Economic Impact Assessment of Proposed Updates to the Water Diversion and Use and Water Measurement and Reporting Regulations

July 2025

1. SUMMARY

California's Water Measurement and Reporting Regulation (chapter 2.8 of title 23 of the California Code of Regulations), often referred to SB 88 regulation, requires many diverters to measure and report the amount of water they divert. The State Water Resources Control Board ("Water Board") is proposing to revise the SB 88 regulation to improve the quality and usability of the data submitted under the regulation, as well as to improve the overall clarity of the text. The revisions are based on feedback from existing diverters and reporters, after substantial outreach and engagement over the previous two years.[1]

The proposed SB 88 regulation update is anticipated to improve the accuracy, consistency, and usability of water diversion data, which is essential for effective water management, particularly during droughts. By clarifying terms, simplifying requirements, and standardizing data formats, the update will help streamline reporting for water right holders and make data analysis more efficient for the Water Board. These changes are expected to promote a more transparent, flexible, and responsive water management framework, and reduce some of the compliance costs to water right holders, though specific cost savings could not be quantified in this economic impact assessment due to existing data limitations.

The proposed update to the SB 88 regulation introduces some new requirements that can directly affect water right holders. The proposed update will potentially impact water right holders' reporting costs as well as expenses related to new measurement and recording equipment. As shown in Table 1, the proposed update is estimated to have a one-time cost impact of approximately $4.7 million, plus an annual cost impact of approximately $470,000.[2] About half of the one-time cost is associated with reporting requirements, and the other half with the need for new measuring and recording devices. Most of the recurring costs are associated with maintenance and operation of the new devices.

[1] Additionally, the Water Board is also proposing minor revisions to the Appropriation of Water and the Water Diversion and Use Reports regulations (chapters 2 and 2.7 of title 23 of the California Code of Regulations).

[2] One-time cost impacts estimated in this economic impact assessment most likely will not be incurred in any 12 consecutive months after the proposed update to the SB 88 regulation is effective. Rather, one-time cost impacts probably will be incurred over several years after the effective date. The expected effective date of the proposed update is October 2025. Measurement requirements will begin in October 2025, while reporting requirements will begin between October 2026 and January 2027. For a specific subset of diverters, both measuring and reporting requirements will start in October 2026. Therefore, the proposed update is expected to be fully implemented by early 2027, or approximately two and a half years from its effective date. However, to account for the likelihood that one-time costs may be distributed over multiple years, a conservative five-year timeframe is assumed for calculating the present discounted value (PDV) of the estimated costs. The PDV of the total estimated costs (both one-time and recurring costs) is estimated to range from $6,682,907 to $6,799,359 over that time frame, depending on the discount rate used (3 to 5 percent, which reflects the relevant range for economic impact analyses in the industry). All prices and costs in this assessment are in constant 2024 dollars.

Table 1
Estimated costs for water right holders

	Cost ($)	
Cost Type	**One-time**	**Recurring**
Reporting	2,210,017	96,664
Equipment installation and maintenance	2,458,064	368,710
Total	**4,668,081**	**465,374**

Note: Cost estimates in the table include fiscal impacts on state and local governments. In this and subsequent tables, "Recurring" costs include: (a) estimated annual costs incurred by water right holders after the proposed regulation becomes effective (e.g., annual operation and maintenance of measuring devices, as explained in Section 4.2), and (b) estimated initial costs sustained in subsequent years as additional water right holders begin to incur these costs (e.g., the cost of submitting an annual report with measurement data, as explained Sections 2.1 and 4.1).

The proposed SB 88 regulation update is anticipated to have a negligible impact on California's economy. Although some diverters may increase capital expenditure to purchase new measurement and recording equipment, this change is not expected to significantly affect production levels or lead to increased investment across the state. Likewise, existing manufacturers and service providers for measurement and recording equipment would not require expansion, so new businesses in these sectors are unlikely to emerge, nor are existing businesses expected to close. Job creation or elimination is also not expected as a result of the proposed update. Additionally, while the update relies on established technologies and is not expected to drive major innovation, future support for integration with the CalWATRS platform may lead to some technological developments.

2. INTRODUCTION

2.1. Baseline

The Water Measurement and Reporting Regulation, effective since 2016, requires many diverters to measure and report the amount of water they divert. These regulations established, for the first time, formal requirements to meter or measure certain diversions and report that data to the Water Board. In general, this applies to those who divert more than ten acre-feet per year. This includes diverters who have:

- A single water right with a face value or historical use (whichever is greater) of more than ten acre-feet per year;
- Multiple water rights that share a point of diversion and have a combined face value or historical use of more than ten acre-feet per year;
- Multiple water rights that share a place of use and have a combined face value or historical use of more than ten acre-feet per year;[3]

[3] The proposed update to the SB 88 regulation eliminates applicability criteria based on shared places of use. This change may potentially exclude previously subject water rights from measuring and reporting diversions. Due to a lack of compliance data, comprehensive place of use data, and other data, it is not possible to identify the water rights that are subject to existing regulation based solely on a shared place of use. As a result, this economic impact assessment does not account for shared places of use. Therefore, the potential cost savings of the proposed update, as described in the following sections of this economic impact assessment, are likely underestimated.

- Multiple water rights that divert to the same reservoir or pond and have a combined face value or historical use of more than ten acre-feet per year.[4]

Diverters must measure their diversions monthly, weekly, daily, or hourly, depending on the type and size of the diversion. In general, diverters only need to submit their measurement data to the Water Board once per year, though larger diverters are required to provide measurement data on a weekly basis.[5] Data is submitted as an attachment to the Annual Water Diversion and Use Reports. Diverters who fail to measure and report their diversions could be subject to fines and other penalties.

