsolidated entities not be included in the computation of SASB accounting metrics. A registrant should disclose, however, information about unconsolidated entities to the extent that the registrant considers the information necessary for investors to understand the effect of sustainability topics on the company's financial condition or operating performance (typically, this disclosure would be limited to risks and opportunities associated with these entities).

Reporting Format

Use of Financial Data

In instances where accounting metrics, activity metrics, and technical protocols in this standard incorporate financial data (e.g., revenues, cost of sales, expenses recorded and disclosed for fines, etc.), such financial data shall be prepared in accordance with the accounting principles generally accepted in the United States of America ("US GAAP") and be consistent with the corresponding financial data reported within the registrant's SEC filings. Should accounting metrics, activity metrics and technical protocols in this standard incorporate disclosure of financial data that is not prepared in accordance with US GAAP, the registrant shall disclose such information in accordance with the SEC Regulation G.

Activity Metrics and Normalization

SASB recognizes that normalizing accounting metrics is important for the analysis of SASB disclosures.

[7] Registration under the Securities Exchange Act of 1934 is required (1) for securities to be listed on a national securities exchange such as the New York Stock Exchange, the NYSE Amex, and the NASDAQ Stock Market or (2) if (A) the securities are equity securities and are held by more than 2,000 persons (or 500 persons who are not accredited investors) and (B) the company has more than $10 million in assets.
[8] See US GAAP consolidation rules (Section 810).

SASB recommends that a registrant disclose any basic business data that may assist in the accurate evaluation and comparability of disclosure, to the extent that they are not already disclosed in the Form 10-K (e.g., revenue, EBITDA, etc.).

Such data—termed "activity metrics"—may include high-level business data such as total number of employees, quantity of products produced or services provided, number of facilities, or number of customers. It may also include industry-specific data such as plant capacity utilization (e.g., for specialty chemical companies), number of transactions (e.g., for Internet media and services companies), hospital bed days (e.g., for health care delivery companies), or proven and probable reserves (e.g., for oil and gas exploration and production companies).

Activity metrics disclosed should:

- Convey contextual information that would not otherwise be apparent from SASB accounting metrics.
- Be deemed generally useful for an investor relying on SASB accounting metrics in performing their own calculations and creating their own ratios.
- Be explained and consistently disclosed from period to period to the extent they continue to be relevant. However, a decision to make a voluntary disclosure in one period does not obligate a continuation of that disclosure if it is no longer relevant or if a better metric becomes available.[9]

Where relevant, SASB recommends specific activity metrics that—at a minimum—should accompany SASB accounting metric disclosures.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Population served	Quantitative	Number	IF0103-A
Volume of water delivered and percentage sourced from a third party[10]	Quantitative	Cubic meters (m^3), Percentage (%)	IF0103-B
Volume of wastewater treated	Quantitative	Cubic meters (m^3)	IF0103-C
Length of transportation and distribution lines	Quantitative	Kilometers (km)	IF0103-D

Units of Measure

Unless specified, disclosures should be reported in International System of Units (SI units).

Uncertainty

SASB recognizes that there may be inherent uncertainty when disclosing certain sustainability data and information. This may be related to variables such as the reliance on data from third-party reporting systems and technologies,

[9] *Improving Business Reporting: Insights into Enhancing Voluntary Disclosures*, FASB Business Reporting Research Project, January 29, 2001.
[10] Note to **IF0103-B**—The amount of water delivered includes drinking water, industrial process water, and recycled water.

or the unpredictable nature of climate events. Where uncertainty around a particular disclosure exists, SASB recommends that the registrant should consider discussing its nature and likelihood.

Estimates

SASB recognizes that scientifically based estimates, such as the reliance on certain conversion factors or the exclusion of *de minimis* values, may occur for certain quantitative disclosures. Where appropriate, SASB does not discourage the use of such estimates. When using an estimate for a particular disclosure, SASB expects that the registrant discuss its nature and substantiate its basis.

Timing

Unless otherwise specified, disclosure shall be for the registrant's fiscal year.

Limitations

There is no guarantee that SASB Standards address all sustainability impacts or opportunities associated with a sector, industry, or company, and therefore, a company must determine for itself the topics—sustainability-related or otherwise—that warrant discussion in its SEC filings.

Disclosure under SASB Standards is voluntary. It is not intended to replace any legal or regulatory requirements that may be applicable to user operations. Where such laws or regulations address legal or regulatory topics, disclosure under SASB Standards is not meant to supersede those requirements. Disclosure according to SASB Standards shall not be construed as demonstration of compliance with any law, regulation, or other requirement.

SASB Standards are intended to be aligned with the principles of materiality enforced by the SEC. However, SASB is not affiliated with or endorsed by the SEC or other entities governing financial reporting, such as FASB, GASB, or IASB.

Forward-looking Statements

Disclosures on sustainability topics can involve discussion of future trends and uncertainties related to the registrant's operations and financial condition, including those influenced by external variables (e.g., environmental, social, regulatory, and political). Companies making such disclosures should familiarize themselves with the safe harbor provisions of Section 27A of the Securities Act and Section 21E of the Exchange Act, which preclude civil liability for material misstatements or omissions in such statements if the registrant takes certain steps, including, among other things, identifying the disclosure as "forward-looking" and accompanying such disclosure with "meaningful cautionary statements identifying important factors that could cause actual results to differ materially from those in the forward-looking statements."