Table 2 summarizes the six years of available water rights data (water years 2018–2023):

- Number of water rights subject to the SB 88 regulation that were included in this economic impact assessment: 11,500;[6]
- Average number of water rights for which Annual Water Diversion and Use Reports (annual reports) were submitted:10,400 per year (90 percent of 11,500);
- Average number of water rights for which annual reports were submitted and measurement data (datafiles) was attached: 2,300 per year (20 percent of 11,500);
- Average number of water rights for which annual reports were submitted but measurement data was not attached: 8,100 per year (71 percent of 11,500);
- Average number of water rights for which annual reports were submitted but measurement data was not attached, and that had water diversions greater than zero: 5,600 per year (49 percent of 11,500);
- Average number of water rights for which annual reports were submitted but measurement data was not attached, and that had water diversions greater than zero and that had measuring devices: 2,300 per year (20 percent of 11,500);
- Average number of water rights for which annual reports were submitted but measurement data was not attached, and that had no water diversions: 2,500 per year (22 percent of 11,500).

The number of water rights for which annual reports were submitted with attached measurement data showed considerable variation from year to year. But, *on average*, the number of water rights that attached measurement data increased by about 100 per year from water year 2018 to 2023, which corresponds to an *average* annual rate of increase of approximately 4.3 percent.

[4] The proposed update to the SB 88 regulation will reduce measurement requirements for reservoirs with storage capacities of 5,000 acre-feet or less, regardless of the face value or historical use of the associated water right(s). This change will potentially exclude up to approximately 1,100 reservoirs from requirements to measure and report reservoir withdrawals and releases. Due to a lack of compliance data and other data, it is not possible to exclude these reservoirs from this economic impact assessment. As a result, the potential costs of the proposed update, as described in the following sections of this assessment, are likely overestimated.

[5] In the existing regulation, diverters who divert more than 10,000 acre-feet per year or 30 cubic feet per second between June and September, or who have a reservoir with a capacity of at least 10,000 acre-feet, must post measurement data to a public website at least once per week.

[6] Approximately 500 water rights that are held by the federal government were excluded from this analysis, as the scope of this economic impact assessment is limited to State and local governments, and private diverters. Water rights that are in the Legal Delta also were excluded from this analysis, as many of these rights collect measurement data under an alternative compliance plan (“Delta ACP”) that provides the Water Board with measurement data without the submission of datafiles, and many others in the Legal Delta are working on individual ACPs with a similar strategy. The proposed update to the SB 88 regulation is not expected to affect those diverters.

Table 2
Average number of water rights subject to SB 88 regulation in water years 2018–2023

Annual Report Submitted	SB 88 Datafile Submitted	Water Diverted during Year	Measurement Device	Annual Average Number of Water Rights Subject to SB 88	
yes	yes	-	yes	2,258	(20%)
yes	no	yes	yes	2,264	(20%)
yes	no	yes	no	3,328	(29%)
yes	no	no	NA	2,523	(22%)
no	no	NA	NA	1,109	(10%)
				11,482	**(100%)**

Note: Table includes water rights for which annual reports were submitted within six months of the established due date and excludes water rights held by the federal government and water rights in the Legal Delta. Total numbers and percentages in this and subsequent tables may not add up due to rounding. "NA" means data was not available. The symbol "-" in the first row indicates that for some water rights water was diverted, while for others no water was diverted.

Of the 11,500 water rights subject to the SB 88 regulation that were included in this economic impact assessment, approximately 9,900 water rights (86 percent) are held by private diverters, 200 (2 percent) by the state government, and 1,400 (12 percent) by local governments. The impact of the proposed SB 88 regulation update on each of these three groups is analyzed separately in this assessment.

The new California Water Accounting, Tracking, and Reporting System online reporting platform ("CalWATRS") is expected to replace the current reporting system in 2025, and sustain the improvement in baseline compliance observed in the past years. CalWATRS will better inform diverters of their measuring and data reporting requirements during the reporting process, and it will also allow staff to flag mistakes with submitted reports and send notifications to diverters directly. These changes might benefit, in particular, diverters who do not know that they are subject to the SB 88 regulation, and diverters who have measuring devices but do not know that they must upload a datafile with measurement data.

CalWATRS is expected to come into operation independently of the implementation of the proposed update to the SB 88 regulation, and, therefore, is treated in this analysis as part of the baseline. Taking CalWATRS implementation into consideration, this economic impact assessment assumes that, absent the proposed SB 88 regulation update, the number of water rights for which annual reports are submitted with measurement data would continue to increase, *on average*, at the same average rate observed from water year 2018 to 2023, i.e., by approximately 4.3 percent per year. This assumption allows the number of water rights for which annual reports are submitted with measurement data to vary from one year to another, and thus is consistent with the observed historical pattern.