The following sections contain the disclosure guidance associated with each accounting metric such as guidance on definitions, scope, accounting, compilation, and presentation.

The term "shall" is used throughout this document to indicate those elements that reflect requirements of the Standard. The terms "should" and "may" are used to indicate guidance, which, although not required, provides a recommended means of disclosure.

Table 1. Sustainability Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	Total energy consumed, percentage grid electricity, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	IF0103-01
Effluent Quality Management	Number of incidents of non-compliance with water effluent quality permits, standards, and regulations	Quantitative	Number	IF0103-02
	Discussion of strategies to manage effluent contaminants of emerging concern	Discussion and Analysis	n/a	IF0103-03
Water Scarcity	Total fresh water sourced from regions with High or Extremely High Baseline Water Stress and percentage purchased from a third party	Quantitative	Cubic meters (m^3), Percentage (%)	IF0103-04
	Volume of recycled water delivered	Quantitative	Cubic meters (m^3)	IF0103-05
	Discussion of risks associated with the availability of water resources and description of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	IF0103-06
Drinking Water Quality	Number of (1) health-based drinking water quality violations and (2) non-health-based drinking water quality violations[11]	Quantitative	Number	IF0103-07
	Amount of legal and regulatory fines and settlements associated with drinking water contamination[12]	Quantitative	U.S. Dollars ($)	IF0103-08
	Discussion of strategies to manage drinking water contaminants of emerging concern	Discussion and Analysis	n/a	IF0103-09
Fair Pricing & Access	Number of formal customer complaints regarding pricing of and/or access to water received, percentage withdrawn	Quantitative	Number, Percentage (%)	IF0103-10
	(1) Drinking water and (2) sanitation coverage rates for population served in developing countries	Quantitative	Percentage (%) by population	IF0103-11
	Discussion of how considerations of fair pricing and access are integrated into determinations of rate structures	Discussion and Analysis	n/a	IF0103-12

[11] Note to **IF0103-07**—The registrant shall discuss notable violations such as EPA Tier 1 events, those that affected a significant number of customers, or those of extended duration.
[12] Note to **IF0103-08**—The registrant shall briefly describe the nature and context of the fines and settlements.

Table 1. Sustainability Disclosure Topics & Accounting Metrics (cont.)

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Downstream Water Efficiency	Water pipe replacement rate[13]	Quantitative	Rate	IF0103-13
	(1) Customer water savings from efficiency measures and (2) percentage of regulatory savings requirement achieved	Quantitative	Cubic meters (m^3), Percentage (%)	IF0103-14
	Volume of non-revenue real water losses	Quantitative	Cubic meters (m^3)	IF0103-15
Network Resiliency & Impacts of Climate Change	Water treatment capacity located in FEMA Special Flood Hazard Areas or foreign equivalent	Quantitative	Cubic meters (m^3) per day	IF0103-16
	Volume of sanitary sewer overflows, percentage recovered	Quantitative	Cubic meters (m^3), Percentage (%)	IF0103-17
	(1) Number of service interruptions, (2) population affected, and (3) average duration[14]	Quantitative	Number, Minutes	IF0103-18
	Discussion of efforts to identify and manage risks and opportunities related to the impact of climate change on distribution network	Discussion and Analysis	n/a	IF0103-19

[13] Note to **IF0103-13**—The registrant shall discuss its strategies and challenges regarding the replacement of water pipes.

[14] Note to **IF0103-18**— The registrant shall discuss notable service interruptions such as those that affected a significant population or those of extended duration.

Energy Management

Description

Companies in the Water Utilities industry require significant energy inputs throughout the value chain to deliver usable water to the end customer or provide wastewater services. Raw water extraction, conveyance, treatment, and distribution are all energy-intensive activities that are critical components of the industry's value-adding services. The energy intensity of water utilities is likely to increase in the future as water tables fall. Alternative treatment of water, such as recycling and desalination, can also require more energy. Purchased grid electricity is the most common energy input, with on-site generation occurring in more remote locations to power equipment and backup systems. Electricity purchases from the grid create environmental concerns, such as indirect impacts on climate through Scope 2 emissions. Efficient energy usage is essential for competitive advantage in this industry. Together with decisions about the use of alternative fuels, renewable energy, and on-site generation of electricity, energy efficiency can play an important role in influencing both the costs and reliability of the energy supply.

Accounting Metrics

CN0103-01. Total energy consumed, percentage grid electricity, percentage renewable

.01 The registrant shall disclose total energy consumption from all sources as an aggregate figure in gigajoules or their multiples.

- The scope includes energy purchased from sources external to the organization or produced by the organization itself (self-generated).
- The scope includes only energy consumed by entities owned or controlled by the organization.
- The scope includes energy from all sources including direct fuel usage, purchased electricity, and heating, cooling, and steam energy.

.02 In calculating energy consumption from fuels and biofuels, the registrant shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).

.03 The registrant shall disclose purchased grid electricity consumption as a percentage of its total energy consumption.

.04 The registrant shall disclose renewable energy consumption as a percentage of its total energy consumption.

.05 The scope of renewable energy includes renewable fuel the registrant consumes and renewable energy the registrant directly produces, purchases through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs), or for which Green-e Energy Certified RECs are paired with grid electricity.

- For any renewable electricity generated on-site, any RECs must be retained (i.e., not sold) and retired on behalf of the registrant in order for the registrant to claim them as renewable energy.
- For renewable PPAs, the agreement must explicitly include and convey that RECs be retained and retired on behalf of the registrant in order for the registrant to claim them as renewable energy.
- The renewable portion of the electricity grid mix that is outside of the control or influence of the registrant is excluded from disclosure.[15]
- Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, consistent with U.S. Environmental Protection Agency (EPA) definitions, such as geothermal, wind, solar, hydro, and biomass.

.06 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

- Energy from hydro sources that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard.
- Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered "eligible renewables" according to the Green-e Energy National Standard Version 2.5 (2014), and materials that are eligible for a state Renewable Portfolio Standard.

.07 The registrant shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kWh to gigajoules (for energy data including electricity from solar or wind energy).

[15] SASB recognizes that RECs reflect the environmental attributes of renewable energy that have been introduced to the grid.

Effluent Quality Management

Description

Water and wastewater treatment facilities produce effluent, or discharge, that poses environmental risks. Effluent includes residuals and solids that consist of chemicals used in the treatment process and contaminants removed from raw water or wastewater inputs. Effluent is discharged from treatment facilities into surface water, including oceans, rivers, and lakes, or pumped into groundwater. Environmental risks vary depending on the treatment process, but generally, proper treatment and disposal should mitigate threats to ecosystems and human health. An emerging issue is the presence of endocrine-disrupting chemicals, which wastewater treatment facilities are not typically designed to address. Thus the chemicals may still be present in effluent when it is discharged back into the environment. As public and regulatory scrutiny on effluent quality increases, companies will need to innovate and ensure that effluent released is not harmful to the environment or human health. In addition, extreme weather events like flooding can lead to overflow of wastewater systems and release of untreated effluent. As climate change leads to a greater likelihood of extreme weather events, companies will need to improve strategic management of these risks. The realization of environmental risks, such as exceeding maximum discharge limits in effluent, may jeopardize a utility's community acceptance, and thus its continued social license to operate.

Accounting Metrics

IF0103-02. Number of incidents of non-compliance with water effluent quality permits, standards, and regulations

.08 The registrant shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of a quality-based standard, where:

- For purpose of this disclosure, violations of the Safe Drinking Water Act (SDWA) and violations of other drinking water quality standards shall be excluded.
- The scope of disclosure includes incidents governed by federal, state, and local statutory permits and regulations including, but not limited to, the discharge of a hazardous substance, failure to monitor wastewater effluent, and effluent limit exceedances (e.g., waste load allocation or whole effluent toxicity).

.09 An incident of non-compliance shall be disclosed regardless of whether it resulted in an enforcement action (e.g., fine, warning letter, etc.).

.10 An incident of non-compliance shall be disclosed regardless of the measurement methodology or frequency. These include violations:

- For continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly, and monthly averages.
- For non-continuous discharges, limitations that are generally expressed in terms of total mass, maximum rate of discharge, frequency, and mass or concentration of specified pollutants.

IF0103-03. Discussion of strategies to manage effluent contaminants of emerging concern

.11 The registrant shall discuss its strategy and approach to managing effluent contaminants that may be of emerging human health and/or environmental concern to the public, regulators, and/or others (e.g., non-governmental organizations, scientific researchers, etc.), where:

- Effluent contaminants of emerging concern may include, but are not limited to, those contaminants identified by the EPA in *Treating Contaminants of Emerging Concern,* such as residuals of pharmaceuticals, personal care products, flame retardants, detergents, pesticides, hormones, and other compounds including those that disrupt the endocrine system.

.12 At a minimum, the registrant shall discuss the actions it takes to assess wastewater effluents for hazard characteristics and risk traits and the treatment processes it employs to manage such hazards and risks.

.13 Relevant actions to discuss include the practices employed to determine and monitor effluents of emerging concern, including a discussion of the contaminants of emerging concern in the effluent stream that are currently being monitored and any thresholds the registrant may have developed for acceptable concentrations of such effluents.

.14 Relevant wastewater treatment processes include, but are not limited to, conventional wastewater treatment and advanced wastewater treatment technologies such as granular activated carbon, ozonation, advanced oxidation, membrane treatment, and/or investments in research and development of treatment technologies or methods for emerging contaminants.

.15 The registrant shall discuss the risks and/or opportunities associated with the potential for emerging contaminants to come under effluent regulations.

- Relevant information to provide includes, but is not limited to:
  - Identification of the emerging contaminants most likely to come under regulation;
  - Current ability to treat and/or manage such contaminants; and
  - Risks (e.g., potential for fines) and opportunities (e.g., potential for infrastructure expansions to be covered by rates)

Water Scarcity

Description

Water supply systems obtain raw water from groundwater or surface water sources. Such water supplies may either be accessed directly or purchased from a third party, often a government entity, through water rights. Drought conditions, overconsumption by different parties, water contamination, and ecosystem health are all factors that can jeopardize access to adequate water supplies. The increasing risk of any of these factors, such as more extreme or frequent drought conditions due to climate change, may lead to mandated water restrictions. Such restrictions may be implemented at the water supply system level and/or at the user level. The financial impacts of such restrictions may manifest in different ways, depending on rate structure, but are most likely to impact company value through decreased revenue. Water scarcity may also lead to increases in the price of purchased water, which could result in higher costs and/or revenues for companies in this industry.