2.2. Proposed Regulation

The proposed update to the SB 88 regulation improves clarity and organization of the existing regulatory text and makes minimal changes to current requirements. The main changes, mostly affecting current reporting requirements, are:

- Rediversions: diverters will be required to identify and report rediversions already being measured; diverters may be required, upon request, to measure rediversions and report them as such.[7]
- Email accounts: water right holders will be required to provide an email for their CalWATRS account.[8]
- Data template: diverters will be required to use a template provided by the Water Board to report measurement data or transmit data directly to the Water Board's online reporting platform (CalWATRS).
- Large diversion submissions: diverters who are subject to the large diversion requirements will need to submit their data to CalWATRS instead of posting to any public website.[9]
- Large diversion applicability: diverters allowed to divert more than 30 cubic feet per second ("cfs") of water at any time during the year will be subject to the large diversion requirements.[10]
- Point of measurement: diverters will be required to identify and report their measurement location.
- Measurement methodology: diverters will be required to file a measurement methodology form describing how they are measuring and accounting for diversions.

Overall, the proposed update to the SB 88 regulation is not expected to affect the baseline number of water rights that are subject to the SB 88 regulation or the baseline number of these water rights that submit annual reports to the Water Board (Table 2). However, diverters who have measuring devices but still do not submit the necessary datafiles with their annual reports might be more likely to do so as a result of the proposed update. Taking that potential effect into account, this economic impact assessment assumes that the number of water rights for which annual reports are submitted with measurement data will increase at a slightly greater average rate than the expected 4.3 percent for the baseline. More specifically, because the increase in the number of water rights with measurement data is projected to be driven mostly by water right holders that may still be getting accustomed to the initial regulation adopted eight years ago, the impact of the proposed update on the number of water rights that submit measurement data is projected to be nonzero, but still an order of magnitude smaller than the projected baseline increase (i.e., greater than zero but less than one percent).[11]

Additionally, as a result of the proposed SB 88 regulation update, some diverters likely will need to install measuring and recording devices, including at points of rediversion or to satisfy large diversion requirements. These impacts are discussed in detail in Section 4.

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[7] Rediverted water refers to water that has previously been diverted or stored from a watercourse or storage location where the previously diverted or stored water has been comingled with water available for diversion under other claimed water rights.

[8] This requirement affects water right holders more generally and not just the subset of water right holders subject to the SB 88 regulation.

[9] Currently, this is referred to as the "telemetry requirement" although the existing regulation misuses the term to instead refer to more frequent submission of data. The proposed update replaces the term "telemetry requirements" with "large diversion requirements" to better reflect the nature of the requirements.

[10] As mentioned before, currently, diverters are subject to these requirements if they are allowed to divert more than 10,000 acre-feet of water per year, have a reservoir with 10,000 acre-feet or more of capacity, or are allowed to divert more than 30 cfs of water at any time between June and September. The new large diversion applicability will, in addition, include diverters who are allowed to divert more than 30 cfs of water at any time during the entire year.

[11] The mid-point of 0.5 percent is assumed for subsequent calculations in this economic impact assessment. Estimated cost impacts would not significantly differ if other values in that range were assumed.

3. BENEFITS

The proposed SB 88 regulation update is expected to yield benefits that are not possible to quantify given the existing data. The proposed update aims to enhance the accuracy, consistency, and usability of reported data, which is crucial for effective water management, especially in drought conditions. By restructuring the regulation for clarity, simplifying requirements, and standardizing data formats, the proposed update will make it easier for water right holders to comply and for the Water Board to analyze the data systematically.

More specifically, the proposed update clarifies key terms, like “measuring device,” and more explicitly requires labelling of points of rediversion and identification of measurement locations. These changes are expected to reduce reporting confusion and prevent data inconsistencies. The addition of exemption criteria for those who did not divert and expanded eligibility for alternative compliance plans will introduce flexibility for diverters, easing compliance burdens while ensuring that necessary data is captured. Aligning reporting requirements with the water year and mandating email addresses for digital reporting will further streamline processes, supporting a more transparent and responsive water management framework in California. By clarifying and streamlining reporting processes, taken together these changes are expected to reduce some of the compliance costs for water right holders. These cost savings were not quantified in this economic impact assessment because of data limitations. More specifically, the cost savings associated with greater understanding of requirements may vary greatly between water right holders and cannot be easily quantified. The benefits from improvements in water rights administration and statewide water management also are difficult to assign a value to, because they depend on future decisions and conditions that cannot be accurately forecasted.

4. DIRECT COSTS

4.1. Reporting Costs

As explained in Section 2.2, the proposed update to the SB 88 regulation will revise some of the current reporting requirements that could have an economic impact on diverters. More specifically, when reporting, diverters will be required to (1) provide information on rediversions (if requested by the Water Board), (2) provide an email address for their CalWATRS account, (3) submit their measurement data using a specified datafile format or template in CalWATRS, (4) submit their large diversion submissions to CalWATRS (if subject to the large diversion requirements), (5) identify their measurement location, and (6) file a measurement methodology form describing how they are measuring and accounting for diversions.

The table below summarizes the impact on reporting costs for private water right holders (reporting costs for state and local governments are analyzed separately in Section 6). As shown in the table, private water right holders combined will potentially experience a one-time reporting cost of approximately $1.5 million and subsequent annual reporting costs of approximately $56,000 as a result of the proposed SB 88 regulation update.