Accounting Metrics

IF0103-04. Total fresh water sourced from regions with High or Extremely High Baseline Water Stress and percentage purchased from a third party

.17 The registrant shall disclose the amount of fresh water (in thousands of cubic meters) that was sourced from regions with High or Extremely High Baseline Water Stress:

- Water sources include surface water (including water from wetlands, rivers, and lakes), groundwater, or water suppled from other water utilities.
- Fresh water may be defined according to the local statutes and regulations where the registrant operates. Where there is no regulatory definition, fresh water shall be considered to be water that has a solids (TDS) concentration of less than 1000 mg/l per the Water Quality Association definition.
- Water obtained from a water utility in compliance with U.S. National Primary Drinking Water Regulations can be assumed to meet the definition of fresh water.

.18 The registrant shall analyze all of its operations for water risks and identify the amount of water sourced from locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, Aqueduct (publicly accessible online here).

.19 The registrant shall calculate the percentage of fresh water purchased from a third parties as the total amount (in thousands of cubic meters) of fresh water purchased from a third party that was sourced from regions with High or Extremely High Baseline Water Stress divided by the total amount of water sourced from regions with High or Extremely High Baseline Water Stress.

IF0103-05. Volume of recycled water delivered

.20 The registrant shall disclose the volume (in cubic meters) of water it has recycled and delivered to its customers.

.21 Recycled water shall be defined as wastewater that has been treated to meet specific water quality criteria with the intent of being used for a range of purposes, including, but not limited to:

- Potable reuse, such as direct augmentation of the drinking water supply and indirect augmentation of a drinking water source where an environmental buffer precedes drinking water treatment.
- Non-potable reuse, such as recreational landscape irrigation, agricultural reuse, industrial process reuse, and environmental reuse (e.g., wetland enhancement and groundwater recharge).

.22 The amount of recycled water delivered shall be calculated according to the state and local regulations where the recycling occurs. Examples of such regulations include, but are not limited to:

- California State Water Resources Control Board: Regulations Related to Recycled Water
- Florida Administrative Code Chapter 62-610 and Chapter 62-600
- Arizona Administrative Code Title 18, Chapter 11, Article 3: Reclaimed Water Quality Standards

.23 Where state regulations have not established criteria for wastewater recycling but where such practices are legal, recycled water shall meet the Suggested Regulatory Guidelines as set forth in Chapter 4.4.2 of the EPA's 2012 Guidelines for Water Reuse.

IF0103-06. Discussion of risks associated with the availability of water resources and description of strategies and practices to mitigate those risks

.24 The registrant shall discuss its risks associated with the availability of water resources, including a description of how it manages such risks.

.25 The registrant shall discuss, where applicable, risks to the availability of adequate, clean water sources.

- Relevant information to provide includes, but is not limited to:
  - Environmental constraints, such as water resources in water-stressed regions, drought, interannual or seasonal variability, and risks due to the impact of climate change.
  - External constraints, such as stakeholder perceptions and concerns related to water sources (e.g., those from local communities, non-governmental organizations, and regulatory agencies), restrictions to water delivery due to regulations, and constraints on the registrant's ability to obtain and retain water rights or permits.
  - How risks may vary by water source, including wetlands, rivers, lakes, oceans, groundwater, rainwater, municipal water supplies, or supply from other water utilities.

.26 The registrant shall include a discussion of the potential impacts that these risks may have on its operations and the timeline over which such risks are expected to manifest.

- Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, access to water, and reputation.

.27 The registrant shall provide a description of its short-term and long-term strategy or plans to manage these risks, including the following, where relevant:

- The scope of its strategy, plans, or targets, such as whether they pertain differently to different business units (e.g., residential versus industrial), geographies, or regulatory frameworks (e.g., rate structures, mandated water-use restrictions, etc.).

- The activities and investments established to address water sourced from areas of water stress or scarcity and any risks or limiting factors that might affect the ability to address water scarcity.

- The efforts to secure and retain reliable long-term water supplies through senior water rights, permits, and/or allocations, including the registrant's ability to secure water (e.g., through purchase from a third party) should it not be able to retain sufficient allocations.

.28 Disclosure of strategies, plans, and infrastructure investments shall be limited to activities that were ongoing (active) or reached completion during the fiscal year.

.29 The registrant shall discuss if its management of water scarcity results in any additional lifecycle impacts or tradeoffs, including tradeoffs in land use (e.g., development of water storage facilities such as reservoirs), energy consumption, and greenhouse gas (GHG) emissions, and why the registrant chose these practices despite lifecycle tradeoffs.

Additional Resources

WateReuse: State Policy and Regulations

Drinking Water Quality

Description

A core function of companies in the Water Utilities industry is to mitigate human health risks through provision of safe drinking water. Companies have a critical responsibility to ensure that water is reliably delivered to end customers and to maintain an adequate standard of quality that conforms to applicable regulations and is in line with customer expectations. In order to protect human health and safeguard company value, companies seek to protect water sources from contamination, which reduces treatment processes and costs. Comprehensive treatment processes are designed, developed, and maintained to meet water quality standards. The finished water output is routinely monitored for compliance and safety. Natural events, such as forest fires and flooding, can impact the quality of water sources as well as drinking water. As climate change increases these risks to water quality, such risks will be even more pertinent for companies to address. Challenges to water quality are even higher in developing economies. Overall, the industry invests significant resources and effort to consistently deliver safe drinking water to customers. Instances when a company fails to provide water of adequate quality to its customers may have severe consequences to its value. Such consequences may include regulatory fines, litigation, increased operating costs or capital expenditures, reputational risk, and asset or business seizure.

Accounting Metrics

IF0103-07. Number of (1) health-based drinking water quality violations and (2) non-health-based drinking water quality violations

.30 The registrant shall disclose the total number of instances of health-based drinking water non-compliance, including violations of a technology-based standard and exceedances of a quality-based standard.

.31 The scope of disclosure includes incidents governed by international, federal, state, and local statutory permits and regulations including, but not limited to, maximum contaminant level (MCL) violations, maximum residual distribution level (MRDL) violations, or treatment technique (TT) violations.

.32 Relevant regulations and permits include, but are not limited to:

- The U.S. Safe Drinking Water Act, Tier 1 and Tier 2 violations, where:
  - Tier 1 violations are defined, according to 40 CFR 141.201, as those violations of the national primary drinking water regulations (NPDWR) requiring public notice with significant potential to have serious adverse effects on human health as a result of short-term exposure.
  - Tier 2 violations are defined, according to 40 CFR 141.201, as those violations of the NPDWR requiring public notice with potential to have serious adverse effects on human health.
- The European Drinking Water Directive

.33 The registrant shall report instances of non-conformance with the World Health Organization (WHO) Guidelines for Drinking-water Quality, where drinking water quality standards do not meet the stringency set forth therein.

.34 The registrant shall disclose the total number of instances of non-health-based non-compliance, including violations of monitoring, reporting, or other non-health-based standards.

.35 The scope of disclosure includes incidents governed by international, federal, state, and local statutory permits and regulations including, but not limited to, water quality testing violations, timely reporting of water quality results, and public communication violations.

.36 Relevant regulations and permits include, but are not limited to:

- The U.S. Safe Drinking Water Act Tier 3 violations, where:
  - Tier 3 violations are defined according to 40 CFR 141.201 as those violations of the NPDWR not included in Tier 1 and Tier 2 that require public notice but are not considered to have a direct impact on human health (e.g., failing to take a required sample on time).

Note to **IF0103-07**

.37 The registrant shall discuss notable violations such as EPA Tier 1 events, those that affected a significant number of customers, or those of extended duration.

.38 For such violations, the registrant should provide:

- Description and cause of the violation;
- The population affected by the disruption;
- The costs (in U.S. dollars) associated with resolving the violation;
- Actions taken to mitigate potential for future violations; and
- Any other significant outcomes (e.g., legal proceedings, related fatalities).

IF0103-08. Amount of legal and regulatory fines and settlements associated with drinking water contamination

.39 The registrant shall disclose the amount (excluding legal fees) of all fines or settlements associated with drinking water contamination, such as those related to enforcement of U.S. laws and regulations on drinking water treatment, source protection, operator training, and public disclosure of contamination events, including violations of the U.S. Safe Drinking Water Act and the European Drinking Water Directive, among others.

.40 Disclosure shall include civil actions (e.g., civil judgment, settlements, or regulatory penalties) and criminal actions (e.g., criminal judgment, penalties, or restitutions) taken by any entity (government, businesses, or individuals).

Note to **IF0103-08**

.41 The registrant shall briefly describe the nature (e.g., guilty plea, deferred agreement, or non-prosecution agreement) and context (e.g., maximum contaminant level (MCL), maximum residual distribution level (MRDL), treatment technique (TT), etc.) of fines and settlements.

.42 The registrant shall describe any corrective actions it has implemented as a result of each incident. This may include, but is not limited to, specific changes in drinking water treatment, management, training, or public communication.

IF0103-09. Discussion of strategies to manage drinking water contaminants of emerging concern

.43 The registrant shall discuss its strategy and approach to managing drinking water contaminants that are not subject to regulation at the present time but may be of emerging human health and/or environmental concern to the public, regulators, and/or others (e.g., non-governmental organizations, scientific researchers, etc.), where:

- Drinking water contaminants of emerging concern include, but are not limited to, residuals of pharmaceuticals, personal care products, pesticides, detergents, hormones, and other compounds, including those that disrupt the endocrine system.

.44 At a minimum, the registrant shall discuss the actions it takes to assesses drinking water contaminants for hazard characteristics, risk traits, and treatment processes and strategies it employs to manage such hazards and risks.