Table 3
Reporting costs for private water right holders

	Cost ($)	
Reporting-related Task	**One-time**	**Recurring**
Rediversion	0	17,967
Email account	77,678	0
Measurement data template	413,721	20,047
Large diversion requirements	529,304	0
Measurement location	201,964	2,506
Measurement methodology	310,298	15,035
Total	**1,532,975**	**55,555**

Water rediversion is an important metric for accounting for the total amount of water diverted and used, and many diverters are already measuring and reporting rediversions.[12] These diverters would be required to indicate, to the extent possible, the amount of water rediverted in submitted measurement data. The amount of time needed to submit the information about a rediversion would vary and is expected to be, on average, two hours every year, per point of rediversion ("PoRD"). Assuming an hourly rate of $121.40, which is based on the 2024 median hourly wage of a mechanical engineer in California multiplied by a factor of two to account for benefits and overhead,[13] the cost of reporting the required information to the Water Board would be approximately $243 per PoRD per year ($121.40/hour × 2 hours). It is projected that private diverters would be asked to report information for approximately 74 PoRDs every year.[14] Thus, the total reporting cost of this requirement, as shown in Table 3, would be about $18,000 per year ($243/PoRD × 74 PoRDs) for private diverters. Some of the diverters would additionally need to install measuring devices to measure rediversions – the installation and maintenance costs of such devices are discussed in Section 4.2.

Most water right holders, approximately 90 percent, have already provided an email address to the Water Board and, therefore, would not incur any additional cost to comply with the email requirement for a CalWATRS account. It is assumed that the remaining water right holders would have to create an email account and submit it to the Water Board. The amount of time needed to do so would vary and is expected to be, on average, 30 minutes per water right holder.[15] It is projected that approximately 1,280 private water right holders (ten percent of 12,797) would need to create an email account and report it to CalWATRS.[16] Thus, assuming as before an hourly rate of $121.40, the total reporting cost of this requirement, as shown in the table above, would be approximately $77,700 for private water right holders.

The amount of time needed to submit measurement data in the template designed by the Water Board would vary and is expected to be, on average, two hours per water right. This average

[12] Diverters may already be measuring rediversions specifically, or they may be measuring a combination of rediversions, diversions to storage, and/or direct diversions that occur at the same point of diversion.

[13] Other occupations such as civil engineer, environmental engineer, or engineering technician could also have been assumed in this economic impact assessment. The assumption that the tasks will be performed by a mechanical engineer potentially over-estimates the costs of the tasks.

[14] This projection relies on an analysis of (1) rediversions for which data are already available and (2) rediversions for which data are still lacking and that are projected to be requested in the future based on watershed and ownership. This analysis also has data limitations, as the current reporting system does not have comprehensive data on rediversions.

[15] This 30-minute average also accounts for the potential instances in which internet is not readily available to a water right holder. The number of water right holders without internet access is estimated to be minimal.

[16] 12,797 is the number of private water right holders who have filed an annual report in the past five years. Thus, it includes, but is not limited to, private water right holders subject to the SB 88 regulation.

accounts for the instances in which a water right is associated with multiple points of diversion.[17] The average also accounts for both diverters who are already providing measurement data to the Water Board, as well as diverters who have not submitted datafiles before, but are projected to start doing so in the next years. While the former group of diverters will likely spend less than two hours on average to update their datafiles to conform with the template, the latter (and smaller) group will probably need approximately two hours on average to create a datafile conforming to the template and upload it. Among private diverters, it is estimated that approximately 1,704 water rights already submitting datafiles would conform to the template in the first year after the proposed regulation is effective, and another 83 water rights would start submitting datafiles conforming to the template every year afterwards. Therefore, assuming as before an hourly rate of $121.40, the total reporting cost of the template requirement for private diverters would be an initial $413,700 plus approximately $20,000 every year.

The amount of time needed to comply with the large diversion requirement that data be submitted to CalWATRS would depend on, among other factors, whether the diverter is already reporting to a public website in accordance with the existing telemetry requirements. For the large diversion requirements, diverters may either submit measurement data in a template provided in CalWATRS, or they may connect their measurement and reporting equipment to transmit measurement data directly to CalWATRS. Based on current data submission rates for the existing telemetry requirements, it is expected that most diverters will opt to connect their devices to CalWATRS. If the diverter is already reporting to a public website, the amount of time needed to adjust that process to submit to CalWATRS is estimated to be, on average, eight hours per water right.[18] If the diverter is not currently telemetering to a public website, then the amount of time needed to set up a connection to CalWATRS is estimated to be, on average, 16 hours per water right. These averages account for the instances in which a water right is associated with multiple points of diversion and therefore multiple devices. Notably, the amount of time needed to transmit data to CalWATRS will likely decline over the years, as device manufacturers start supporting CalWATRS integration in the future.[19] Among private diverters, it is estimated that 321 water rights are already telemetering to public websites and an additional 112 would be setting up these connections or uploading large diversion datafile templates for the first time. Therefore, assuming an hourly rate of $121.40, the total reporting cost of this requirement for private diverters would be approximately $529,300. Some of the 112 diverters would additionally need appropriate measuring and recording devices – the installation and maintenance costs of such devices are discussed in Section 4.2.

Diverters will be able to identify their measurement location in CalWATRS by zooming in on a map and clicking the appropriate location. The amount of time needed to do that would vary and is expected to be, on average, 15 minutes per water right. This average accounts for the instances in which a water right is associated with multiple points of diversion. Among private diverters, it is estimated that approximately 6,700 water rights (those already submitting annual reports with measurement data to the Water Board, as well as those with diversions greater than zero that are submitting annual reports without measurement data) would identify their measurement locations in the first year after the proposed regulation is effective, and an additional 83 water rights would start doing so every year afterwards (those that will start submitting measurement data to the Board). Therefore, assuming an hourly rate of $121.40, the total reporting cost of this requirement for private diverters would be an initial $202,000 plus approximately $2,500 every year.

The amount of time needed to describe the existing measurement methodology being used by the diverter and to file the measurement methodology form with the Water Board would vary and is

[17] There are approximately 1.4 points of diversion per water right in the dataset analyzed in this economic impact assessment.

[18] A highly experienced professional, already familiar with the equipment, reporting system, and CalWATRS, could probably set it up in as little as two hours (including testing).

[19] Several manufacturers have participated in the CalWATRS development with the Water Board.

expected to be, on average, 1.5 hours per water right. This estimate accounts for the potential time spent on describing calculations, conversions, and quality assurance protocols, through which the diverter accounts for the volume and flow rate of water diverted under each water right. Among private diverters, it is estimated that approximately 1,704 water rights already submitting datafiles would additionally file the measurement methodology form in the first year after the proposed regulation is effective, and another 83 water rights would start submitting such forms every year afterwards. Therefore, assuming as before an hourly rate of $121.40, the total reporting cost of the measurement methodology requirement for private diverters would be an initial $310,300 plus approximately $15,000 every year.

4.2. Equipment Installation and Maintenance Costs

As mentioned in the previous section, some of the diverters will need certain equipment in order to be able to comply with the new rediversion and large diversion requirements. Table 4 summarizes the impact of these requirements on equipment installation, operation, and maintenance costs for private diverters (equipment installation and maintenance costs for state and local governments are analyzed separately in Section 5). As shown in the table, private diverters will potentially experience (one-time) equipment installation costs of approximately $637,000 and subsequent annual maintenance costs of approximately $96,000 as a result of the proposed SB 88 regulation update.

Table 4
Equipment installation and maintenance costs for private water right holders

	Cost ($)	
Equipment-related Task	**One-time**	**Recurring**
Measuring device installation (rediversion requirement)	297,602	0
Measuring device maintenance (rediversion requirement)	0	44,640
Telemetry-capable recording device installation	339,150	0
Telemetry-capable recording device maintenance	0	50,873
Total	**636,752**	**95,513**

The installation cost of a new measuring device is case-specific and thus can vary widely. For large diversions (direct diversions of 10,000 acre-feet/year or more), the installation cost can range from $13,500 to $26,200 per device, and includes the costs of an open channel flow device, pressure transducer, staff gauge, data logger recording device, and telemetry.[20] Telemetry is not a required feature for measuring large diversions, but will generally be desired based on the frequency at which diverters are required to collect and submit measurement data. Often rediversions occur and are already being measured at a point of direct diversion or diversion to storage, in which case the diverter would need to account for the rediversion but an additional measuring device would not be necessary. If necessary, and by request, other diverters may need to install an additional measuring device for points of rediversions that are not already being measured. Most of the diverters that are projected to need new measuring devices for points of rediversion have diversions greater than 10,000 acre-feet/year, and, therefore, would likely incur installation costs in that price range. The mid-point of that range, approximately $19,840/PoRD, was thus assumed as the potential installation cost incurred by diverters projected to need new measuring devices at their points of

[20] Installation, maintenance, and operating costs of a new measuring device were obtained from Table 3 in the appendix to the STD. 399 form for the “Measurement & Reporting on the Diversion of Water” emergency regulation. These cost estimates were adjusted for inflation based on California’s consumer price index obtained from the Department of Finance.

rediversion. Among private diverters, about 15 points of rediversion are projected to need new measuring devices, and would thus incur total installation costs of approximately $297,600, as shown in the table above.

Following industry standards, it was assumed that the annual cost of operation and maintenance of the measuring device would be equal to 15 percent of the cost of installing a new device. Thus, the total cost incurred by the 15 private diverters to operate and maintain new measuring devices for measuring rediversions would be approximately $44,600 per year.

Like measuring devices, the installation cost of a new recording device for transmitting large diversion data is case-specific and can vary widely. It depends, for example, on the type of transmission and the frequency and volume of transmission that diverters choose to do.[21] The installation cost of these devices can range from $3,500 (e.g., out-of-the-box cellular chips, transmission of daily measurements of a few parameters, one-year cellular plan) to $5,000 (e.g., use of satellite or radio if cellular reception is not reliable). The mid-point of that range, $4,250/device, or approximately $5,950/water right, was thus assumed as the potential installation cost incurred by diverters projected to need new devices. Among private diverters, approximately 57 water rights are projected to need new recording devices for transmitting large diversion data, and would thus incur total installation costs of approximately $399,200, as shown in Table 4.

Following industry standards, it was assumed as before that the annual cost of operation and maintenance of the telemetry-capable recording device would be equal to 15 percent of the cost of installing a new device. Thus, the total cost to operate and maintain new devices associated with the 57 water rights would be approximately $50,900 per year.

5. COST IMPACT ON BUSINESSES AND INDIVIDUALS

5.1. Typical and Small Businesses

To assess the cost impact on typical and small regulated businesses (all regulated businesses are private water right holders), approximately 9,900 water rights held by private diverters were analyzed. The volume of water allowed to be diverted for a water right varies significantly, ranging from 10 acre-feet per year to more than 500,000 acre-feet per year. The median water right among private diverters, in terms of volume allowed to be diverted, is approximately 100 acre-feet per year, and the fifth percentile is approximately 14 acre-feet per year. The median number of water rights held by private diverters is one. The “typical” water right holder in this economic impact assessment is, therefore, defined as holding approximately one water right for an allowed diversion volume of 100 acre-feet per year, and the “small” water right holder is defined as holding one water right for a diversion volume of 14 acre-feet of water or less per year.[22]

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[21] Because of the utility of telemetering devices for diverters subject to the large diversion requirements, the calculations in this economic impact assessment assume diverters will install and maintain telemetry-capable recording devices, even though these devices are not strictly required.