.45 Relevant actions to discuss include the practices employed to determine and monitor contaminants of emerging concern, including a discussion of the contaminants of emerging concern that are currently being monitored, whether such contaminants are included in the Environmental Protection Agency's (EPA) Contaminant Candidate List 3 (CCL3), any thresholds the registrant may have developed for acceptable concentrations of such contaminants, and engagement in partnerships or initiatives to address contaminants of emerging concern, such as engagement in the EPA's Unregulated Contaminant Monitoring Program.

.46 Relevant drinking water treatment processes and strategies include, but are not limited to, conventional drinking water treatment and advanced drinking water treatment technologies, such as granular activated carbon, ozonation, ultraviolet disinfection, membrane treatment, and/or investments in research and development of treatment technologies or methods for emerging contaminants.

.47 The registrant shall discuss the risks and/or opportunities associated with the potential for emerging contaminants to come under drinking water regulations.

- Relevant information to provide includes, but is not limited to:
  - Identification of the emerging contaminants most likely to come under regulation;
  - Current ability to treat and/or manage such contaminants; and
  - Risks (e.g., potential for fines) and opportunities (e.g., potential for infrastructure expansions to be covered by rates).

Fair Pricing & Access

Description

Reliable access to clean water is commonly viewed as a basic human right. Pricing that communities perceive to be fair and affordable is a component of this right. As a result, structuring water rates in a manner that the community perceives as fair is critical to the value of water utility companies. Companies that are able to work with regulators to implement rate structures that increase levels of community acceptance are likely to find greater opportunities in the U.S. and around the world—especially in light of the underfunded nature of water infrastructure, where private capital can play a role. Inadequate access to water and pricing that is perceived as unfair can create risk of de-privatization.

Accounting Metrics

IF0103-10. Number of formal customer complaints regarding pricing of and/or access to water received, percentage withdrawn

.48 The registrant shall disclose the number of formal customer complaints it received during the fiscal year regarding its prices structures and/or access to and availability of its water supply.

.49 Formal customer complaints shall be considered as those instances in which customers have brought forth a complaint that involves an evidentiary proceeding before a public utility commission (PUC) administrative law judge (ALJ) or other PUC moderator, which may be available through public databases such as:

- A database of formal customer complaints made to the Pennsylvania PUC is available here.
- A database of formal proceedings overseen by the California PUC is available here.
- A listing of consumer complaints made to the New York Department of Public Services is available here.

.50 The registrant shall calculate the percentage of formal customer complaints withdrawn as the total number of customer complaints that were withdrawn divided by the total number of customer complaints it received, where:

- Withdrawn complaints are defined as those complaints that were withdrawn by the customer or dismissed by the PUC or ALJ.

.51 The registrant should disclose any complaints made during the prior period and withdrawn during the current period as well as complaints made during the current period that are not resolved at the date of reporting.

IF0103-11. (1) Drinking water and (2) sanitation coverage rates for population served in developing countries

.52 The registrant shall disclose the drinking water and wastewater coverage rates for the population served by its operations in developing countries, where:

- Developing countries are defined, consistent with the World Bank definition, as countries in which the majority live on far less money, with far fewer basic public services, than the population in highly industrialized countries, including those countries that are considered Heavily Indebted Poor Countries (HIPC), Middle-Income Countries (MIC), Low-Income Countries Under Stress (LICUS), and Small States by the World Bank.
    - The registrant should consider such guidance as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

.53 Drinking water coverage rates shall be calculated as the number of people to whom the utility delivers access to safe drinking water divided by the total population covered by the registrant's operations, where:

- Safe drinking water is defined, consistent with the United Nations (U.N.) Millennium Development Goal (MDG) 7, as water with microbial, chemical, and physical characteristics that meet World Health Organization (WHO) Guidelines for Drinking-water Quality or the relevant national standards for drinking water quality.

- Access is defined, consistent with the U.N. MDG 7, as having a source that is less than one kilometer away from its place of use where it is possible to reliably obtain at least 20 liters of water per person per day.

- The population covered by the registrant's operations includes the total population of the registrant's service area and is not limited to the registrant's current customer base.

.54 Sanitation coverage rates shall be calculated as the number of people to whom the utility delivers, at a minimum, basic sanitation services divided by the total population covered by the registrant's operations, where:

- Basic sanitation is defined, consistent with U.N. MDG 7, as ensuring hygienic excreta and sullage disposal and a clean and healthful living environment, where examples of appropriate facilities include, but are not limited to, public sewer connections, septic system connections, pour-flush latrines, simple pit latrines, and ventilated improved pit latrines.

.55 The scope of disclosure includes the registrant's operations where it maintains responsibility for the delivery and infrastructure developments of drinking water and wastewater treatment services.

.56 Relevant agreements within the scope of this disclosure, consistent with the World Bank's Types of Public-Private Partnership Agreements, include, but are not limited to:

- Lease and affermage contracts (limited to those instances where the registrant is responsible for collecting additional surcharges from customers to fund investments in infrastructure)
- Concessions, Build-Operate-Transfer (BOT), and Design-Build-Operate (DBO) contracts
- Joint venture contracts
- Privatization contracts

.57 The registrant may choose to disclose how drinking water and sanitation rates vary based on the form of contract employed.

IF0103-12. Discussion of how considerations of fair pricing and access are integrated into determinations of rate structures

.58 The registrant shall discuss how considerations of fair pricing and access are integrated into the development and design of the rate structure determination for the registrant's market-based and regulated operations.