[22] In general, the fifth percentile is a common statistical measure to identify the lower end of a distribution, providing a clear and quantifiable threshold. In this assessment, the choice of the fifth percentile is a representative measure of small water right holders, and the results would remain consistent even if a different percentile in the bottom end of the distribution were chosen. This is because: (1) the number of water rights held by diverters in these lower percentiles is always one, and (2) the volumes allowed to be diverted in these lower percentiles are generally small and do not vary significantly. For example, whether we choose the first, fifth, tenth, or even twentieth percentile, the number of water rights held by a diverter would still be one, and the volumes allowed to be diverted would still be considered small in the context of the industry. Thus, like the diverters under the fifth percentile, diverters under other percentiles in the lower end of the distribution would

The small and typical water right holders thus defined likely will not be affected by the rediversion and large diversion requirements – as explained in Section 4.2, water right holders that will likely need new measurement or recording devices are some of the largest diverters. The remaining requirements, i.e., the ones related to the new reporting tasks described in Section 4.1, are projected to have some impact on small and typical water right holders.

Table 5 shows the cost impact on a small or typical water right holder, based on the unit costs discussed before, including the assumed hourly rate of $121.40. Both small and typical water right holders are expected to incur a one-time cost of approximately $516 (per business on average), which accounts for the time needed to provide an email address for their CalWATRS account, submit their measurement data using a template provided by the Water Board or CalWATRS, identify their measurement location, and file a measurement methodology form describing how they are measuring and accounting for diversions, discussed previously.

Table 5
Cost impact on a typical or small private water right holder

Reporting-related Task	Cost ($)
Email account	61
Measurement data template	243
Measurement location	30
Measurement methodology	182
Total	**516**

5.2. Individuals

It is likely that some of the private diverters discussed in the previous section are individuals and not businesses. However, it is not possible to distinguish between individuals and businesses with the available data. For that reason, it is assumed that, like small and typical regulated businesses, most of the individuals holding water rights and subject to the SB 88 regulation would only incur the reporting-related costs of $516 (per individual on average), but not the costs related to new measuring and recording devices.

6. FISCAL IMPACTS

6.1. Local Governments

As stated before, approximately 12 percent, or 1,400, of the 11,500 water rights subject to the SB 88 regulation are held by local government agencies. The cost impact of the proposed SB 88 regulation update on this group of water rights is analyzed separately in this section, but is based on the same assumptions and calculations described in Section 4 for private water right holders.

Table 6 summarizes the impact on reporting costs for local government agencies. Combined, they will potentially experience a one-time reporting cost of approximately $635,600 and subsequent

only incur the reporting-related cost, but not the costs associated with new measuring or recording devices. Therefore, our analysis of impact on small water right holders remains robust regardless of the exact percentile chosen, as long as it represents the lower end of the distribution. By using the fifth percentile – a common statistical measure to identify the lower end of a distribution – our definition reliably captures the general characteristics of the smallest segment of water right holders relevant to this assessment. Note that the volume of water diverted might not always correlate with the size of the business in terms of employees or financial receipts. However, in the absence of data on the business characteristics of water right holders, using the volume of water allowed to be diverted as a proxy for “small” businesses is the most reasonable approach.

annual reporting costs of approximately $41,000 as a result of the proposed SB 88 regulation update.

Table 6
Reporting costs for local governments

	Cost ($)	
Reporting-related Task	**One-time**	**Recurring**
Rediversion	0	28,893
Email account	3,223	0
Measurement data template	130,384	6,318
Large diversion requirements	371,970	0
Measurement location	32,222	790
Measurement methodology	97,788	4,738
Total	**635,586**	**40,739**

As before, it assumed that the amount of time needed to submit the information about rediversions would be, on average, two hours every year. Additionally, it is projected that local government agencies would be asked to report information for approximately 119 rediversions every year. Thus, assuming an hourly rate of $121.40, the total reporting cost of this requirement would be about $28,900 per year.

It is projected that approximately 53 local government agencies would need to create an email account and report it to CalWATRS,[23] and that the amount of time needed to do so would be, on average, 30 minutes per agency. Thus, assuming an hourly rate of $121.40, the total reporting cost of this requirement, as shown in the table above, would be approximately $3,200 for local government agencies.

The amount of time needed to submit measurement data in the template designed by the Water Board would be, on average, two hours per water right. Among local government agencies, it is projected that approximately 537 water rights already submitting datafiles would conform to the Board-provided data template in the first year after the proposed regulation is effective, and another 26 water rights would start submitting datafiles conforming to the template every year afterwards. Therefore, the total reporting cost of the template requirement for local government agencies would be an initial $130,400 plus approximately $6,300 every year.

As explained in Section 4.1, the amount of time needed to comply with the large diversion requirement that data be submitted to CalWATRS is estimated to be either eight or 16 hours per water right, depending on whether the diverter is already reporting to a public website in accordance with the existing telemetry requirements. Among local government agencies, it is estimated that 319 water rights are already telemetering to public websites and an additional 32 would be telemetering for the first time, with the same assumption discussed in Section 4 that diverters subject to the large diversion requirements will opt for telemetry-capable recording devices. Therefore, the total reporting cost of this requirement for local government agencies would be approximately $372,000.