.59 The registrant shall discuss whether it considers the effects of rate structures on water pricing and consumer access, including whether the development of rate structures occurs through rate cases made to a public utility commission, contract negotiations, or other rate-setting mechanisms and whether such practice takes place in developed markets or emerging markets.

.60 The registrant shall discuss the basic framework of the various rate structures (e.g., increasing block rates, seasonal rates, water surcharges, uniform rate structure, flat-fee rates, etc.) it employs or is subject to, the number of customers associated with each rate structure, how rate structures may vary between emerging market and developed economies, and how the rate structure affects the registrants ability to deliver fair prices and access to its customers.

.61 Relevant rate structure implications on fair pricing and access include, but are not limited to, constraints on or allowances for the registrant's ability to deliver assistance to low-income customers, expand and maintain infrastructure, and implement water conservation strategies.

Downstream Water Efficiency

Description

Water and wastewater companies develop, maintain, and operate complex interconnected infrastructure networks. Water entering the distribution network as raw water undergoes a treatment process to reach a certain water quality level. Significant volumes of treated water are lost in the distribution network because of infrastructure failures—primarily, leaking pipes and service connections. An additional component of downstream water efficiency is how utilities work with regulators to reduce risk and increase long-term success in the context of the increasing need for resource efficiency. Water efficiency and conservation are prevalent themes in water utility rate-making, especially in water-scarce regions.

Accounting Metrics

IF0103-13. Water pipe replacement rate

.62 The registrant shall disclose its water pipe replacement rate for the distribution network(s) that it owns and/or operates.

.63 The registrant shall calculate the water pipe replacement rate as the total length (in kilometers) of pipe replaced during the fiscal year divided by the total length (in kilometers) of water pipes in its distribution network.

Note to **IF0103-13**

.64 The registrant shall discuss its strategies and challenges regarding the replacement of water pipes.

.65 Relevant strategies to discuss include, but are not limited to, assessment of pipe integrity, maintenance and repair of existing pipes, and rate cases to support pipe replacement.

.66 Relevant challenges to discuss include, but are not limited to, the impacts of pipe materials (e.g., cast iron, ductile iron, polyvinyl chloride, etc.), ability to finance replacement through rates, and the age of the current distribution network.

IF0103-14. (1) Customer water savings from efficiency measures and (2) percentage of regulatory savings requirement achieved

.67 The registrant shall disclose the total volume of water savings (in cubic meters) from water efficiency measures installed or otherwise supported by the registrant during the fiscal year.

.68 Water savings shall be defined as the difference between the actual amount of water consumption and that which would have been consumed had efficiency measures not been installed.

.69 Water savings shall be calculated according to the state or local evaluation, measurement, and verification (EM&V) regulations where such savings occur. Relevant regulations include, but are not limited to:

- California Public Utilities Commission Decision 07-12-050

.70 Where state or local regulations do not exist, the registrant shall calculate water savings consistent with the measurement and verification methods outlined by Efficiency Valuation Organization's *International Performance Measurement and Verification Protocol: Concepts and Options for Determining Energy and Water Savings, Volume 1* (2012).

.71 The registrant shall not include water savings achieved during previous fiscal years in its calculation of customer water savings from efficiency measures, including where state regulations allow for such carryforward.

.72 The percentage of regulatory savings achieved shall be calculated as those customer water savings (in cubic meters from efficiency measures delivered to meet regulatory water savings requirements plus any such savings carried forward (as allowed by regulations) from prior periods, divided by the total amount of water savings from efficiency measures required to be delivered by regulations. Relevant regulations include, but are not limited to:

- The California Water Conservation Act of 2009

.73 The registrant shall consider such guidance as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

.74 The registrant shall not include savings achieved, during the fiscal year, that exceed those required by regulations in its calculation of the percentage of savings required by regulations.

.75 The registrant should disclose instances in which it has not been able to deliver a sufficient amount of water savings as required by regulations, including a disclosure of the amount of savings delivered subject to the regulation and the amount of savings required by the regulation

.76 The registrant may choose to disclose any water savings delivered that exceed those required by regulations that resulted in the registrant receiving rewards from water efficiency performance incentives.

IF0103-15. Volume of non-revenue real water losses

.77 The registrant shall disclose the amount, in cubic meters, of water unaccounted for due to real losses from the distribution system, where:

- Real losses are defined, consistent with the American Water Works Association Water Audit Method, as volumes lost through leaks, breaks and overflows on mains, service reservoirs, and service connections, up to the point of customer metering.

.78 The registrant shall calculate the amount of real losses according to federal, state, or local regulations or voluntary initiatives where such loss occurs. Relevant guidance includes, but is not limited to:

- California Senate Bill 555
- Texas Water Code Section 16.012
- Georgia Senate Bill 370
- The American Water Works Association M36 Manual

.79 The registrant should disclose the technique(s) it employs to measure non-revenue water from real losses and the amount calculated according to each technique it employs.

.80 The registrant may choose to disclose voluntary initiatives, such as the EPA's WaterSense program, that it has engaged in to manage non-revenue water from real losses.