The amount of time to identify measurement locations in CalWATRS is expected to be, on average, 15 minutes per water right. Among local government agencies, it is estimated that approximately 1,100 water rights would identify their measurement locations in the first year after the proposed regulation is effective, and an additional 26 water rights would start doing so every year afterwards.

[23] More precisely, the number of local government agencies that would need to create an email account is projected to be 53.1, and not 53 as shown in the text. This same approach (of showing rounded numbers in the text) was taken throughout the document for clarity, and does not affect the results of this economic impact assessment.

Therefore, the total reporting cost of this requirement for local government agencies would be an initial $32,200 plus approximately $800 every year.

The amount of time needed to describe the existing measurement methodology being used and to file the measurement methodology form with the Water Board is expected to be, on average, 1.5 hours per water right. Among local government agencies, it is estimated that approximately 537 water rights already submitting datafiles would additionally file the measurement methodology form in the first year after the proposed regulation is effective, and another 26 water rights would start submitting such forms every year afterwards. Therefore, the total reporting cost of the measurement methodology requirement for local government agencies would be an initial $97,800 plus approximately $4,700 every year.

Table 7 summarizes the impact of the new rediversion and large diversion requirements on equipment installation, operation, and maintenance costs for local government agencies. Combined, they will potentially experience (one-time) equipment installation costs of approximately $1.8 million and subsequent annual maintenance costs of approximately $270,000 as a result of the proposed SB 88 regulation update.

Table 7
Equipment installation and maintenance costs for local governments

	Cost ($)	
Equipment-related Task	**One-time**	**Recurring**
Measuring device installation (rediversion requirement)	1,785,612	0
Measuring device maintenance (rediversion requirement)	0	267,842
Telemetry-capable recording device installation	11,900	0
Telemetry-capable recording device maintenance	0	1,785
Total	**1,797,512**	**269,627**

As explained in Section 4.2, the installation cost incurred by diverters projected to need new measuring devices at their points of rediversion is assumed to be approximately $19,840/PoRD. Among local governments, about 90 points of rediversion are projected to need new measuring devices, and would thus incur total installation costs of approximately $1,786,000, as shown in Table 7, and subsequent operating and maintenance costs (15 percent of installation costs) of approximately $267,800 per year.[24]

The installation cost of a new telemetry-capable recording device is estimated to be approximately $5,950/water right. Among local government agencies, approximately two water rights are projected to need new devices, and would thus incur total installation costs of approximately $11,900, and subsequent operating and maintenance costs (15 percent of installation costs) of approximately $1,800 per year.

[24] Total installation costs of new measuring devices at PoRDs likely are over-estimated in this economic impact assessment, as many of these PoRDs might already have the necessary infrastructure in place. Similarly, maintenance costs at PoRDs are potentially over-estimated in this assessment, as many already have ongoing maintenance, oversight, and tracking.

6.2. State Government

Approximately two percent, or 200, of the 11,500 water rights subject to the SB 88 regulation are held by state government agencies. The cost impact of the proposed SB 88 regulation update on this group of water rights is analyzed separately in this section, but is based on the same assumptions and calculations described in Section 4 for private water right holders.

Likely, state agencies will not be as impacted as private water right holders and local government agencies in aggregate. Table 8 summarizes the impact on reporting costs for state agencies. Combined, they will potentially experience a one-time reporting cost of approximately $41,500 and subsequent annual reporting costs of approximately $400 as a result of the proposed SB 88 regulation update.

Table 8
Reporting costs for state government

	Cost ($)	
Reporting-related Task	**One-time**	**Recurring**
Rediversion	0	0
Email account	140	0
Measurement data template	4,087	198
Large diversion requirement	30,107	0
Measurement location	4,057	25
Measurement methodology	3,065	149
Total	**41,456**	**371**

It is projected that likely no state agency would be asked to report new rediversion information to the Water Board, and thus would not incur any costs related to this new requirement.[25]

It is projected that potentially two or three state agencies would need to create an email account and report it to CalWATRS, and that the amount of time needed to do so would be, on average, 30 minutes per agency. Thus, assuming an hourly rate of $121.40, the total reporting cost of this requirement, as shown in the table above, would be approximately $140 for the state agencies.

The amount of time needed to submit measurement data in the template designed by the Water Board would be, on average, two hours per water right. Among state agencies, it is projected that approximately 17 water rights already submitting datafiles would conform to the Board-provided data template in the first year after the proposed regulation is effective, and one additional water right would start submitting datafiles conforming to the template every year afterwards. Therefore, the total reporting cost of the template requirement for state agencies would be an initial $4,100 plus approximately $200 every year.

The amount of time needed to comply with the large diversion requirement that data be submitted to CalWATRS is estimated to be either eight or 16 hours per water right, depending on whether the diverter is already reporting to a public website. Among state agencies, it is estimated that 17 water rights are already telemetering to public websites and an additional seven water rights would be telemetering for the first time, with the same assumption discussed before that diverters subject to the large diversion requirements will opt for telemetry-capable recording devices. Therefore, the total reporting cost of this requirement for state agencies would be approximately $30,100.

The amount of time to identify measurement locations in CalWATRS is expected to be, on average, 15 minutes per water right. Among state agencies, it is estimated that approximately 134 water

[25] No state agency rights were listed as having a point of rediversion in the data analyzed in this economic impact assessment.

rights would identify their measurement locations in the first year after the proposed regulation is effective, and one additional water right would start doing so every year afterwards. Therefore, the total reporting cost of this requirement for state agencies would be an initial $4,100 plus approximately $30 every year.

The amount of time needed to describe the existing measurement methodology being used and to file the measurement methodology form with the Water Board is expected to be, on average, 1.5 hours per water right. Among state agencies, it is estimated that approximately 17 water rights already submitting datafiles would additionally file the measurement methodology form in the first year after the proposed regulation is effective, and one additional water right would start submitting such form every year afterwards. Therefore, the total reporting cost of the measurement methodology requirement for state agencies would be an initial $3,100 plus approximately $150 every year.

Table 9 summarizes the impact of the new rediversion and large diversion requirements on equipment installation, operation, and maintenance costs for state agencies. Combined, they will potentially experience (one-time) equipment installation costs of approximately $23,800 and subsequent annual maintenance costs of approximately $3,600 as a result of the proposed SB 88 regulation update. Given that no state agency is expected to report new rediversion information, these costs refer to the installation, operation, and maintenance of telemetry-capable recording devices.

Table 9
Equipment installation and maintenance costs for state government

	Cost ($)	
Equipment-related Task	**One-time**	**Recurring**
Measuring device installation (rediversion requirement)	0	0
Measuring device maintenance (rediversion requirement)	0	0
Telemetry-capable recording device installation	23,800	0
Telemetry-capable recording device maintenance	0	3,570
Total	**23,800**	**3,570**

The installation cost of a new telemetry-capable recording device is estimated to be approximately $5,950/water right. Among state agencies, approximately four water rights are projected to need new devices, and would thus incur total installation costs of approximately $23,800, and subsequent operating and maintenance costs (15 percent of installation costs) of approximately $3,600 per year.

7. ECONOMY-WIDE IMPACTS

The impact of the proposed SB 88 regulation update on the state economy is projected to be negligible. More specifically:

- **Investment in the state**: As explained in previous sections, the proposed update is expected to increase capital expenditure through the purchase of new measurement and recording equipment by some of the diverters. This increased capital expenditure, however, is relatively negligible, and thus not sufficiently large to affect production levels of existing in-state manufacturers of flow meters, gauges, telemetry-

capable recording devices, and related equipment. Therefore, no significant increase in investment is expected statewide.

- **Creation of new businesses or elimination of existing businesses**: Existing manufacturers of measurement and recording equipment likely would not need to expand production as a result of the proposed SB 88 regulation update. Similarly, businesses that provide support, maintenance, and repair of such equipment would not experience any notable expansion. Likewise, engineering consulting firms, contractors, and related businesses that assist diverters with the reporting requirements and measurement data management would not experience any notable expansion. Accordingly, it is unlikely that new businesses in these manufacturing or service sectors will be created in the state. No existing business is expected to be eliminated as a result of the proposed SB 88 regulation update.
- **Creation or elimination of jobs within the state**: For the reasons explained in the previous bullet points, it is unlikely that jobs will be created or eliminated within the state as a result of the proposed update.
- **Competitive advantages or disadvantages for businesses**: The proposed SB 88 regulation update would not put in-state businesses at a disadvantage.
- **Incentives for innovation in products, materials, or processes**: The SB 88 regulation and proposed update rely on available and well-established measurement and recording technologies. As noted in Section 4.1, an increasing number of telemetry-capable recording device manufacturers will potentially start supporting integration with CalWATRS in the coming years, which could be seen as an innovation. However, the overall impact of the proposed update on innovation in products, materials, or processes likely will be negligible.

8. ALTERNATIVES

Two alternatives to the proposed SB 88 regulation update were evaluated in this economic impact assessment. Like the proposed update, the two alternatives improve clarity and organization of the existing regulatory text. However, the first alternative (“Alternative 1”) considers only two of the requirements proposed in the SB 88 regulation update: (a) water right holders would be required to provide an email for their CalWATRS account, and (b) diverters would be required to use a Water Board template to report measurement data or transmit data directly to CalWATRS. Alternative 1 is, therefore, less stringent than the proposed SB 88 regulation update. The second alternative (“Alternative 2”) considers all the requirements proposed in the SB 88 regulation update and makes one of them relatively more stringent: all rediversions (and not only those requested by the Water Board) would be required to be measured and reported as such. Alternative 2 is, therefore, more stringent than the proposed SB 88 regulation update.

The analysis of cost impact of the two alternatives is based on the same assumptions and calculations described in Section 4. Table 10 below summarizes the estimated cost impact of Alternatives 1 and 2, as well as the estimated cost impact of the proposed SB 88 regulation update for comparison. For simplicity, the cost estimates shown in the table include potential fiscal impacts. Under Alternative 1, water right holders would incur one-time costs of approximately $630,000, plus annual costs of approximately $27,000, that reflect the time needed to comply with the email and data template requirements. Water right holders under this alternative would not incur any costs related to equipment installation and maintenance. Under Alternative 2, water right holders would incur one-time costs of approximately $6.1 million, plus annual costs of approximately $700,000. Compared to the proposed update, diverters under this alternative would have to report a greater

number of rediversions and install more measuring devices, and, therefore, incur higher reporting, installation, and maintenance costs in aggregate.

Table 10
Estimated costs for water right holders under Alternative 1, the proposed SB 88 regulation update, and Alternative 2

	Cost ($)	
Alternatives and Proposed Update	**One-time**	**Recurring**
Alternative 1	629,243	26,562
Proposed SB 88 regulation update	4,668,081	465,374
Alternative 2	6,076,731	693,910

Note: Cost estimates in the table include fiscal impacts on state and local governments.

9. REFERENCES

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