Network Resiliency & Impacts of Climate Change

Description

Water supply and wastewater disposal are basic services for which maintaining continuity is of utmost importance. The increasing frequency and severity of storms challenge water and wastewater treatment facilities and can affect the continuity of service. Intense precipitation may lead to sewage volumes that exceed the capacity of treatment facilities and result in release of untreated effluent. Salt water intrusion, forest fires and other natural events can impact the quality of water source. Additionally, there may be system failures that impact continuity of service. Minimizing current and future risks of service disruptions can require additional capital expenditure and operational expenses. Companies that address these risks through redundancies and strategic planning will be better able to serve customers and protect shareholder value.

Accounting Metrics

IF0103-16. Water treatment capacity located in FEMA Special Flood Hazard Areas or foreign equivalent

.81 The registrant shall disclose the capacity, in cubic meters per day, of its water treatments facilities that are located in special flood hazard areas, where:

- FEMA Special Flood Hazard Areas (SFHA) are defined as land areas covered by the floodwaters of the base flood on National Flood Insurance Program (NFIP) maps. An SFHA is an area where the NFIP's floodplain management regulations must be enforced and where the mandatory purchase of flood insurance applies. SFHAs include Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V. Examples of Special Flood Hazard Areas include coastal floodplains, floodplains along major rivers, and areas subject to flooding from ponding in low-lying areas.

- The scope of disclosure includes U.S.-based facilities that are designated by FEMA as SFHAs, as well as non-U.S.-based facilities.

- For non-U.S.-based facilities that fall outside of the scope of FEMA, the foreign equivalent is an area that will be inundated by a flood event that has a one-percent chance of being equaled or exceeded in any given year (i.e., the 100-year floodplain).

IF0103-17. Volume of sanitary sewer overflows (SSO), percentage recovered

.82 The registrant shall disclose the number and volume, in cubic meters, of sanitary sewer overflows (SSO), originating from sewer systems under the registrant's operational control, where:

- SSOs are defined, consistent with the Sewage Overflow Community Right-To-Know Act as those overflows, spills, releases, or diversions of wastewater from a sanitary sewer system.

.83 The registrant shall report the percentage recovered as the volume, in cubic meters, of sewage discharged to the environment that was recovered divided by the total amount of sewage discharged to the environment through SSOs, where.

- The recovered volume is defined as the amount of sewage discharged that was captured and returned to the sanitary sewer system or private lateral or collection system.

.84 Relevant state databases listing SSOs include, but are not limited to:

- Maryland Reported Sewer Overflow Database
- California SSO Incident Map
- Michigan Event Discharge Information

.85 The registrant should discuss programs and initiatives, including those programs overseen by state and local governments and those developed internally by the registrant, that it is involved in to reduce the number and volume of SSOs and its efforts to mitigate any such occurrences.

IF0103-18. (1) Number of service interruptions, (2) population affected, and (3) average duration

.86 The registrant shall disclose the number of interruptions to its drinking water supply services, the total population affected by such interruptions, and the average duration of an interruption, where:

- A service interruption is defined as those incidents of complete water shutoff, low flow restrictions, boil water advisory, and water main flushing, and excludes those incidents where a reduction of service occurs but normal activities (dishwashing, showering, laundry washing, toilet flushing etc.,) are maintained.
- The total population affected is defined as those people who experienced service interruptions.
- The average duration of an interruption shall be calculated as the total duration (in minutes) of service interruptions divided by the number of service interruptions.

.87 The registrant may choose to disclose the number of interruptions that were intentionally planned or scheduled by the registrant, the size of the population affected, and the duration of those interruptions.

Note to **IF0103-18**

.88 The registrant shall discuss notable service interruptions such as those that affected a significant population or those of extended duration.

.89 For such interruptions, the registrant should provide:

- Description and cause of the service interruption;
- The costs (in U.S. dollars) associated with the service interruption;

- Actions taken to mitigate the potential for future service interruptions; and

- Any other significant outcomes (e.g., legal proceedings, related fatalities).

IF0103-19. Discussion of efforts to identify and manage risks and opportunities related to the impact of climate change on distribution network

.90 The registrant shall discuss its efforts to identify and manage risks and opportunities associated with the impact of climate change on the distribution network, where:

- Risks include, among others, threats to the registrant's physical infrastructure as a consequence of climate change related events (e.g., rising sea levels, increasing storm intensity, and impacts of drought) that could result in service disruption(s).

- Opportunities include the need for infrastructure improvements within the registrant's current service area and the opportunity to expand its service area through privatization of municipal water infrastructure.

.91 The registrant shall describe how it identifies and prioritizes the potential for risks to, and vulnerabilities of, its distribution network.

- Relevant risks and vulnerabilities to discuss include, but are not limited to, those relating to the age, geographic location, and physical qualities of the registrant's distribution infrastructure.

.92 The registrant shall describe its efforts to manage the risks and opportunities associated with its distribution network including, but not limited to, infrastructure development, current storm tracking, global gridded climate models, and the use of redundant systems to assure service continuity.

.93 The registrant may choose to discuss its efforts to manage risks and opportunities associated with its distribution network in the context of the rate case and rate making political environment, including the effects on the registrant's ability to expand, maintain, and enhance the resiliency of its distribution network.

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